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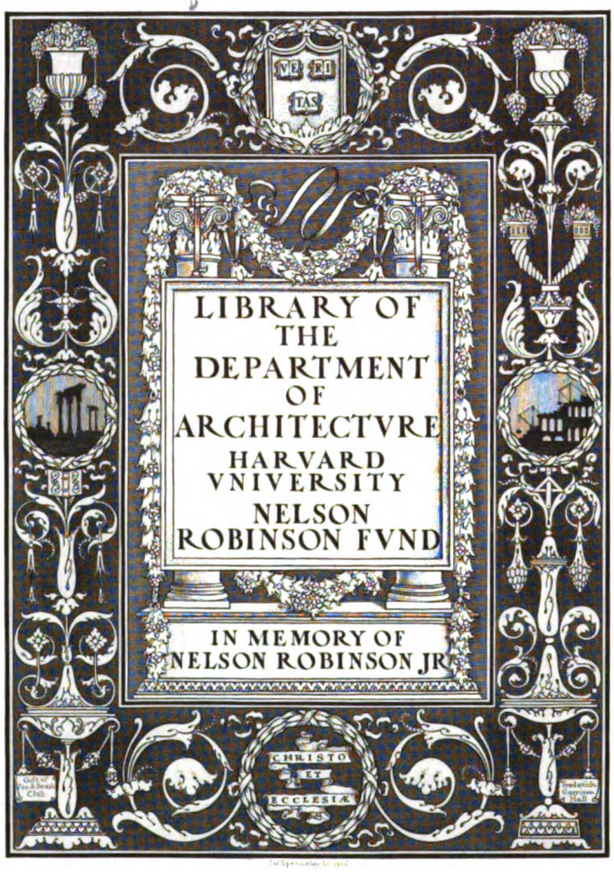

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CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

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THE BUILDER

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The Registration Question and the Institute.

THE general meeting of the Institute of Architects on Monday next, the following three resolutions are to be proposed:—

"1. That this Institute is in favour of the general principle of the compulsory examination and registration of architects.

2. That a committee be appointed to consider what steps should be taken to give effect to this principle, and to report thereon to a special general meeting before the opening of Parliament.

3. To nominate this committee."

We regard this as a very unfortunate commencement of the new year in the architectural world. It may be observed that the movement is essentially a provincial one. One London architect, Mr. G. A. T. Middleton, is included among those bringing forward the resolutions; he, as our readers are probably aware, has from the first been closely connected with a society which was formed for the avowed purpose of promoting the registration of architects, and which has over and over again brought forward unsuccessfully a Bill in Parliament to attain that end. The other promoters of the resolutions are the Presidents of the Leeds and Yorkshire Architectural Society, the Manchester Society of Architects, the Liverpool Architectural Society, and two other gentlemen who represent respectively the Cardiff, South Wales, and Monmouthshire Architects' Society, and the York Architectural Society. This is, therefore, in fact, a movement to impose upon the central society a principle which the leading London architects are known to disapprove of, at the bidding of the provincial architects, and by a vote in which numbers will count more than names.

Of course we have no intention of casting any slight upon provincial architects as such; we have every reason for the contrary feeling; nor, in any case, are they unanimous on this question, since we know of provincial architects who are coming to the meeting on purpose to vote against the resolutions. But in the first place, it can hardly be denied that most of the leading and most gifted architects of the day are to be found among the London fraternity, and genius and position ought to count more than numbers; in the second place, a large proportion of provincial architects are carrying on practice under conditions which naturally lead them to attach a good deal of importance to what may be called the business side of architecture. They have not the large practice and consequent emoluments which a London architect who is at all successful can secure, and they think that their more modest income is further curtailed by the builder or auctioneer who calls himself "architect."

The feeling is natural and excusable—*oportet vivere;* but it is not taking a very high view of the objects of the architectural profession. Nor do we believe that registration would make any practical difference in the case. The builder would still act as an architect for the kind of

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people who are content with that sort of practitioner; he would only be precluded from using the ornamental title. There are those, however, who profess to think that they are going to raise the status of the architect by making the use of the title unlawful except under legal sanction. Our impression is that this demand for registration will only be regarded by the most discerning portion of the public as a confession of weakness.

The question has been raised whether architecture is an art or a profession, to which the almost inevitable answer in the present day is that it is both. Taking it as an art, it may be compared in that sense with sculpture. Any eminent sculptor who passes along Euston-road may see there, as well as in many other parts of the town, the announcement "sculptor" over the shops of mere carvers, who could not produce sculpture in the highest sense of the word; and the carver puts the same word on his trade cards. But we have never heard that Mr. Brock or Mr. Gilbert have thought of applying for a legal injunction to restrain these men from using the word "sculptor," or are haunted by any idea that their position is endangered by the fact. Then take architecture as a profession, and compare it with engineering, which is a pure profession, entirely unadulterated with art. On that account registration might be far more easily and simply applied to engineering than to architecture, since an engineer's required knowledge is of the kind which really can be tested by examination; and if it is argued that registration of architects is a necessity for the safety of the public, it is far more implicitly so in the case of engineering, which deals with larger and more complicated structural work, on which more lives depend. Yet the engineers have never made any demand for registration; like the sculptors, they do not seem troubled by the fact that gas-fitters and other such persons take on them the title of "engineer"; they have succeeded in making it necessary that every engineer who aspires to a good position should become a member of the Institution of Civil Engineers; that is sufficient for them, and that is accepted by the public as a sufficient guarantee.

This is so because the engineers are a united body. All that is necessary for architects and for the public is that there should be the same general recognition of the Institute of Architects as a body to which every architect of good standing should belong. This is only prevented by the unfortunate differences and cliques in the architectural profession; and it is rather curious to reflect that while the few eminent architects who refuse to belong to the Institute are those who are most opposed to registration, it is exactly by their aloof position that the Institute is weakened in its opposition to registration. It is the Institute which would stand between them and registration, if they gave it their support, which, with a very short-sighted policy, the motives of which are mysterious, they have refused. If the movement on Monday is successful, it will be to a great extent, though indirectly, their fault.

Whatever may be the result of the voting on Monday evening, we have no doubt of two things—first, that the men who regard architecture mainly as a business will vote for the resolutions, while the majority of those who regard it mainly as an art will vote against them. Secondly, that if they are passed, a step will have been made towards reducing architecture to a business, and the Institute to a trade union, which it was never intended to be. The Institute of Architects was founded "for the advancement of architecture," an end which will not be furthered by any Registration Act.

THE RECENT EXCAVATIONS IN THE FORUM ROMANUM, 1898–1903.

By MR. THOMAS ASHBY, JUNR., OF THE BRITISH SCHOOL AT ROME.

THE extensive excavations which have been going on during the last few years in the Forum, and which will, in all probability, be continued for several years more, have sprung from relatively small beginnings. A small committee was appointed in 1898 to examine and classify the architectural fragments which had been discovered in the course of previous excavations, but which had not been arranged in any order, and were often some way removed from the buildings to which they really belonged. The completion of this work would, it was thought, make it possible to restore any buildings of which there were sufficient remains to make reconstruction certain. But before the work had gone very far it became clear that further excavation was urgently necessary before it would be possible to proceed to reconstructions which would have any chance of being correct. In fact, Professor Lanciani had only in the previous year ("Ruins and Excavations of Ancient Rome," p. 240) written as follows: "It is necessary to remind the reader that the excavations of the Forum and of the Palatine have nowhere been carried to the proper depth. We have satisfied ourselves with laying bare the remains of the *late* Empire, without taking care to explore the earlier and deeper strata."

Compare the *Journal of the Royal Institute of British Architects*, series iii., vol. viii., No. 2, p. 25: "Former excavations, including those in which I have had a personal share since 1870, have always stopped at the higher level of ruins. As soon as the pavement of a street, of a house, of a public building was exposed to view we were asked to stop, without being able to ascertain whether under those structures of the late Empire there were deeper and older strata of even greater archæological interest."

The result was that, in the first period, little was done in the way of rebuilding beyond the re-erection of two of the columns which stood upon the row of seven brick bases opposite to the Basilica Julia, and of the epistyle of the small shrine at the entrance to the Atrium Vestæ. Attention was turned to excavation, which almost at once produced results of surprising interest. The discovery of the "lapis niger" in January, 1899, aroused general attention, and ever since that time the work has been carried on without intermission. Comm. Giacomo Boni has been in charge from the first, and has shown unwearying energy and perseverance. The work is carried on with great thoroughness, and the exploration does not stop until the undisturbed strata have been reached. If there is any complaint that can legitimately be made it is this, that the official reports and plans of the excavations are somewhat slow in appearing. Considering the world-wide interest which they excite, more might be done to satisfy the natural curiosity of scholars and to render the ruins easier to study. Those foreigners who are fortunate enough to be able to watch their progress have not the knowledge of details which would permit them to attempt in any way to anticipate the reports in the *Notizie degli Scavi*; nor, indeed, would it be etiquette for them to do so.

I cannot hope on the present occasion to give more than a general account of what has been done; those who desire to study the subject in more detail may be referred* to the *Notizie degli Scavi* and the *Bullettino Comunale* (both since 1898 *passim*), to a very useful article of Professor Hülsen's in the *Römische Mittheilungen*, 1902, p. 1 *sqq.*, to frequent "Notes from Rome," by Professor Lanciani, in the *Athenæum*, and to a series of short papers by the present writer in the *Classical Review*.

It will perhaps be best to begin our survey at the north-west end of the Forum, just below the Capitol. Some slight traces of the *podium*, or solid base, of an earlier temple of Saturn have been discovered, and also the remains of a drain which ran beneath the flight of steps which ascended to it. In front of the Temple of Concord a whole network of drains, of various ages and types and at various levels, has been unearthed. This space was known as the *Area Volcani*, and here is the primitive altar of Vulcan, from which it took its name—a roughly squared mass of natural tufa rock, about 13 ft. by 9½ ft. by 4 ft. high. The south-east edge of the *Area Volcani*, which was paved with chips of red tufa rammed hard, is marked by a step and a gutter, both in blocks of tufa.

The problem of the Rostra now claims attention. The Rostra of the Republic are to be found close to the inscribed stele, of which more will be said later. But a row of eight small arched chambers, a little to the west of the altar of Vulcan, has been supposed by Signor Boni to be the Rostra of Julius Cæsar, to whom the change in the position of the Rostra is attributable. This view has, however, not been generally accepted; from the style of their construction (in *opus incertum* coated with coarse white cement) it is probable that they belong to a considerably earlier date, and are simply the support of the Clivus Capitolinus. The very latest theory on the subject is that of Professor Otto Richter. Behind the rectangular structure, which is generally known as the Rostra of Cæsar, there is a curved mass of concrete about 80 Roman feet in length, faced with slabs of *porta santa* marble, which are divided by pilasters of *africano* marble. This was supposed by Nichols

* No attempt is, naturally, made to give a complete bibliography; the literature of the subject is already assuming considerable proportions.

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to have been the Græcostasis of the period just before Julius Cæsar; but Richter's view, that it was later in date than the Rostra in front of it, had been generally, though not universally, accepted. He has finally, however, acknowledged the justice of Nichols' view as to the relative date of the two structures, and now inclines to suppose that the curved one (generally spoken of as the "hemicycle," though it is really only about one-sixth of a circle) is the Rostra of Julius Cæsar, the rectangular structure being attributable to Trojan or Hadrian.

One great objection seems to be that the available space on the highest point of the "hemicycle" (which is approached by steps from behind) is almost too narrow; the platform of the Rostra would only have been 6½ ft. in depth. But the subject requires further consideration.

At the south-west end of the "hemicycle" the foundations of the Schola Xantha and of the Arch of Tiberius have been discovered; but from an architectural point of view they call for no remark, except that it is noticeable that this arch (like some other Roman triumphal arches) was not erected across a road, and was not traversable except by foot passengers.

Excavations round the Arch of Septimius Severus (to which, in its original condition the same remark applies) have revealed remains of early structures in red tufa, and have shown that, contrary to what is normally the case in Rome, the level of the ground was lowered in the fourth century A.D., when the equestrian statue of Flavius Julius Constantinus was erected.

Not far from the Arch of Severus a group of monuments has been discovered, which surpass in interest any that the present excavations have brought to light. First in importance, and in date also, according to the latest writer upon the subject,* is the inscribed stele, which has already become famous, and been the subject of many articles and much discussion—the net result of which seems to be that, although it is legible enough, the Latin is so much more archaic than any other specimens that we have that only one word of it can be made out with any degree of certainty, and that is *recei* (the dative of *rex*); but we have Mommsen's authority for saying that the reference is not, as had generally been supposed, to the ritual representative of the regal office in Republican times, but to a real king—though a protest must be entered against the assumption that any proof is thereby given of the credibility of the traditional history of Rome. The most "revolutionary" critics never denied (in fact, they emphatically stated) that the constitutional history of Rome presupposed the existence of *kings*, and the inscription has given us, so far, no further information in regard to them than we possessed before.

Next in order of date follows a low platform approached by steps, which was probably the Rostra of Republican days, and after that come the remains of an erection of the nature of an altar (possibly the centre of the cult of the dead Romulus), which has a different orientation.

The "tomb of Romulus," which presupposes the existence of this altar, by which its back side is masked, corresponds in the form in which we see it with the description of what was still visible in the last century B.C.—a shrine guarded by two statues of recumbent (?) lions, the bases of the pedestals of which, with their simple base moulding, have been discovered. These are attributed by Professor Studniczka to the beginning of the fourth century B.C. Above, and differently orientated, is a pavement of slabs of black marble, connected with the pavement of the Comitium of the time of Julius Cæsar, but which has probably been relaid, having been originally placed there some time earlier, in connection with the pavement of the Republican Comitium.

The Comitium (the space in front of the Senate House, originally used for assemblies of the citizens) has been explored down to the untouched soil, and many different strata have been distinguished—among the lower of these a layer of roof tiles, which probably date from a period just anterior to the invasion of the Gauls, being the débris of buildings destroyed by them.

We next come to the Basilica Æmilia, which occupied the whole of the north-east side of the Forum proper—an immense building, with a south-west façade nearly 360 ft. in length, which consisted of massive pilasters of blocks of white marble, supporting arches of 17½ ft. span.

At the south corner there was a kind of projecting porch of one intercolumniation; whether a similar structure existed at the north-west end of the façade cannot be determined, as the north corner of the building has been much destroyed and modified. It is further noticeable that the north-west side was not at right angles to the south-west side, but was skewed in order to make it parallel to the side of the Curia, which has a different orientation. The central nave had a breadth of 39⅓ ft., with an aisle on each side 16⅓ ft. in width; its length has not yet been determined, as the building is not completely excavated. It had two orders of columns of *africano* marble, with Corinthian capitals of white marble. The pavement, of fine slabs of marble, is still well preserved, and is remarkable for the thousands of molten bronze coins which were found upon it. The whole building, in fact, bears clear traces of destruction by fire; but it has further been ransacked in the Middle Ages by seekers for building materials, and, though we have sufficient architectural fragments to be able to form some idea of its magnificence (the beauty of the ornamental details in the cornices and friezes is most remarkable), the condition in which the building was found was unexpectedly disappointing.

It is worthy of notice that any deductions with regard to the technique of early Roman masonry which have been drawn from the construction of the Cloaca Maxima must be treated with caution. What has hitherto been attributed to the period of the Kings* is only the third in date. It passes under the Argiletum (the street between the Curia and the Basilica Æmilia), then runs parallel to the façade of the latter for some way, then turns southward to cross the area of the Forum. At the point where it turns, a cloaca, which runs under the basilica at right angles to its axis, falls into it; and this in turn blocks up an even earlier cloaca, which runs obliquely beneath the basilica, and which has not been traced for any distance as yet.

Beneath the central area of the Forum a network of subterranean galleries has been discovered, which, as Comm. Boni supposes, served for the storage of "properties" in connection with the games and shows held in the Forum; there has also come to light a large concrete base, which perhaps supported the equestrian statue of Domitian described by Statius.

Not far from the Basilica Æmilia, just to the south-east of the temple of Antoninus and Faustina, the prehistoric necropolis, of which so much has been heard of late, has been discovered. These tombs so far identified (though not all of them have been as yet explored) are twenty-one in number. The older interments are those which contain cremated ashes; these are, as a rule, placed in an urn—often a hut urn of the usual Latin type—which, with several smaller pots, is enclosed in a large dolium with a stone cover, which is itself placed in a round hole dug in the ground, and covered with the ashes from the funeral pyre and a small heap of lumps of tufa. In the later inhumation burials the body of the deceased is placed in a rectangular trench (several of them are tombs of infants, who were buried within a portion of the trunk of an oak), and with it pottery, which begins to show traces of Greek influence; whereas that in the cremation tombs is purely Latin, resembling as closely as possible that which is found in the cemeteries of the Alban Hills and upon the Esquiline.

The necropolis belongs, without doubt, to the inhabitants of one of the neighbouring hills—in all probability the Palatine—and must date from a very early period in the history of Rome. Very full reports will be found in the official publications.

Close to this cemetery is a building which has been labelled as a prison by its discoverer, but a difficulty has to be dealt with. No ancient author mentions the existence of a prison in this place, which is in itself a strong argument against the identification; and the idea that this series of small chambers on each side of a narrow passage, each with its door sunk partly below ground level and lighted by a small window, served as strong rooms for the jewellers who had their shops on the Sacra Via, seems to have more in its favour.

We now ascend south-eastwards, towards the Arch of Titus; and here the recent excavations have disclosed the pavement of the Sacra Via of the early Imperial period, winding up the slope of the Velia and flanked by buildings on each side. The steps of the Temple of Venus and Rome are actually built upon it, so that the erection of this building must have led to a change in its course. It is not *necessary* to suppose that the

* Professor Fr. Studniczka, in *Jahreshefte des Oesterr. Arch. Inst.*, vi. (1903), pp. 129 *sqq.*

* My remarks apply only to the portion which crosses the Forum; the rest has not been investigated in the light of recent discoveries.

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Arch of Titus ever spanned this road; but it is not probable that it occupied its present position when the road was in use, as its concrete foundations rest upon the pavement of a road which runs from the Sacra Via up to the Palatine, and which is about 7 ft. below the top of the foundations on the north-east side. Either, therefore, it was moved by Hadrian when he built the temple, or the earlier Sacra Via which we now see was abolished (in part, at any rate) when the arch was built.

The Convent of S. Francesca Romana, which is built upon the remains of the Temple of Venus and Rome, is now being restored, and its fine fifteenth century cloister brought to light. When the work is completed, it will be used as a museum to contain the objects found in the Forum excavations.

We may now retrace our steps, and examine the buildings on the south-west side of the Sacra Via.

The Atrium Vestæ has been further investigated, and much has been learnt of the plan of the earlier Atrium which underlies the building as restored in the time of Septimius Severus. This earlier building was (like many others which have been recently discovered) orientated according to the points of the compass. It is, in fact, not impossible that the Forum of the early Republic ran from north to south—from the Comitium towards the north-east corner of the Palatine; but the question is too complicated to be discussed here.

The Temple of Vesta and the Regia have both been further investigated, and various points of interest in regard to their architectural history have come to light. A very full and well-illustrated report on the former will be found in the *Notizie degli Scavi*, 1900, p. 159 *sqq.*

Another group of remains of great interest lies between the Atrium Vestæ and the Temple of Castor. I refer to the spring of Juturna and the buildings connected with it.* The spring was at first made to rise in a large basin paved with slabs of tufa, which was afterwards replaced by a smaller one lined with marble; in the middle of it is a pedestal which supported statues of Castor and Pollux with their horses—for it was at Juturna's spring that they watered their horses after the battle of the Lake Regillus, as the legend tells us.

Close by is a well, which was no doubt at one time fed by an independent spring, but later was supplied by a pipe from the basin; and behind it again is the shrine of Juturna, a small brick building facing north, in which her statue was erected.

The preservation of the whole of this group of buildings is remarkable, and it is perhaps the most attractive corner of the Forum; the statues, the bases decorated with reliefs, the inscriptions in honour of the goddess have all been found, and one can realise the Roman period more vividly than usual.

Hard by is the Temple of the Great Twin Brethren, which now stands free on all four sides. One may admire the massive construction of the walls, of blocks of squared stone, which inclose the solid concrete core; and some splendid fragments of the columns and entablature have been brought to light, including the corner of the pediment at the back.

Close by there stood, till a few years ago, the modern church of S. Maria Liberatrice—remarkable only as a landmark to the visitor to the Forum, now entirely swept away. The ground has been excavated to a depth of 50 ft., and a group of buildings of especial interest has come to light. The great brick shell, already known (and rightly) as the Templum Divi Augusti, has been cleared down to the ground level, without, it is true, much result; but behind it, right under thePalatine, and forming an integral part of it, are two large halls, the original use of which is uncertain.*

The group dates, in all probability, from the time of Domitian, who is known to have rebuilt the temple; but the use of the two halls at the back is doubtful. It is probable, however, that Professor Hülsen's conjecture should be accepted—that the outer hall, which was vaulted, was under the protection of Minerva, and contained the discharge certificates (*tabulæ honestæ missionis*) of the soldiers of the Empire.† The inner hall, which was a peristyle, open to the air, in the centre, with colonnades and rooms round it, he identifies with the library which is known to have existed in connection with the temple, and of which, further, Minerva would be the natural patroness.

From these halls a great inclined plane covered by a vaulted roof ascends to the Palatine in four flights.

These two halls were converted into a church at some time after the middle of the sixth century, and contain paintings of great interest. Three strata may be distinguished in places, ranging from the end of the sixth to the latter half of the eighth century, but those of latest date are by far the most numerous. They have been fully described by Mr. Rushforth in *Papers of the British School*, vol. i. It may be noted that he, writing before the publication of Professor Hülsen's conjecture, inclines to consider the two halls, taken together, as (perhaps) a building for state purposes, pointing out the similarity of its plan with that of the ordinary Roman houses, with its vestibule, atrium, and tablinum flanked by two smaller rooms beyond.

The paintings give us definitely the name of the church as S. Maria Antiqua, and thereby put an end to a long controversy; for the existence of the church has been known since 1702, though only a small portion of it was excavated in that year.

From the short summary I have given, which cannot pretend to be exhaustive or complete, though, I hope, in the main correct, as far as it goes, some idea may be formed of the amount of work which has been done in the Forum during the past five years, and of the surpassing importance of the additions to our knowledge which it has brought. It will be some time before the excavation of the land already at the disposal of the authorities is completed, and further discoveries of interest may be confidently hoped for; while as long as Comm. Boni remains in charge one may be sure that the work is in good hands.

T. A.

* A full report will be found in *Not. Scav.* 1901, p. 41 *sqq.*

* They stand upon the site of earlier buildings, which probably belonged to the palace of Caligula. The remains of a large open water tank, once lined with marble, are especially noticeable.

† The copies of these (of which several exist in various museums) often state that they are *descripta et recognita ex tabula ahenea quæ fixa est Romæ post templum Divi Augusti ad Minervam*

WORKMEN'S COMPENSATION CASES.

THE Court of Appeal at the close of the sittings was engaged in hearing some thirty-six appeals under the Workmen's Compensation Acts, and the law under these complicated statutes seems hardly more settled than it was five years ago. The Legislature is now contemplating an extension of the Acts, and it is to be hoped some simplification will be attained. Several of the recent decisions have some bearing on the building trade, and are worth a brief review.

In McCabe *v.* Jopling and Palmer's Travelling Cradle Company (the *Builder*, Dec. 19), Jopling, a builder under contract to paint a house over 30 ft. high, entered into a sub-contract with the Palmer Company to fix, adjust, and remove the travelling cradles, a system of jibs, ledgers, and ropes which constituted a scaffolding. After the painting was completed about a month, one of the Palmer Company men was killed in removing their apparatus. Jopling was admittedly liable to pay compensation, since it has now been definitely decided that painting is "repair" within the meaning of the Act, but the question of difficulty was whether, under section 4, Jopling could claim indemnity from the Palmer Company. It was contended that the Palmer Company had nothing to do with the "repair" under their sub-contract. The Court held, however, that taking down the scaffolding was part of the process, and it is important to observe that the Court also negatived the idea which has crept in that the repair must be substantial, and laid it down that it must be substantive as contrasted with ancillary, but not necessarily substantial. This decision is important rather in view of former decided cases than on the words of the Act, since section 7 expressly applies its provisions to construction, repair, or demolition "by means of a scaffolding," and the erection and removal of the scaffolding appear obviously included in the process. We have commented several times on the question whether a ladder by itself constitutes scaffolding (see the *Builder*, June 21, 1902; May 3, 1903), as the cases are very conflicting. In Elvin *v.* Woodward builders' steps with a flat board on the top were held to come within the definition, but this time, in Crowther *v.* West Riding Window Cleaning Company, the Court of Appeal refused to disturb the finding of the arbitrator that a simple ladder on which a man stood for the purpose of whitewashing was not scaffolding.

In the case of Brown *v.* The Midland Building and Supply Company an attempt was made to bring a bricklayer, who was injured whilst building a house under 30 ft. in height, within the Act,

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on the double ground (1) that machinery driven by steam or other mechanical power was being used, under section 7 of the Act; (2) that under the Act, read in conjunction with section 105 of the Factory Act, 1901, all the premises were constituted a factory where machinery was used. The machinery relied upon was a mortar mill on the building estate, but this was 80 yards in a straight line from where the man was working, and the mortar when made had to be brought to him a greater distance by road. The Court decided against both grounds of claim. Against the first because the machinery was not "on" the building on which the man was engaged, and against the second on the authority of the case of McNicholas *v.* Dawson (1899), because it is only the machinery which is made the factory, and the man in the case under consideration was not engaged on, in, or about the machinery.

Two other cases, Higgins *v.* Campbell and Morrison and Turvey *v.* Brintons Ltd. should be noted. The Court has decided that anthrax contracted in the course of a man's employment is an accident within the meaning of the Act. This decision is based on the judgment of the House of Lords in the case of Fenton *v.* Thorley and Co., commented on by us in our issue of August 22 last. In that case it was pointed out in the House of Lords that the title of the Act was "an Act to amend the law with respect to compensation to workmen for accidental injuries in the course of their employment," and that in section 1 the words also were "personal injury by accident arising out of and in the course of the employment"; and accident was defined, not as in the cases decided by the Court of Appeal, with reference to the fortuitous, but as an unlooked-for mishap or an untoward event which is not expected or designed. The effect of the decisions now given by the Court of Appeal is this, that when the illness arises out of the employment itself, and is incident to that employment, then it is an accident within the meaning of the Act. This decision, although apparently not directly connected with the building trade, may have a widespreading influence where certain operations involve the risk of illness, such, for instance, as lead poisoning. Difficult questions will arise where it can be shown that the state of health of the workman contributed to the disease; but, as far as can be seen, the employer will remain liable unless he can conclusively prove that the condition of the workman was the actual cause of the illness.

JAPANESE GLASS INDUSTRY.—In a report on industrial development in Japan, the Consul-General of the United States at Yokohama mentions that the native glass industry now manufactures for export as well as supplying home demands. The Japanese Government has under consideration a scheme for subsidising a company to train workmen for the manufacture of plate glass. The plan calls for an expenditure of about 53,000*l.* during the next four years. It is proposed to select a factory, which will be under an engagement to employ a foreign expert, and construct, under his supervision, two furnaces of the latest style, each with a capacity of at least 470,000 square feet of plate glass a month; also to employ thirty-two foreigners as trainers of Japanese workmen, and train sixty-six workmen for its own use and fifty for the Government service.

NOTES.

Proposed Memorial to Mr. Penrose.

IT has been proposed that a memorial to Mr. Penrose should be erected at Athens, with which city and its priceless monuments his name and fame have been so much connected. A large and influential committee has been formed to consider the best manner of carrying out this proposal, and it has been suggested, and the idea has been approved by the committee, that a library hall, which would also be available for use as a lecture-room, should be added to the building of the British School at Athens, where the want of such an addition has long been felt, and should be called the "Penrose Library" or the "Penrose Hall"; and that in this library there should also be erected, or fixed against the wall, a special memorial consisting of either a bust of Mr. Penrose on a suitable pedestal, or (which is the idea most favoured), a medallion portrait in relief, within a decorative tablet with an inscription. Mr. Penrose was a man well worthy of a permanent memorial, both in respect of his personal worth and of the importance of his researches in regard to Greek architecture. His "Principles of Athenian Architecture," which is practically a monograph of the Parthenon, we have always felt to be the most remarkable publication of that class which has appeared in this country. Those who are desirous to give their practical support to the scheme are invited to send subscriptions to Mr. G. A. Macmillan, the Hon. Secretary to the Committee, at the offices of Messrs. Macmillan and Co., St. Martin's-street, Leicester-square.

The London Water Arbitration.

THE Court of Arbitration on the London Water Companies will resume its sittings on January 18. It had up to the commencement of the Christmas vacation proceeded on the whole both rapidly and satisfactorily with its work. On the last day of the late sittings the Court awarded to the Grand Junction Company 3,349,500*l.*, as against a claim of 4,863,195*l.*, and to the West Middlesex Company 3,524,000*l.*, as against a claim of 4,305,245*l.* Roughly speaking, each claim was reduced by about a million, a reduction of a very substantial amount, or nearly one-fourth—but a reduction not excessive as compared with awards in ordinary claims for compensation. The result in the interests of the public can scarcely yet be properly considered until the arbitration is completed, and the total capital of the Water Board is definitely ascertained. It is clear, however, that on the expense of management there should be a considerable saving, but, having regard to the quotations on the Stock Exchange, the amount to be paid in interest on the capital of the Water Board will not permit of any appreciable reduction of the water rates to the consumer.

The London County Council Works Department.

THE report of the Works Committee of the London County Council for the half year ending September 30 last is more satisfactory than has been the case for some time. We have always held that very adverse criticism on this department of the County Council could not be fully justified without a much larger knowledge of the facts connected with that department than is possessed by the public. But from time to time it was clear that there were certain weak places in the system. On the present occasion, on the face of the report, no fault can be found with this branch of the County Council's administration. While the approximate expenditure on works executed by the department in the half year was 187,000*l.*, the result showed a balance of cost below final certificate of 25,853*l.*, and also that nineteen out of twenty works have been carried out at a cost below final estimate. Naturally, this criticism may be made, that if the estimate is high, the actual cost may very well come out below it. When opponents of the County Council urged that the cost of work was constantly exceeding estimates, we pointed out that it did not necessarily follow from this that the cost had been unreasonable. We take it, however, that the officials of the Works Department are now carrying on their business with greater knowledge and experience than formerly, and it is certainly preferable that the final cost of a work should be less than the estimate, for it is on the estimate that the decision to proceed with work must be taken.

Scheme for Another Nile Dam.

ALTHOUGH the Nile Reservoir Works have already shown their great utility, the volume of water stored is admittedly insufficient for the wants of Egypt, and various proposals have been discussed from time to time for further increase of the water supply. The latest idea emanates from Sir William Willcocks, formerly Director-General of Reservoirs, and his present scheme is to provide the necessary accommodation within the boundaries of Egypt proper, leaving the irrigation of the Soudan to be accomplished by the utilisation of the equatorial lakes. Using round figures, it may be said that the storage necessary for the perennial irrigation of the whole of Egypt is 1,000,000 million gallons, of which less than 250,000 million gallons can be stored in the Aswan reservoir. Sir W. Willcocks proposes to make up the deficit, which we may put approximately at 750,000 million gallons (1) by raising the Aswan dam to its full height by adding twenty feet of masonry, and (2) by the construction of a new reservoir in the depression known as the Wady Rayan, the site formerly suggested for a reservoir by Mr. Cope Whitehouse. The second item of this programme is quite free from objection, but the first would obviously involve a deeper submersion of the Philæ Temples at the maximum level of the Aswan reservoir, a proceeding which could not be justified unless proved to be absolutely and unavoidably necessary for the welfare of Egypt.

Accidents on the Central London Railway.

ABOUT three months ago we called attention to two accidents which occurred at the Bank and British Museum stations of the Central London Railway. Our readers will remember that on this occasion a train at each of these stations was derailed during the same day owing to the carriages having jumped the metals,

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and that, in consequence, there was a serious dislocation of the traffic. We then pointed out that there must be something radically wrong with the construction of the permanent way, and this conclusion is confirmed by two accidents which took place on Monday last at the same stations. The first of these happened shortly after three o'clock, when an empty train, which was being shunted at the crossover road beyond the Bank Station, came to a standstill through one of the carriages having jumped the metals. The second accident occurred at the British Museum Station between five and six o'clock in the evening, when a motor coach and the vehicles following left the rails. Fortunately, nothing more serious resulted than dislocation of the services and inconvenience to passengers; but these repeated accidents at the stations in question constitute perfectly clear evidence of defects that ought not to exist on any properly-managed railway. It is a curious coincidence that on each occasion the accident at the Bank Station should have been followed by a similar mishap at the British Museum.

The Connellsville Railway Disaster.

ALTHOUGH full particulars are not yet forthcoming relative to the serious disaster which occurred a few days ago on the Baltimore and Ohio Railroad, the main facts are tolerably clear. The eastward-bound express was running at a high rate of speed along an embankment at the side of the Youghiogenny River, when suddenly it ran into a pile of bridge timbers which had fallen from a goods train. It is said that a curve in the line prevented the engine-driver from seeing the obstruction until he was quite close to it. This is a very reasonable excuse for the driver, but it is very difficult to understand how so bulky an obstacle as a load of timber could be dropped upon a railway line without the knowledge of the men in charge of the freight train. If such an accident were to happen on any English railway we feel sure it would not escape attention, and the first thing done would be to give warning of the event, so that the line might be closed to approaching traffic. We cannot imagine why a similar course was not taken in the present case, unless the interval elapsing between the fall of the timber and the arrival of the express was so short that no kind of a warning was possible. Some further information upon this point is certainly desirable. In the meantime it is satisfactory to note that the baggage-master of the express, although somewhat seriously injured, managed to save the approaching westward-bound train by setting fire to his coat and using it as a signal.

The Chicago Theatre Fire.

THURSDAY morning's papers brought the news of an awful theatre disaster at Chicago, owing to the scenery of the new Iroquois Theatre catching fire. It seems that at least five hundred people have been killed, but whether their deaths were mainly due actually to the fire or to crushing and suffocation is not very apparent from the first brief account. It seems evident that there was a hopeless panic. What it is important to know is how it came about that a new theatre supposed to be built with all the latest improvements had, as is stated, no means of fire-resisting separation between the stage and the auditorium. It may be that such means existed, and that the employees lost their heads and neglected to drop the curtain. Further information on this point will be anxiously waited for by those who are interested in providing against the apparently endless danger from fire in theatres.

The Magnetic Records at Kew.

PECULIAR interest attaches to the results of the analysis of the Kew magnetographs during the eleven years from 1890 to 1900, by Dr. Charles Chree, the superintendent of the observatory department of the National Physical Laboratory, from the fact that these records can now no longer be taken owing to the disturbing effect of the Brentford to Kew electric tramway. The lengthy paper which has just been published by the Royal Society will for many years be the classical paper on the phenomena of the earth's magnetism. The years from 1892 to 1895 were conspicuously years of sun-spot maximum, while 1890, 1891, and 1900 were years of very few sun spots. By analysing the variations of the magnetic elements from month to month, and comparing the way they vary with the way the frequency of sun spots varies, he proves that there is a close connection between the two phenomena. At the same time we think that he conclusively disproves Sir Norman Lockyer's hypothesis of the connection between sun spots and meteorological phenomena. The figures he gives of the mean values of the meteorological elements at Kew during the three years of minimum sun spots, the three years of maximum sun spots, and the mean for the whole eleven years of the cycle of sun-spot frequency, are well worth quoting.

Period.	Mean temperature for the day.	Mean daily range of temperature.	Mean hours of sunshine.	Mean annual rainfall.	Av. wind velocity in miles per hr.
1890–1900	49·87 F.	13·68 F.	1521	22·36	10·21
1892–1895	49·48 F.	13·90 F.	1536	23·54	10·20
1890, '99, 1900	49·71 F.	13·83 F.	1584	21·31	10·20

In addition, the mean height of the barometer for the three periods was 29·978, 29·964, and 29·970 ins. respectively. The close agreement between the mean values for such comparatively short periods of years is very remarkable, and proves that there is no appreciable connection between sun-spot frequency and the weather. Unfortunately the analysis of the magnetic elements has not disclosed the true cause of magnetic storms, and it will be many years before the records which are to be taken at the new magnetic observatory in Scotland will throw further light on the subject.

The Artisan Theory of the Architect.

THE paper by Mr. Bankart on "Old Stucco and Plaster Work," read at a recent meeting of the Architectural Association, and reported in full in our last issue, valuable and interesting as it was in many respects, ought not to be allowed to pass without a protest against the view of the architect's position and function which was, indirectly at all events, put forward in it. Like some other people who have given special attention to one form of decorative work, Mr. Bankart seemed to think that the architect was to be reduced to a kind of artisan, working with his own hands on occasion, and chiefly occupied with the consideration of material and the modelling of it. That is a view of the function of the architect which in the present day is absurd. The architect's business is to evolve the whole idea and conception of a building, as plan and design, not to be occupied as a workman over this or that bit of material. That many architects fall short in their knowledge or perception of the character of material and of the special treatment proper to it we fully admit, but it is not necessary to work with one's own hands to attain this; it depends upon innate or acquired architectural feeling for material. But the architect's real business is with the evolution of a building, which in these days, when the requirements of plan are so complex, cannot be adequately done without full and exact drawings; and all this talk about the mischief of draughtsman's architecture, which we have heard over and over again, only shows a want of perception as to the real problem which the modern architect has to work out.

The Egyptian Hall, Piccadilly.

THIS building will be pulled down shortly, and Mr. T. Nevil Maskelyne, whose tenancy there has extended over thirty years, will remove his entertainment to St. George's Hall, in Langham-place, of which, together with two adjacent houses, he has acquired a forty years' lease, and where some structural alterations are being made for him under Mr. Edmund Buckle's superintendence. The Egyptian Hall was built in 1811-2 at a cost of 16,000*l.*, after P. F. Robinson's designs, for W. Bullock of Liverpool, who there exhibited his natural history museum and a part of the Leverian collection. Robinson took the details of the façade from Denon's work, and mainly from the temple of Isis at Denderah; the figures of Isis and Osiris are by L. Gahagan. On May 1, 1890, Nos. 166-173, Piccadilly, comprising the Egyptian Hall (No. 170), and the Dudley Gallery, were sold at auction for 27,850*l.* The property, covering 14,477 ft. superficial, is held under three leases granted for seventy-five years by the Crown in 1830 at ground rents amounting to 388*l.* 3s. 6d. per annum. The existing underleases yield a total improved rental of about 2,800*l.* net. Our issue of January 3, 1903, contains an illustration of the Egyptian Hall with its original surroundings.

Reporters at the Institute.

ABOUT a year ago the Council of the Institute of Architects, for reasons which we do not understand, removed the reporters from their seats in front of the official table (the usual position, we may say, for those who have to report a meeting), and banished them to a table of their own in a corner of the room. The result has been that mistakes have got into reports of the proceedings such as would never have appeared under the old arrangement, when the

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reporters were in the centre of the room and close to the table and to the front benches. Mr. W. Key seems to have been very much annoyed by the fact that we reported a speaker after Mr. Henman's paper the other day as mentioning "Mr. Keith," when it should have been "Mr. Key." Our reporter thinks that the speaker did say "Keith" inadvertently; at all events, he heard it so, and, if it was a mistake, it is entirely owing to the position now assigned to our reporter, from which it is often almost impossible to hear speakers correctly. As it is important that reports should be accurate, the Council should really consider the advisability of placing reporters where they have the best chance of hearing.

LETTER FROM PARIS.

A WELL-KNOWN corner of the Champs Elysées, the "Caffé appelé cy-devant des Ambassadeurs," built in 1792 by the citizen Dorne, on the site of a small building celebrated in the eighteenth century, is about to undergo some modification, and the present building is to be pulled down to give place to a larger and more modern place of amusement. The Municipality benefits by a very large sum for the rent of this piece of ground, for which the "père Dorne" paid an annual sum of 426 francs in his time.

The "Concours des Façades" has been so brilliant this year that the jury has not yet been able to come to any decision as to the award of the six premiums; twenty houses have been chosen from amongst the large number submitted for competition, and the jury find it a difficult matter to decide which are the most meritorious amongst those selected.

The State has acquired large pieces of ground at Vienna and at Washington for the purpose of erecting embassy buildings for the respective ambassadors. M. Bernier, the architect of the Opera Comique at Paris, will construct the embassy at Washington; and M. Chedanne, architect to the Minister of Foreign Affairs, that at Vienna.

The jury for the competition for designs for a "Caisse d'Epargne" and the restoration of the Hôtel de Ville, at Coutances, has awarded the first premium of 140*l.* to M. Lesage, architect, of Rouen.

A letter signed by the chiefs of the various studios of the École des Beaux-Arts, demanding certain reforms in the principles and organisation of the Prix de Rome competition, has been distributed amongst the professors and students of the École.

The work of the new line of the Metropolitan railway near the Mairie of the 20th arrondissement of Paris has, in spite of all precautions, so upset the foundations of the building that the walls are splitting in several places; the magnificent paintings by Glaize on the walls of the fine "Salle des Mariages" are completely spoiled.

The President of the Republic has signed a decree authorising the classing amongst the list of historical monuments appertaining to the service of Beaux-Arts the tower called "Carbonnière," situated on the territory of Aigues-Morte, at a few miles from the town of that name. The Carbonnière formed portion of the Abbey of Psalmodi, founded by Charlemagne.

M. Henri Marcel, Directeur des Beaux-Arts, has been commissioned to organise the section of fine arts at the Saint Louis Exhibition, in the place of M. Henri Roujon.

The jury for the competition for the programmes to be used in 1904 at the Opera has awarded the first prize of 40*l.* to M. Gorguet, and the second prize of 20*l.* to M. Debat-Ponson.

The Municipal Council have commissioned M. Bahut to produce a lithograph of M. Detaille's large composition at the Hôtel de Ville, representing the return of the Imperial Guard after the campaign in Poland in 1807. The same artist has also been commissioned to make a reproduction of the "Medea" of Delacroix.

At the École des Beaux-Arts the Prix Godebœuf has attracted no fewer than 200 competitors. "Premières medailles" were awarded to M. Boutin (pupil of M. Redon), M. Camille Lefèvre (pupil of M. Laloux), and M. Pierre Aubey (pupil of M. Scellier de Gisors). For the Achille Leclère competition, which is one of the most important of these art competitions, and which will be decided in March, the Académie has given as the subject "The staircase of a large museum, with a vestibule giving access to the ground and first floor galleries."

The Institut de France has received the promise of a splendid gift from M. Jacques Siegfried, who intends to offer them the Château of Langeais, one of the finest examples of French architecture of the fifteenth century, and which is quite a museum of French art of the time of Louis XI. The Institut has not come to any decision on the matter as yet.

Some years ago the construction of a tunnel under the Rue de Rivoli for one of the metropolitan lines compelled the removal for a few weeks of M. Fremiet's equestrian statue of Jeanne Darc, which had decorated the Place des Pyramides since 1873. The statue reappeared on its pedestal, after the tunnel work was over, so much transformed, that it was said that a new work had been substituted, though the sculptor declared that he had only altered the patina of the bronze and the harness of the horse. This explanation was generally accepted by those who did not notice that the action of the horse was different and that the rider was no longer a slender girl mounted on a heavy Norman horse. In reality the artist, with the complicity of the Directeur des Beaux-Arts, had played a trick on the public, and took the opportunity of the railway disturbance of the site to substitute for the first group a new one, which had figured in the Salon of 1890. The Press has been raking up the subject again, and the artist now admits the fact of the substitution, as there is nothing to be gained by denying it. The old work, with which the sculptor seems to have been displeased, has been destroyed under his orders. We cannot but think that he has made a mistake, and that the work erected in 1873 was much the more pleasing of the two. The artist seems to have had, in the interim, a new idea as to the probable personality of the heroine, and has in the later edition given her the appearance of a rather sturdy and masculine woman, instead of the graceful figure of his first statue. It may be more in accordance with probability, but it does not make so pleasing an object.

The Carnavalet Museum has received an addition of a fine picture by Troyon, illustrating the Château of St. Cloud. It is dated 1837, and was exhibited in the Salon of 1838, when it gained for the painter a "première medaille." It is placed in the Carnavalet, of course, from its historic value as a representation of the château in its complete state.

The Municipality of Paris intends to acquire the domain of Prince Talleyrand-Perigord at Montmorency, in order to build there an infirmary, which will take the name of "Asile de la Ville de Paris." The property, which includes the château and 126,000 square mètres of land, is to be sold for 825,000 francs.

ACTON PUBLIC OFFICES AND TOWN HALL COMPETITION.

THE rapid development of the metropolitan suburbs is nowhere more noticeable than in the western districts; with an estimated population of 50,000, large vacant areas suitable for smaller middle-class dwellings and excellent travelling facilities, Acton is quickly passing from the scale of a District Council to proportions more fitly represented by a Corporation administration, and this fact is evidently held in view in the proposal to erect new municipal buildings and town hall.

In the ordinary course of public procedure a competition in designs for the new offices, etc., became necessary, and, from a wide application to compete, seven architects of repute were selected, and we were invited to inspect the plans submitted.

We have had occasion to differ from the awards in recent public competitions, and we are again compelled to take exception to the selection made by the assessor in the present instance, Mr. J. Macvicar Anderson. In view of the attempts in late years to reform the conducting of competitions, we fear that we are not encouraging the system by this open criticism of the assessor's decision; it is to be regretted that no report accompanied his final statement, which would have thrown light upon the merits of the premiated scheme, and perhaps have silenced comment.

Design marked B, by Mr. W. G. Hunt, is placed first, and naturally attracts a close scrutiny in making a general survey of the work submitted. The first impression—the ultimate general effect—is at once unfavourable, for, judging by the perspective view (prepared since the publication of the award), a most unsatisfactory grouping of buildings has resulted. The principal note in the design is a large dome, which rises from a mysterious position, in irritable juxtaposition to the large gable of the Town Hall. Two heavy stone turrets or pinnacles rise from pedimented projections on either side of the main entrance, making an effort to bring the dome into the design of the municipal buildings, distinct from that of the Town Hall. The roof of the latter has a large independent ventilating turret, while, to add to the already disturbed skyline, an important ventilator to the council chamber roof and a chimney to the right of the entrance (neither of which find place on the scale elevations) have been introduced to enhance the composition. In detail, the architecture is commonplace, and is, indeed, a mere accumulation of features popular with architects a generation ago, arranged without sympathy for the Portland stone and red-brick materials to be used. Carved and moulded enrichments are employed to such an extent that clause 10 of the conditions, "the lavish use of ornament is to be avoided and a dignified architectural treatment is desired," seems to have been entirely overlooked. We understand that the assessor was responsible for much of the printed instructions, and therefore it is reasonable to suppose that the style of the fronts has not influenced his selection.

But the planning is even less successful, and we are at greater loss to discover the preferential factors in the scheme under notice. An angle main entrance is provided, with which is combined a drive for carriages (a useful arrangement generally overlooked in these drawings), but the existing Free Library will rob this approach of much of its apparent importance. We find that this entrance, which opens into the grand staircase of the municipal buildings, and, upon occasion, the Town Hall, is the only means of access to the rates office, placed to the left on entering, so that constant traffic arising from petty parochial payments is unnecessarily located in the most important part of the ground floor. The plan gives the curious information that this office will be a rates department by day and a cloak-room by night; but, as we understand it is now the custom of the Council to devote two nights in the week for late payments to suit the convenience of business people, the dual purpose to which the room will be put will lead to much inconvenience, not to mention the trouble involved in clearing the office. We failed to grasp which part of the building was intended to be served by this cloak-room. The lavatories, etc., and cloak-rooms, generally speaking, are arranged in a manner quite strange to our ideas. The report refers to the Town Hall being entered at the east end; here are men's and women's conveniences common to the large public hall, and to the suite of dancing and supper rooms, which we maintain are inadequate and inconvenient; staircases ascend left and right to the Town Hall, and are so planned that the two sets of water closets below are 4 ft. 8 in. high, whilst some of the solid steps are housed into windows One suite only of rooms for dances, suppers, etc., is provided in this design, while the conditions ask for two, including kitchens; there is no ambiguity about this requirement, and in our opinion the omission is utterly at variance with the terms of the competition. Two large rooms *en suite* are shown, but if only one is used for dancing, much inconvenience will arise about the doors; one large kitchen is supplied with gas cooking apparatus, which avoids carrying a flue through the Town Hall; but in any event the cooks, servants, and waiters will require sanitary conveniences, which we could not find on the lower ground floor plan.

We do not agree with the placing of the Town Hall next the main street (shown on the side street by all other competitors), through which heavy electric trams are hurrying all day and far into the night, nor is a middle

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passage in the seating accommodation desired by public speakers. The water closets and lavatories placed at the ends of the side galleries are beyond all supervision, and unless prominently indicated, they may be taken for exits in an emergency. The majority of the Councillors will face strong daylight when seated in the Council Chamber. The placing of the Coroner's Court on the ground floor instead of the first floor, as required by the conditions, is, in our opinion, an improvement, but the transposition cannot be said to be one of the "slight modifications" allowed in the printed replies to questions. No separate room or convenience is given to the Coroner, and the Chairman's-room, although much smaller than asked for, has a very poor outlook. We could draw attention to other defects, but enough has perhaps been said to justify the emphatic exception which we have already taken to the selection of this design, the estimated cost of which is 52,946*l.*

Design marked A is the work of Mr. H. T. Hare. Here, as in common with the remaining competitors, the Town Hall is placed on the side street. In most respects the scheme has a practical working character, but it suffers from an undue effort to arrange the general offices in positions where street noises will not penetrate; corridors are, therefore, placed on two floors on the street side of the principal front, and offices overlook the baths and other buildings in the back parts of the site. This arrangement further adds to the extent of passages, which in this design are in large proportion to the working departments. The Coroner's Court is in a noisy place on the side street, and the rate collector's office too far into the building for ready access. The elevations are a great advance on those previously referred to, being satisfactory in detail and suitable in scale for the site. The estimate is the lowest—51,553*l.*

Mr. Maurice B. Adams is the author of design marked C, which is represented by an elaborate set of drawings, completely worked out; a separate drawing is given with designs for the groups of figures and other sculpturesque ornament. The scheme, however, is much too large (77,471*l.* is the estimate) and complicated for the needs of municipal Acton. The plan conveys the impression of being confused, especially in taking the great number of staircases into consideration, and the whole design lacks simplicity and is too laboured. Entrances and exits are well arranged, and all practical points have been considered. The plans provide for two suites of supper and ball rooms, kitchens, etc. (a pantry kitchen being also included), as required by the conditions, which, although adding to the complexity of this design, are here capable of a more simple treatment. The detail of the elevations is small in scale at the expense of breadth and dignity.

The drawings illustrating design D have commendable power and lucidity, in which respects they are foremost of the seven sets submitted. Messrs. Russell and Cooper, the authors, have produced a vigorous and dignified group of buildings, which is the outcome of a good symmetrical plan, and is well adapted to the nature of the site. Two sets of supper-rooms are provided, with kitchen accommodation common to both suites, but the lavatories and cloak-rooms are quite inadequate when only one suite is in use. The exit staircases from the Town Hall galleries are also intended to be used by artists in passing from the stage to the dressing-rooms—an arrangement giving rise to much discomfort to the performers at the close of a play. The Chairman of the Council has no private convenience, and no separate room is given to the Coroner. The main entrance is placed in the centre of the High-street front, above which rises a well-designed tower, but the piers shown on the plans do not seem to be strong enough for the work of supporting this tall erection. The Council Chamber, Committee rooms, and, indeed, all departments are admirably placed, and exits, stairs, and approaches well considered. 59,881*l.* is the author's estimate.

Messrs. Lanchester, Stewart, and Rickards have submitted a design, marked E, which would have well suited the site in the matter of scale. A good working office plan is shown, but the Town Hall and ball-rooms leave much to be desired. A separate carriage drive, with carriage porch, is introduced, which forms the entrance in joint use by the public for the Town Hall and by private parties, for the two suites which are placed left and right of the doorway; moreover the town hall stairs are mixed up with one of the suites. The greatest defect, however, is the extraordinary absence of lavatory and cloak-room accommodation. The drawings are less complete than others sent in, and show no regard for block plan, scales, or cardinal points.

A very ambitious scheme, F, to cost 84,688*l.* is the work of Mr. C. E. Mallows, and is represented by a fine set of drawings. Portland stone is intended to be used throughout the principal fronts, which we think is a little beyond the basis of one shilling per foot cube laid down by the Council. In spite of the great cubical contents the author omits one suite of dance and supper rooms, but provides lofty and wide halls and spacious passages out of all proportion to what is required. A heavy but dignified character is given to the fronts; the main entrance is placed in Winchester-street, and a large tower is introduced to emphasise that fact, but nothing in the nature of piers is shown on the first floor plan carrying the great weight above. The Coroner's Court is situated at the eastern extremity of the first floor, where it will be necessary for the Coroner to pass through the court to reach his retiring-room. The Council Chamber is not well placed, being at a different level and too far from the Committee rooms, but the most remarkable point in this part of the plan is that the Councillors approach their sanitary arrangements through the Council Chamber.

The plans which have most successfully interpreted the Council's requirements are those marked G, for, while providing all the accommodation required by the conditions, the authors, Messrs. Ardron and Dawson, have arranged it with considerable regard to economy, and have maintained a practical working efficiency. The estimate is 57,626*l.* The Town Hall is placed on the side frontage, well provided with public entrances and staircases; the emergency exits are, however, capable of improvement. Two suites of supper and dance rooms are well planned, each having separate and distinct entrances, kitchens, and conveniences. The Council Chamber is, however, placed next the side street, where noises might disturb the deliberations of the members more than if a central position had been contrived. The grouping of the buildings should be satisfactory, for although the style selected is not the best of those submitted, the elevations have considerable merit and dignity. This is the only design which appears to meet all the requirements of the Council's conditions, which further demanded their being "substantially adhered to."

The drawings, generally speaking, are of a high order, and each competitor receives 50*l.* as remuneration for his skill and trouble; but an enormous amount of wasted effort is occasioned by the eighth scale drawings, when in our opinion sixteenth scale sketches would have been sufficient to illustrate the intentions of each design.

REGENT-STREET, AND NASH'S IMPROVEMENTS; CARLTON HOUSE; PALL MALL; ST. JAMES'S-SQUARE; PALL MALL EAST; AND THE HAYMARKET: 1801—1900.

AT the beginning of last century the only direct way from the east end of Piccadilly to Oxford-street was by Swallow-street, a straight and narrow road of which the southern part remains (opposite St. James's church), and that entered Oxford-street opposite Prince's-street, Cavendish-square (Fig. 1). To the south lay Jermyn-street and St. James's-market, the market (built in 1666 for Henry Jermyn, Earl of St. Alban) being entered from Pall Mall by Market-lane along the west side of the Opera-house, and by St. Alban's-street from opposite Carlton House. An Act of 1799 (39 Geo. III., c. 74) had empowered one William Taylor, or in his default, the Lords of the Treasury, to make a new street 55 ft. wide, through the former Six Bells-alley, from the Haymarket, crossing St. Alban's-street into Charles-street, St. James's-square, for a better approach to the King's Theatre in the Haymarket. A more extensive improvement, advocated some fifty years before by Gwynn, took shape under an Act passed on July 10, 1813 (53 Geo. III., c. 121). That measure sets forth:—

WHEREAS it would be of great Accommodation to the Public, and be the Means of opening a more easy and ready Communication from *Mary-le-bone* Park and from the Northern Parts of the Metropolis in the Parish of *Saint Mary-le-bone*, to *Charing Cross*, . . . if a new Street were opened and made from a certain Spot in *Pall Mall* at or near *Saint Alban's* Street, to the South End of *Mary-le-bone* Park, . . . to run at right Angles with *Pall Mall* into *Piccadilly*, and from thence in a northerly Direction to the South End of Mary-le-bone Park . . .; and if Provisions were made for widening the East End of *Pall Mall*, and for continuing the same Eastward by a new Street into *Saint Martin's Lane*, terminating at the Portico of *Saint Martin's Church*; and for widening *Cockspur Street* from the South End of the *Haymarket* to *Charing Cross*; and for forming an open Square in the *King's Mews* opposite *Charing Cross*; and for continuing *Charles Street, Saint James's Square*, from the East End thereof, into the *Haymarket*: . . . be it enacted . . . That the Commissioners for the Time being of His Majesty's Woods, Forests, and Land Revenues, shall be and they are hereby appointed Commissioners for carrying the Purposes of this Act into Execution. . . .*

The Act of 1813, forty-two folio pages in length, provides for, with many other things, a revival of the Act of 1799 in respect of the extension of Charles-street eastwards, the preservation of Air-street as a thoroughfare, of George-court in Swallow-street, and of Archbishop Tenison's chapel (1702), now St. Thomas's church, in King-street; the widening of Swallow-street, lower end, to Leicester, now Heddon, street; the making of the western portion of Great Marlborough-street; a public carriage-way, 40 ft. wide, into the lower end of Marylebone, now Glasshouse, street, and an open footway, 10 ft. wide, from the Quadrant to Vine, now Warwick, street; the widening of King-street into St. James's-street, and of each end of Jermyn-street; the opening out of a direct communication from the north end of the intended new street through Portland-place (then blocked by the park railings at Nos. 36 and 37, since Nos. 90 and 75, respectively, three doors beyond Devonshire-street) into the park, and the opening of Harley-street, similarly blocked, into the park; the completion of a continuous road around the outside of the park; and the construction of a new sewer, in relief of the King's Scholars' Pond sewer, or Tyburn, from the park along the whole line of the new street to Charing Cross, and thence along Scotland-yard into the Thames at the Lime Wharf. In 1812 John Nash, as architect and surveyor to the Woods and Forests and one of the architects attached to the Board of Works, had, in conjunction with his former pupil, James Morgan, begun the laying out of the Crown lands of Marylebone (now Regent's) Park, cited in the Act as "containing in the whole five hundred and forty-three acres," their plans, for which a premium of 1,000*l.* had been offered, being preferred to those of Thomas Leverton and Thomas Chawner, architects to the Inland Revenue Board, who would have covered the whole area with urban villas. Moreover, the real purpose of the measure was to make a high road through what is mainly Crown property from Carlton House to a projected royal palace in the park, for which Nash had chosen the site, about 18 acres, of Jenkins's nursery grounds, where are now the Royal Botanical Society's gardens, laid out in 1840-2 by Decimus Burton and Robert Marnock. Of that scheme the only vestiges are Park-crescent and Park-square (both designed by Nash), Chester-road, leading from the Outer Circle into the Inner Circle, and the Broad Walk, formerly Green-lane. John Gwynn observes in his "London and Westminster Improved," 1766, that "the New (Marylebone) road is proposed to be the great boundary for restraining the ruinous practice of building on the north side of the town."

When Nash applied himself to the plans—he then resided at No. 29, Dover-street, Piccadilly—he was confronted by two obstacles, which he overcame in a masterly manner. Firstly: an extension southwards of Portland-place would enter Pall Mall opposite St. James's Palace,

* We should mention that an Act of 1810 (50 Geo. III., c. 65) had united the offices of Surveyor-General of Woods, Forests, Parks, and Chases, and of Surveyor-General of the Land Revenues of the Crown under a Board of Commissioners of Woods, Forests, and Land Revenues. Subsequent statutes placed (1814) His Majesty's Works and Public Buildings under a Surveyor-General of Works and Public Buildings; then (1832) the duties of the Surveyor-General and the Commissioners were joined under a Board styled the Commissioners of Woods, Forests, Land Revenues, and Public Buildings; and then (1851) that department was again divided into Works and Public Buildings and Woods, Forests, and Land Revenues, the post of First Commissioner of the former being made a political office.

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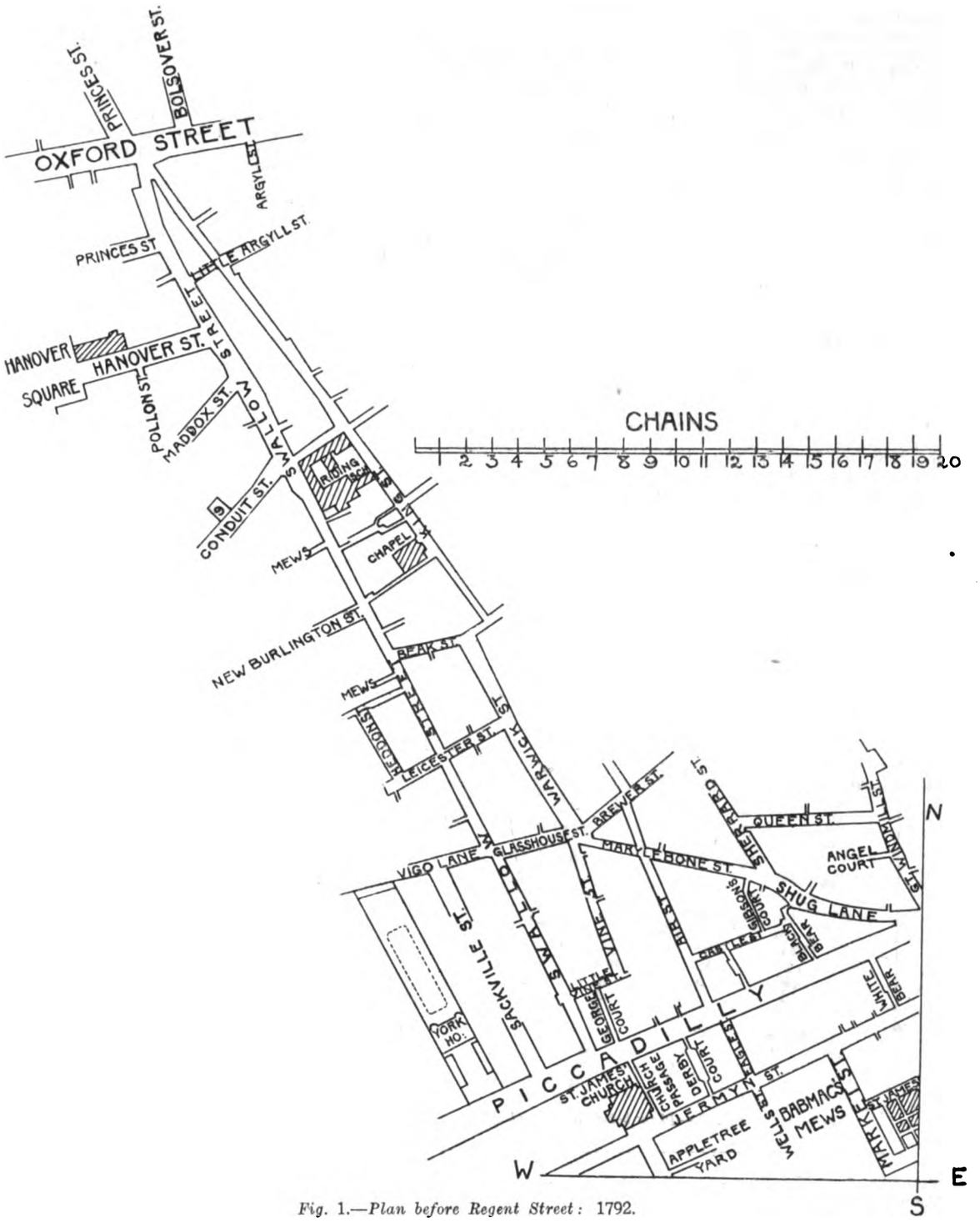

Fig. 1.—Plan before Regent Street: 1792.

whilst a perpendicular from Carlton House would meet the park where is now the garden of Park-crescent, and not include Portland-place at all. Secondly: he found that the south end also of Portland-place was blocked entirely across by the north garden-wall of (old) Foley House,* designed by S. Leadbeater, or Leadbetter, *circa* 1740, for Lord Foley, the wall being upon a line drawn from No. 68, now No. 13, to No. 1, now No. 20, Portland-place (Fig. 2). The east garden-wall lay along Edward-street, which is now the southern arm of Langham-street; the garden extended southwards to the rear of the houses on the north side of Mortimer-street (west), renamed Cavendish-place. Nash acquired (old) Foley House and grounds for 70,000*l.*; on the site of the north garden, which has not quite disappeared, he built Langham House (since taken for No. 11) for Sir James Langham, Bart., and some other houses at the south end of Portland-place. He opened out the short road into Chandos-street in front of the Langham Hotel [John Giles, 1863-5: July 25, 1863 *], brought his street into line with, and absorbed, Edward and (old) Bolsover streets, and so continued Regent-street to a circus at the crossing of Oxford-street. With (old) Bolsover-street should not be confused the present street so named, which at that time was called Norton-street. By reason it is said of some dispute with Sir James Langham he went round instead of through the Foley House site; but by advancing the circular peripteral portico of his church of All Souls' (1822-3) into the elbow of Langham-place, Nash effectively disguised the awkwardness of the turning, whilst partially concealing the open ends of Riding House and Langham streets. The southern arm of the latter thoroughfare (formerly Queen Anne-street East, and afterwards Foley-place) is all that he left of Edward-street. The design of the fluted spire rising to a point through the Corinthian peristyle of the bell-tower has been much criticised; yet we should regard the church less as a separate building than as a complement to the general grouping, where it enhances the prospect when seen at a distance from either side. From Oxford-street he incorporated Swallow-street, following its bend at Little Argyll-street, where he relieved the angle with two peristylar buildings (that to the north being the old Argyll Rooms) whose boldly-rounded outlines also afford a pleasing contrast to the concavity of the circus, and so southwards, absorbing Foubert's Riding School, to the meeting of Vigo-lane (since Vigo-street) and Glasshouse-street, whence he carried the road by a majestic quarter-circle sweeping round to meet the extended axis of Carlton House. On the higher ground at that point he completed the prospect with the façade of the County Fire and Provident Life offices. Then, having absorbed Castle-street, leading from the south part of Air-street into Shug-lane, and crossing Piccadilly with the lately disfigured circus, he laid the road through St. James's-market and St. Alban's-street into Pall Mall in front of Carlton House (Fig. 3). D. R. Roper acted in the valuation of the property for the Commissioners, whose fifth report, May 6, 1826, states that 1,472,719*l.* 6s. 3d. were expended in forming the thoroughfare, and 60,863*l.* 10s. 7d. in constructing the sewer.

Nash took the lease of the Quadrant, the first portion that was erected (see lithograph). Its chief feature—reproduced by him on a smaller scale in Park-crescent—was the two colonnades, each consisting of fluted Doric columns, 16 ft. 2 in.

* The existing Foley House, No. 8, Portland-place, was designed by James Wyatt (*obiit* 1813) for himself in or about 1786. The Doric portico is a later addition, perhaps by Captain Charles Wyatt, who bought the house after James Wyatt's death, and built the adjoining house.

* Dates within *square* brackets relate to illustrations in the *Builder*.

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high, raised upon granite bases, with a balustrade above the cornice, and covering the entresol floor and footpath on either side; the columns were cast at the Carron Foundry; eight of them remain across Air-street and Swallow-street. The shopkeepers complained that the colonnades obscured their daylight and had become from the first a common resort of undesirable persons of both sexes. So they were taken down in December, 1848, by Pennethorne, who replaced them with continuous balconies carried upon enriched dwarf pilasters and consoles just above the mezzanine floors, and rearranged that part of the two fronts. Thus we lost a unique and scenic piece of street architecture which presented an extended and charming perspective. The name of "Quadrant" has gone, too; means of lighting are improved, whereas they who frequented its pavement and sought its shelter remain there to this day.

Nash completed Waterloo-place and most of Regent-street (south) in or about 1825. On the east side of the latter he built in 1823 Nos. 14 and 16 for himself and his relative, John Edwards. On retiring from the profession he removed from Dover-street into No. 14, where he decorated his picture and sculpture gallery, on the first floor, with copies of Raffaelle's pictures and designs in the Vatican, made by artists he employed in Rome. Decimus Burton (*obiit* 1881) built the opposite York House as Club-chambers on the site, in part, of a house designed by Nash for C. Blicke; of the earlier eminent architects. Soane designed, 1820-1, the block Nos. 156-170—it is unmistakably his—including the premises for Robins the auctioneers (now Warwick House), between Beak-street and Chapel, formerly Hide, court on the east side. To him also is due on the opposite side either, and more probably, the block Nos. 133-167, between Heddon and New Burlington streets, or the block Nos. 169 (since rebuilt) to 201, marked by its massive and lofty pilasters, between New Burlington and Conduit streets. The block Nos. 172-222, including Carbonell and Co.'s (until last April), between Chapel-court and Argyll-place, is by Robert Abraham (1819); the block Nos. 224-44, next northwards, to Little Argyll-street, has a highly characteristic elevation by Nash. The two rounded corners at Little Argyll-street, with their grouped columns and pilasters, constitute a pleasing contrast to the straight lines of the successive façades as well as to the adjacent concave circus; but the hemispherical dome resting upon scamilli no longer distinguishes No. 246, whilst Nos. 248-50 replace the concert-room of the Argyll Rooms, or Harmonic Institution, as rebuilt by Nash in 1818 on the site of the former Rooms which Slade had converted five years previously out of a house in Little Argyll-street where Colonel Greville had established the Pic-Nic Society. The concert-room, erected for Welsh and Hawes, and famed for its acoustical properties, was burned on February 6, 1830; its long balcony, carried upon eight termini Gwilt says that the front is modelled reputedly upon the river-side elevation by Inigo Jones of old Somerset House [January 17, 1903; after Paul Sandby's drawing of 1756], the proportions of the ornamentation of the columns and entablature being taken from those of the Pantheon at Rome. Abraham's planning for the small and triangular interior is skilfully done. C. R. Cockerell's front, 1823, of the church of St. Thomas has been blocked in at No. 172; the entrance into the vestibule was through a high arch with channelled rusticated piers and voussoirs, the elevation being as tasteful as dignified. Some of the houses have been rebuilt in quite incongruous styles, three or four are marked for demolition, the elevations of several have been changed, the former porticoes, doorways, and projecting balconies are removed, cumbrous fascias and boards obscure the ground floor windows, and the front walls seem to rest upon vast sheets of plate glass.

James Thomson (*obiit* 1883) built the Polytechnic in 1838, and ten years afterwards took in the adjoining residence, on the south side, of Colonel Wood, M.P., for the theatre or lecture-hall, rearranging the façade. The casting of the elliptical iron girders, 40 ft. 6 in. in span, and 11 ft. 9 in. rise, for the roof (1837) of the main hall, 120 ft. long and 38 ft. high, was considered to be a triumph of skill. In 1860, after a disastrous failure of the staircase, T. H. Wyatt made some internal and external alterations, and fitted the staircases with steps of

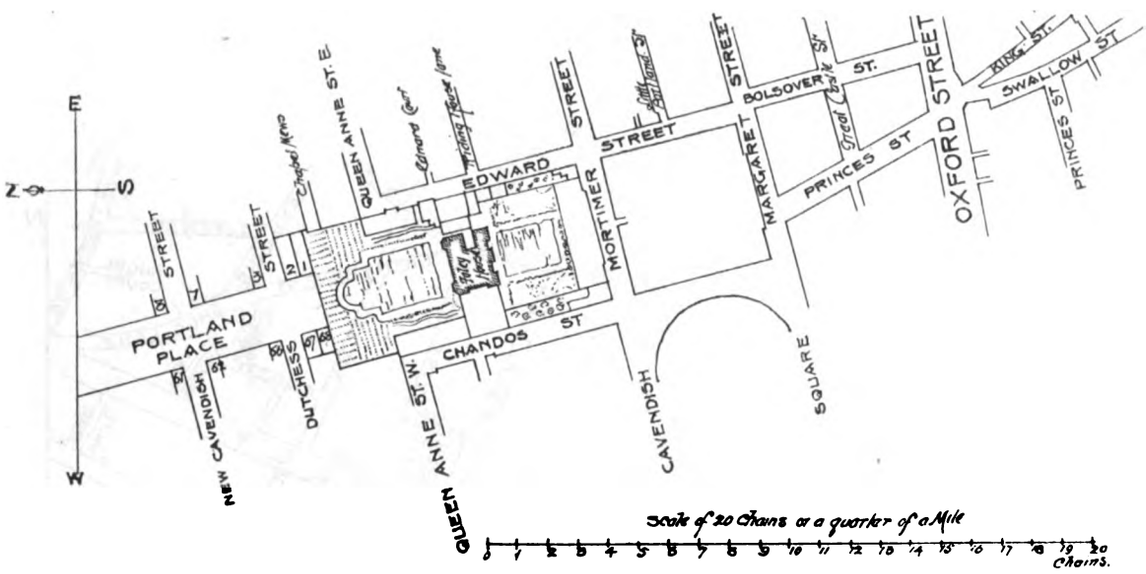

Fig. 2.—Plan between Oxford Street and Portland Place: 1792.

house yet remain the two wings, Nos. 13 and 17, marked with pilasters having the ammonite or ram's-horn volute, which will be noticed also at Nos. 19-25. His nephew and successor, Henry M. Burton, altered No. 1, formerly Maurigy's, and now the Continental Hotel, into a club-house. G. Stanley Repton (*obiit*, it is said, 1858) built St. Philip's Chapel for his brother the Reverend Edward Repton in 1819-20, at a cost of 15,000*l*. The church, having a tetrastyle portico after the Roman Doric order with deep pediment, a square tower carrying a copy of the Choragic Monument of Lysikrates, and boukrania on its façade, is about to be sold, together with its site, by the trustees in pursuance of an Act which was passed in the course of last session. The house, rebuilt by Nelson and Innes in 1856-7, of the Junior United Service Club at the corner of Charles-street was originally designed by Sir Robert Smirke, R.A. (*obiit* 1867), and altered in 1842-52 by Burton for the United Service Club, who sold it to the present proprietors. Nos. 20-2, east side, at the corner of Jermyn-street, were rebuilt for Messrs. Elkington and Co. in 1869, by Frederick Peck (*obiit* 1875).

Influenced, it may be, by Robert Adam's method, though not by his style, Nash conceived two lines of houses which whilst preserving the continuity of the general design, should comprise a succession of single blocks severally presenting separate and complete façades. For coadjutors he had Cockerell, Soane, Abraham, Repton, Smirke, and other carved by J. G. Bubb, projected over the pavement. Hanover, or St. George's, Chapel, was built in 1823-5 by Professor Cockerell (*obiit* 1863) of Bath stone, at a cost of 16,180*l*., upon a confined site at the corner of Prince's street, which the Crown gave to the parish The plan and lighting of the interior have been compared not inaptly with those of Wren's Church of St. Stephen, Walbrook. Some of the stones were remarkably large, the door-lintel weighed nearly 6 tons and the single stones of the architraves of the portico measured some 14 ft. in length. In Mr. Geo. J. J. Lacey's perspective drawing, with plan [March 2, 1895], the four columns of the portico appear without their continuous podium; the alteration thus indicated was made about fifteen years ago. That beautiful edifice was ruthlessly sacrificed by its demolition in October, 1896, after it had been sold to the Woods and Forests for 45,000*l*., in favour of a new church, St. Anselm's, in Davies-street, Mayfair. The site of 6,666 sq. ft. was let at auction in February, 1897, on a building lease for eighty years at a ground rent of 2,120*l*. per annum, equivalent to 6s. 4d. per foot, or a capitalised sum of nearly 414,000*l*. at thirty years' purchase On the site stands Regent House, built on a contract for 26,785*l*. by Mr. J. Carmichael after Mr. G. D. Martin's designs. Of the County Fire Office, 1819, which takes so commanding a position at the top of the incline from Pall Mall, the principal elevation is, it would appear, by Abraham, though some ascribe it to Nash. Parkspring stone and cantilevers under the landings for a new management who opened an educational department. Having been closed on September 3, 1881, as a place of scientific entertainment, the building was taken over for a young men's Christian institute by the late Quintin Hogg, who there expended much of his labours and private resources upon an institution that gave a name to many similar schools in London; the governors acquired the Marlborough Rooms, formerly the theatre, in 1892, for a school of art; in November, 1896, they let some opposite premises, No. 316, to the Technical Education Board, L.C.C., for the Central School of Arts and Crafts. Queen's Hall and St. George's Hall occupy the site of the Portland Bazaar and German Fair. The former [February 14, 1891; two two-page views and plan in text] was erected by Mr. C. Wall, the exterior carving being by Messrs. Sidney W. Elmes and Son, and special works by Messrs. Doulton, Noel Quillet of Paris, Campbell, Smith and Co., and others. A controversy that arose as to the authorship of the design was referred in 1893 to the then President of the Institute, Mr. J. MacVicar Anderson, who adjudged that, subject to a few variations, the building had been erected from plans, as distinguished from elevations and sections, which were designed by Mr. C. J. Phipps, and that the design of the exterior and interior in other respects, as well as the completion of the hall, were due to Mr. T. E. Knightley, under whose sole superintendence the building

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had been carried out (see the *Builder* of December 30, 1893). St. George's Hall, where the German Reeds, on quitting the Gallery of Illustration, Regent-street, and Corney Grain gave their entertainments, was built in, we believe, 1838, and rebuilt after a fire in 1852: in April, 1898, it was renamed the Matinée Theatre.

Conduit-street (1718).—The Royal Institute of British Architects, founded in 1834 under the presidency of Professor Cockerell, and incorporated by Royal charter of January 11, 1837, was joined in 1842 by the Architectural Society (1834). Some years afterwards the Institute removed from 16, Lower Grosvenor-street, to No. 9, built in 1778-9 by James Wyatt (*obiit* 1813) for a Mr. Viner, on the site, it seems, of a house built for Lord Macclesfield on quitting Gerard-street, Soho. In 1898 they leased from the Architectural Union Company five rooms on the second floor, the lease being co-terminous with that of the premises already occupied by the Institute. No. 37, a home of George Canning, and altered since his time, was portion of Trinity Chapel, erected by Tenison when rector of St. Martin-in-the-Fields, where now stands Ulster House. The chapel is delineated in the background of L. Knyff's view, engraved by J. Kip, 1707, of Burlington House.

Carlton House, or Palace, No. 114, Pall Mall, was built for Henry Boyle, Lord Carlton, on a part of the Royal Garden leased to him by Queen Anne in 1709, for thirty-one years at a ground rent of 35*l.* per annum, and descended in 1725 to his nephew Richard, Lord Burlington, who in 1732 gave it to his mother, the dowager Countess, who in that year sold it to Frederick, Prince of Wales. The grounds extended from the garden of Marlborough House to the riding-house, or Carlton Ride (since used as a depository of the Queen's Bench, Common Pleas, and Exchequer records, and pulled down in 1858), near Warwick-street. Kent laid them out for Lord Burlington with a bowling green, bowers and grottoes, a cascade, a marble saloon, a bath, and statues and busts in imitation, Walpole says, of Pope's gardens at Twickenham. Flitcroft made some alterations of the house in 1733 for Frederick, Prince of Wales, and Sir Robert Taylor (*obiit* 1788) recased its red brick with stone. In 1783 George, Prince of Wales, employed Henry Holland (*obiit* 1806) to enlarge the house and remodel the interior, which was sumptuously furnished for the Prince's marriage in 1795. Holland, 1788-90, renewed the façade, 195 ft. long, with a Roman Corinthian hexastyle portico for carriages, and added the screen of paired Ionic columns that separated the front yard from Pall Mall (see lithograph); the private apartments, 115 yds. in length, were extended far beyond the upper, or state, floor, by the Gothic dining-room (Holland) at the east and at the west by the Gothic conservatory. Thomas Hopper (*obiit* 1856) designed the conservatory, 72 ft. by 23 ft., and 20 ft. high, after Henry VII.'s Chapel, the light entering through the tracery of the vaulting (1807), and made other alterations after Holland's death. In 1814 Nash built in the garden a reception-room for the visit of the Allied Sovereigns after the peace. The room, having twenty-four sides on plan, a diameter of 120 ft., and a central pillar, was given by the Prince Regent to the Royal Military Depository at Woolwich, where it now stands as the Rotunda and contains the museum of models, arms, trophies, etc. King George IV., when Regent, had proposed to connect Carlton House to Marlborough House and St. James's Palace by a gallery to contain royal and historical portraits; but that scheme for a National Gallery came to nought. The Act 7 Geo. IV., c. 77, enabled the Commissioners of Woods and Forests to take down Carlton Palace, and ordained that the ground and new buildings should become part of the Land Revenues of the Crown, and that the purchase monies with fines upon the granting of the leases should be devoted to the repair and improvements of Buckingham House. At the demolition in 1828 much of the interior ornamental work, friezes, columns, mantel-pieces, and so on, were refitted in Buckingham Palace. The eight columns of the carriage-porch, but not their highly enriched entablature, were, as we are authoritatively informed, used by Wilkins for the National Gallery portico. Carlton House-terrace—the eastern portion, 1828, by Nash and Pennethorne, and Carlton-gardens stand on the site of the house and grounds. B. D. Wyatt (*obiit* 1850) built a house in the terrace for the Marquis of Tavistock, 1831, and Burton built

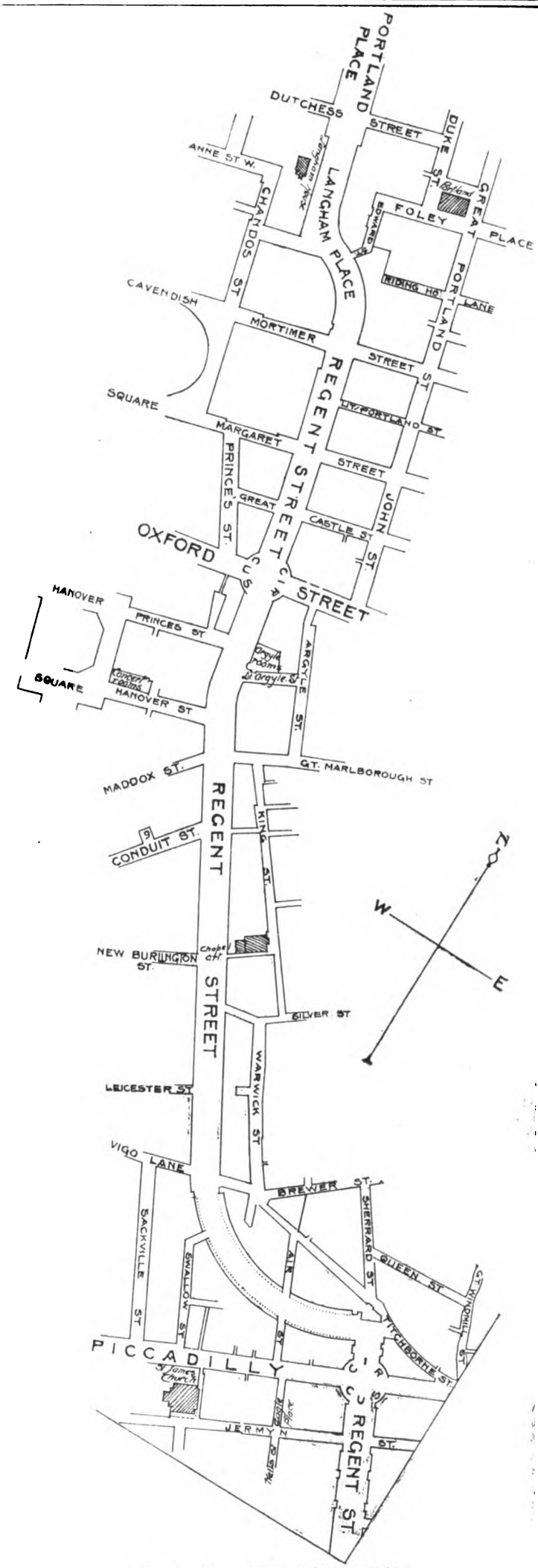

Fig. 3.—Plan of Regent Street: 1819.

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houses for Lord de Clifford and Lord Stuart de Rothesay, 1828-32; houses in the gardens were built for J. Wilson Croker and H. Baring by Sir Robert Smirke. The Tuscan column, by B. Dean Wyatt, 1830-3, is 123 ft. 6 in. high, and stands upon a concrete foundation 53 ft. square at the base; the excellent masonry in Scotch granite by Nowell has an unpolished fine-axed surface, the spiral stairs and newel are cut from solid blocks, and the shaft has a very slight entasis. The bronze statue by Sir Richard Westmacott, R.A. of the Duke of York in his Garter robes was raised on April 8, 1834. To the building fund of 25,000*l.* the army subscribed one day's pay, and Soane, it is stated, contributed 1,000*l.* It was at first intended to place a fountain on the site.

Pall Mall.—Much of Pall Mall has been rebuilt by famous nineteenth-century architects. The members of the Athenæum migrated from No. 12, Waterloo-place, on February 8, 1830. The club-house, by Burton, has a frieze modelled by John Henning from that of the Panathenaic procession on the Parthenon; the statue of Minerva is by E. H. Baily, R.A. The total cost with fittings amounted to 43,102*l.* In 1891 the hall and staircase were redecorated under the directions of Sir L. Alma-Tadema, R.A., and Sir E. J. Poynter, P.R.A. To Burton as official architect succeeded T. H. Wyatt (*obiit* 1880) who made some interior improvements, and Charles Barry, who resigned in May, 1899. The top story, set back from the front lines of the building, but unconcealed from view from the street, was added by Mr. T. E. Collcutt in 1899-1900. The area balustrade of old Purbeck Portland from Swanage has panels of Irish green marble. Next west is the Travellers' Club, 1829-32, with which Sir Charles Barry (*obiit* 1860) first attained his general reputation. The design, selected in a limited competition, is remarkable for the simple, albeit dignified, and reposeful beauty of the two Italian elevations. Messrs. Lee built the house at a cost of 19,000*l.*; in 1889 Charles Barry (*obiit* 1890) repaired and redecorated the interior, and reconstructed the drainage, etc. [January 5, 1901; interior of the library.] For the Reform Club, 1838-9, Sir Charles Barry took his motive from the Farnese Palace at Rome; the designs, carried out at a cost of 80,000*l.*, were preferred to those of Basevi, Blore, Smirke, Burton, and Cockerell, who, with him, were invited to compete.* On July 18, 1846, we published illustrations of the kitchens, larders, etc., with a plan, and a description by Alexis Soyer, the famous *chef*. The club was established in 1832 at Gwydyr House, Whitehall; the club-house occupies the site of Nos. 100-5, including, at No. 103, Angerstein's Gallery, opened to the public on May 10, 1824, after the purchase for 57,000*l.*, of the thirty-eight pictures which formed the nucleus of our National collection. For an extension of the Carlton Club, as first built in 1835-6 after designs by Sir Robert Smirke, R.A., his brother, Sydney Smirke, R.A. (*obiit* 1877), and George Basevi the younger were appointed as joint architects in 1845 by a ballot of the members, as the committee disapproved of the designs submitted in competition. Basevi's accidental death in Ely Cathedral on October 16 of that year prevented him from sharing in the work. The west side having been built in 1846-7 on Grissell's tender for 19,000*l.*, the entire design was completed in 1855 by Sydney Smirke, who pulled down the original building (east) for a front 133 ft. long and 70 ft. high. [May 8, 1847, complete front; June 16, 1855, central part of front and plan of ground floor; July 14, 1855, garden front and section of north front wall.] Caen stone, with Peterhead granite for the columns and pilasters were used in the three sides, the upper Ionic order of the north front, the sculpture excepted, follows that of the Library of St. Mark in Venice; the frieze is by John Thomas. The plan is that of the vestibule, or *cortile*, with the coffee-room on the west, and the morning and writing rooms on the east; on the first floor are the two libraries (east), card-room over the entrance hall, and billiard and house dining-rooms over the two ends of the coffee-room, above the middle part of which is a skylight. The club, founded in 1831 in Charles-street, St. James's-square, removed in 1832 to Lord Kensington's house in Carlton-gardens, and thence to Pall Mall. The Oxford and Cambridge Club, by Sir Robert and Sydney Smirke, 1836-7, presents a great amount of ornamental detail, the panelled bas-reliefs over the windows being executed in cement by Nicholl after Sir Robert Smirke's designs. The Army and Navy Club [March 3, 1851], for which Lord de Mauley's house and its site were purchased for 52,000*l.*, is by C. Parnell and Alfred Smith, and cost 35,000*l.*, the equipment excluded; the rusticated lower floor is taken from the Palazzo Cornaro a S. Maurizio of Jacopo Tatti, otherwise known as Sansavino. The Junior Carlton [July 20, 1867, with two plans] by David Brandon, was considerably enlarged by Messrs. Holland and Hannen in 1885-6, after Mr. J. MacVicar Anderson's plans and designs, by the inclusion of the site of Adair House, No. 1, George-street, by P. C. Hardwick (*obiit* 1892), for a frontage of 120 ft. to Pall Mall, an almost equal frontage to St. James's-square, and a west frontage to George-street. The south elevation was altered by shifting the position of the doorway, adding bays to the ground floor at each end, and carrying a balcony along the first floor level; on the north front prominent bay windows rise to the top of the first floor, surmounted with a balustrade. The United Service Club, by Nash, 1826-8, and enlarged on the east side by Burton, whilst one of the most commodious and comfortable clubs in this quarter, scarcely does justice to its situation. The New Oxford and Cambridge Club, No. 68, was built in 1873-4, after Mr. T. Dudley's designs, for the Junior Naval and Military Club, of which the lease for seventy-nine years, from July 5, 1873, at a ground rent of 550*l.* per annum, was bought on August 5, 1887, for 30,700*l.*, by Mr. Ashton Lever, who there founded the Beaconsfield Club; Nos. 67-8-9 were Kershaw's Hotel some forty years ago, No. 69 is now the London and Joint Stock Bank. No. 52, the Marlborough Club (1891), founded by His Majesty when Prince of Wales, occupies the site of a house built in 1789, by the younger Dance, for Alderman Boydell as his Shakespeare Gallery. The façade carried a large bas-relief, engraved for Boydell's "Shakespeare," of the poet attended by Poetry and Painting, for which Banks, the sculptor, was paid 500 guineas; in 1806 the gallery was opened as the British Institution, closed in 1870. The house was the home for a while of Benjamin L. Vulliamy (*obiit* 1854), who made the Post-office clock, and in 1816 renewed the Horse Guards clock (Thwaites, 1756), for which he employed a two-seconds pendulum (as Le Paute did in his clock at the Hôtel de Ville, Paris), and added a seconds-hand. (Confer Henri Robert's "Études sur diverses Questions d'Horologerie," Paris: 1852.)

The story of the War Office buildings is rather complicated. We will say briefly that to Matthew Brettingham is attributed the house, formerly No. 86, erected for George III.'s brother Edward, Duke of York, and since occupied as Cumberland House by the Duke of Cumberland. No 86 was subsequently opened as the Albion Hotel—a "subscription house," and the first of the more modern club-houses in Pall Mall. William Atkinson (*obiit* 1839), as architect, in 1813-29, to the Ordnance Office, either rebuilt or greatly altered the Albion, No. 91, for the Ordnance and Transport Departments who removed thither from the office in Cannon-row built by William Pilkington (not, as is generally stated, by Atkinson), and pulled down in 1900 for a police-station as an extension of "New Scotland-yard." The present War Office buildings consist of (*a*) Atkinson's, the middle block; (*b*) on the east Buckingham House, built by Soane for the Marquis of Buckingham in 1794 on the site of a house built by R. Furze Brettingham; (*c*) on the west a block [August 16, 1851] by Pennethorne, for which he pulled down the east wing of (old) Schomberg House; and (*d*) the middle portion and west wing of the last-named house. The name of Schomberg House is now borne by No. 78, a residence bestowed in the spring of last year upon Prince and Princess Christian instead of Bushey House in Bushey Park, on exchange by the Office of Works on behalf of the Royal Society, with the Land Revenues of the Crown. No. 79, Eagle Insurance Company, formerly occupied by the Society for the Propagation of the Gospel, stands on the site of a house built by Dr. Heberden, where had been the home of Nell Gwynn from 1671 until her death in 1687, of which she obtained a free conveyance from Charles II. It is commonly cited as the only freehold in the street, but Sir Robert Walpole, who at one time lived opposite Marlborough House, says he owned a freehold

(*Continued on next page.*)

* Confer also the article: "The Architectural Genius of Sir Charles Barry," by the Editor.—*Builder*, January 5, 1901.

Illustrations.

THE SENATE CHAMBER, DUCAL PALACE, VENICE.

THE view of this rich but rather *rococo* saloon is drawn by Mr. A. C. Conrade, who has drawn the details of the ceiling with much power, and has peopled the apartment with figures belonging to the period when the Venetian Senate was at the height of its power. Behind the Doge's throne is seen Tintoretto's picture of the deposition by angels, with the figures of two Doges kneeling.

DETAIL ELEVATION: PART OF ROYAL COLLEGE OF SCIENCE.

THIS is a reproduction of the large detail drawing of a portion of Mr. Aston Webb's building in Imperial Institute-road, which was exhibited at the last Royal Academy Exhibition.

There has unfortunately been an error in the lettering on the plate, which was printed some time back, and which gives the wrong ascription. The mistake was not discovered till too late to rectify it.

We have had it printed in two colours, so as to give more of the effect of the original drawing in the contrast between the red brick and the stone work.

A TRANSLATION.

IT has often occurred to me that it would be an interesting experiment to see how some well-known architectural composition in any well-marked style would look if translated into the details of another style. In this instance I have selected a great Gothic façade familiar to everybody, and "translated" it into Renaissance.

The wall-arcading on the towers in the Gothic original is not suggested in the translation; it would hardly come into a Renaissance tower scheme, and it is the weakest point of the original; the towers, to flank suitably that immense arcade, should have been as solid and unbroken as possible. A Renaissance architect, of course, would never have dreamed of building the central arch narrower than the other two; that is only done to retain an important fact in the original design.

It is perhaps as well to add (since some people will take one too seriously) that this does not imply any wish on my part that Peterborough had been built in Renaissance style. I am very well content with it as it is!

H. H. STATHAM.

A GENOESE DOORWAY.

THIS is a doorway in a house which was formerly a portion of a late Renaissance palace. It is a rich and pleasing composition—a niche within a niche—forming harmonious lines. The figure work is of a late or Baroque order.

A. C. C.

GROTTO IN THE CORTILE, PALAZZO PODESTÁ, GENOA.

THIS is an open façade to a grotto with running water; poor enough in the architectural part of the design, but redeemed by two very decorative caryatides, which support a scrolled shell. The whole suggests a background in a picture by Fragonard or Pater, either of whom it would have suited well to introduce into some composition.

A. C. C.

ABBEY OF ST. VICTOR AND PRIORY OF THE TOURNELLES, OLD PARIS.

THIS is the last of the drawings of the late Mr. H. W. Brewer which is in our possession, and in publishing it we feel very much the want of the valuable archæological notes with which Mr. Brewer always accompanied his drawings. As a Catholic, he was very well up in the history of the ancient mediæval establishments of London and Paris.

The locality is fixed by the name of the still existing Rue Tournelles, which runs into the Faubourg St. Antoine, just west of the Place de la Bastille. In later mediæval times there was on this site a Hôtel and Parc de Tournelles; the Place des Vosges is on the site of the Parc; probably the Priory preceded this. Of the Abbey of St. Victor we cannot find any record.

The Priory is (presumably) the low turreted building on the right, on the margin of one of the ditches, rather, than streams, which intersected this low-lying portion of old Paris.

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INTERIOR OF THE R.C. CATHEDRAL, WESTMINSTER.

THE drawing shows the interior as it appeared early in December. Since that time the great painted crucifix seen amidst scaffolding on the left of the picture has been hoisted in position over the entrance to the choir, suspended from three wrought-iron chains below the crown of the western arch of the "crossing." The preparations are also shown round about the altar that were at the time being made for the ceremony of the enthronement of the new Archbishop, which took place on Tuesday last. The curtains shown in the arcade on the right have also been removed, giving a view into the ambulatory and side chapels. In these side chapels a beginning has already been made with the marble and mosaic work that is intended eventually to cover the brick walls and concrete domes of the church. A chapel on the north side has been completed, and on the south side a chapel—a gift of Lord Brampton—is being rapidly pushed forward.

It may be many years before this great work of decoration is complete; meanwhile, the simplicity and great scale of the interior has an impressive effect in itself, which will perhaps not be surpassed by the more gorgeous effect which will be produced when the scheme of the late Mr. Bentley has been carried out in its entirety.

ELECTRA HOUSE, FINSBURY.

THE three illustrations give a good idea of the fine and dignified building which Mr. Belcher has erected at Finsbury. The elevation was specially drawn from materials furnished to us by Mr. Belcher; the general view and the detail of the doorway are from photographs.

THE ORLEANS RAILWAY TERMINUS, PARIS.

THIS is a good example of what may be done with a railway station when a company are minded to make a good thing of it, and will employ a first-rate architect, as French railway companies will, instead of getting a commonplace front made by their engineer.

The station occupies the site of the old Cour des Comptes, which so long stood as a blackened ruin since its destruction in the Commune riots. It was completed, or nearly so, at the time of the 1900 Exhibition. The public enter directly from the Quai into the booking halls, and descend by stairs to the station platform, which is far below the ground level. The effect of the semicircular panelled roof, with bands of light at intervals, is very good. The building is largely decorated, externally with sculpture, internally with paintings, by many of the first sculptors and painters of the day.

SCULPTURE: "LES DANAÏDES."

THIS fine work was one of the central objects in the sculpture hall of the Paris Salon last year; we commented on it specially at the time in our review of the Salon. M. Jean Hugues is the sculptor.

The reader should notice the poetic significance, in connection with the hopeless task of the Danaids, of the melancholy heads, and the chains festooned from one to the other, which form the decoration of the rim of the basin.

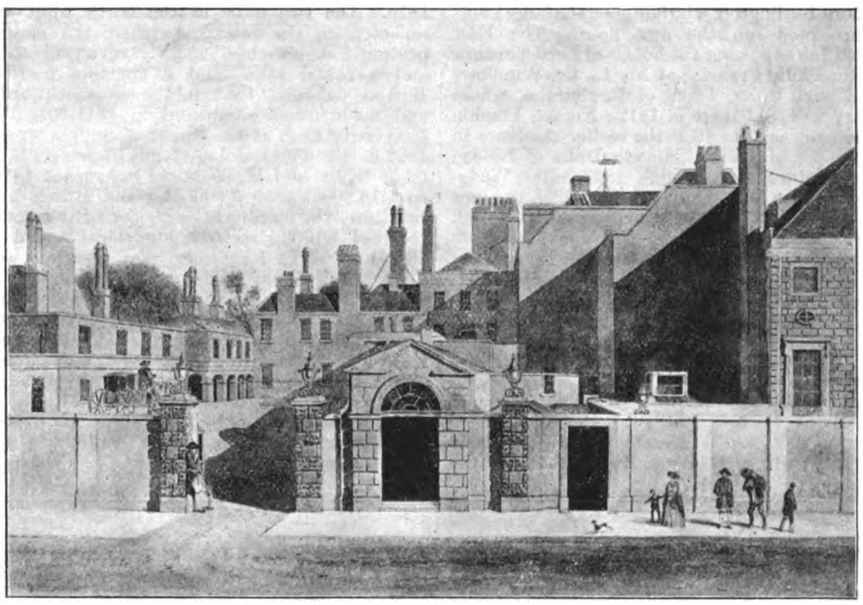
DECORATIVE PICTURE: "CHARITY."

THIS is the design which gained for its author, Miss Lilian Price-Edwards, the Royal Academy's prize for a painting for the decoration of a public room. We have already remarked upon it in our recent review of the Academy students' designs, and need not repeat what we then said.

EMPIRE FURNITURE AT THE BRITISH EMBASSY, PARIS.

THE furniture illustrated is part of the collection included in the Garde Meuble of the French Government, and was transferred to the British Embassy at the time of the visit of the King of England to Paris.

It is all of the period of the First Empire, when a Roman fit came over France in regard to the design of furniture and fittings; and though there may be something too much of ostentation about it, and it is not in the best style of art, it nevertheless possesses a stately and a sumptuous character worthy of that extraordinary period when France had for her ruler one of the greatest geniuses the world has ever seen.



Carlton House Entrance in 1734.

OLD LONDON VIEWS IN THE REGENT-STREET NEIGHBOURHOOD.

THESE views, which are reproduced from drawings and engravings in the Crace collection, are given in illustration of the article in this issue which describes the changes in this part of London during the past century. The view of old Carlton House goes beyond our period, as it dates from 1756; but it is an interesting contrast to the modern Carlton House below. It is from a drawing by Capon, showing the altered front as seen from within the forecourt, before Sir Robert Taylor had cased the red brick with stone. The indication of the cobble-stone paving for the drive is characteristic of the period.

We append here an illustration showing the entrance to Carlton House from Pall Mall as it appeared in 1734, when occupied by Frederic Prince of Wales. The colonnade of the new Carlton House took the place of the gates, piers, and walls shown in this illustration.

The other views in the plate speak for themselves.

(*Continued from page* 12.)

in Pall Mall that he gave to his son Edward, being, it seems, that which, as No. 62, was sold for 21,000*l.* at the Mart on November 17, 1897; on February 9, 1894, was offered for sale No. 49, described as a freehold building estate.

The foundation stone of Marlborough House is inscribed—"Laid by Her Grace the Duchess of Marlborough, May the 24 June the 4th 1709." Her descendant, the third duke (*obiit* 1817), added the second floor to Wren's building for which Dutch bricks had been used; his successor erected the riding-school which in 1863 gave way to the stabling of forty-five stalls and twelve loose boxes (Smith and Taylor, contractors), by Pennethorne, who made extensive alterations in the main block; in 1885 a floor was added to each wing, and the balustrade was removed. At the renewal of the lease by the Crown for fifty years in 1785 the house, standing in 2½ acres of ground, was valued at a rental of 600*l.*, six years ago it was rated at 4,449*l.* In 1824 George, fourth Duke of Marlborough, sub-let the house to Prince Leopold, who lived there until his call to the Belgian throne in 1831. At the expiration of the lease the property was acquired for Queen Adelaide, who resided there until her death in 1849. In 1850 it was settled upon Albert Edward, Prince of Wales, who went into residence on his marriage in 1863. Meanwhile the Vernon Collection and other pictures of the English School had been removed into the ground floor rooms after Queen Adelaide's decease. In 1852-3 the upper rooms were appropriated to the Schools of Design and the Department of Practical Art, of which Sir Henry Cole was superintendent—the exhibits consisting mostly of purchases from the Great Exhibition and casts from the schools established in 1836-7 at Somerset House under the Board of Trade; five years later the Schools of Design migrated from Marlborough House to South Kensington, and in 1859 the pictures also were removed thither.

On the north side are the Alliance Insurance Offices, by Mr. R. Norman Shaw, R.A., and having a sign [November 14, 1885] hand-forged in iron by Alfred Newman; No. 29, the Royal Exchange Assurance Offices, by Professor Aitchison [August 15, 1885], with a frontage in St. James's-square; and Messrs. Foster the auctioneers' premises, by Messrs. Karslake and Mortimer, 1890. The front of Nos. 16-7 was designed, we believe, by Sir Charles Barry, for the Imperial Fire Insurance Company; the new premises by Mr. E. Williams, for Wilkinson's Sword and Equipment Co., established in 1772, stand on the site of Nos. 27-8, Pall Mall, and Nos. 24-5, St. James's-square. Carlton-mansions, by Messrs. Joseph and Smithem, 1892, displaced No. 14, Colt's Firearms Co., by E. I'Anson (*obiit* 1888); the site of Nos. 13-4-5 was let on July 17, 1891, on an eighty years' building lease for 1,525*l.* per annum, equivalent to 8s. 1d. per sq. ft., or a fee simple at, say, thirty years' purchase of 528,150*l.* per acre. On the south side is a block, Nos. 122-4 [June 4, 1881], designed by A. M. Peebles, City Architect (*obiit* 1891), for the Life Association of Scotland.

St. James's Square, 1665 (see lithograph).—To the discomfiture of students of London topography, all the houses, Nos. 1-7 excepted, were renumbered in November, 1884, and Nos. 24-6 have since been absorbed; we have not space to follow the changes thus involved: the chief structural alterations are on the west and south sides. Cleveland House, formerly No. 17, owned by the Vane family since George I.'s time, was sold after the death of the last Duke of Cleveland by his heir, Lord Barnard, in May, 1894, for, it is said, more than 60,000*l.* The site, 11,300 ft. superficial, is that of a block of shops and offices, No. 19, built by Messrs. Holloway Brothers from designs by Messrs. Rolfe and Matthews, and occupied, in part, by the War Office. The London Library (1840) was removed in 1845 from No. 49, Pall Mall, to Beauchamp House, of which house (shared until 1874 with the Institute of Actuaries and Statistical Society) and of premises in Duke-street in the rear the subscribers bought the freehold in 1879 for 21,000*l.* On December 5, 1898, were opened the new and enlarged premises erected at a total cost of 19,445*l.* after designs by Mr. J. Osborne Smith, Messrs. W. Cubitt and Co. being the general contractors for 17,338*l.*; the front of Portland stone cost about 1,400*l.* On the south side have been built the north fronts of the Junior Carlton Club, the Royal Exchange Insurance Offices, No. 23, by Professor Aitchison, and Wilkinson Sword Co.'s on the sites of Nos. 24-6, already cited. Earl de Grey, President in 1839, used to receive the Royal Institute of British Architects at No. 4—the house, since inherited by Lord Cowper from the Greys, Earls of Kent, had been remodelled after a fire in 1725,

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by Lord Burlington, who designed the large Louis Quinze room on the first floor. The East India Club supplants the homes of Lord Thurlow and Sir Philip Francis; at No. 13, the Windham Club, lived John, Duke of Roxburghe, whose library was sold there in 1812; No. 32, London House, replaced in 1820 the earlier residence in the square of Thomas, fourth Duke of Leeds; the "Picture of London," 1823, cites Wedgwood's glass and china shop, which is now No. 8, the Sports Club. In 1890 the Portland, until 1825 the Stratford, Club migrated from their house, since rebuilt, in Stratford-place, W., to No. 9, which is part of the house of James, second Duke of Ormonde, who died in exile in 1745, and afterwards of the Duke of Chandos. Johnson refronted with stucco, after the Italian manner, No. 18, formerly No. 16, Lord Castlereagh's; in 1805-19 Soane altered and enlarged for the Earl of St. Germans the house now Lord Derby's; in 1877 the War Office gave 46,300*l.* for Winchester House (formerly No. 19), built by R. Furze Brettingham for the 1876. The two antæ of the north front are repeated on the east side, where the middle portion has also two slightly-advanced antæ and a raised attic and a receding portico. Burton enlarged the club-house southwards, and made other alterations in 1841-50. The University Club at the corner of Suffolk-street, 1822-6, by Peter John Gandy-Deering, R.A. (*obiit* 1850) and W. Wilkins, R.A. (*obiit* 1839) cost 16,800*l.*, with 5,500*l.* for the fittings and furniture, the architects and clerk of the works received 1,100*l.*; an attic story was added in 1850-1. No. 1, Ransom's, now Barclay and Co.'s, bank is by William Atkinson; F. P. Cockerell remodelled the interior and designed the front of No. 5A [April 24, 1875] for the Royal Society of Painters in Water Colours, who held their first exhibition at No. 20, Lower Brook-street in April, 1805, in rooms built by Vandergucht. The sculpture in the new front, of Portland stone, is by Signor Fabrucci. Burton built some houses and shops in 1822-8; the house now numbered 19, and 1, Cockspur-cast-iron fluted columns, with cornice and balustrade and an entablature of Bath stone, along the whole south side extending over the footpath, and a similar but shorter colonnade between two arcades in stuccoed brick along the east side. Thus they skilfully overcame the fall of nearly 7 ft. on the Haymarket side, as the arcades admitted of easy changes in their proportions, and enabled them to break the levels of the cornices at the divisions; they omitted the cornice from above five of the six arches at the lower end on that side. Bubb designed for the east front the basso-relievo, executed in lithargolite, of the Progress of Music with central figures of Apollo and the Muses. For Thomas Holloway, the ground-landlord, Nash and Repton added the western arcade, in which was the entrance for sedan-chairs, on land he leased from the Commissioners; those improvements, comprising the shops along the north and south, cost about 50,000*l.* Having been burned out on December 6, 1867, the Opera House was reconstructed for the late

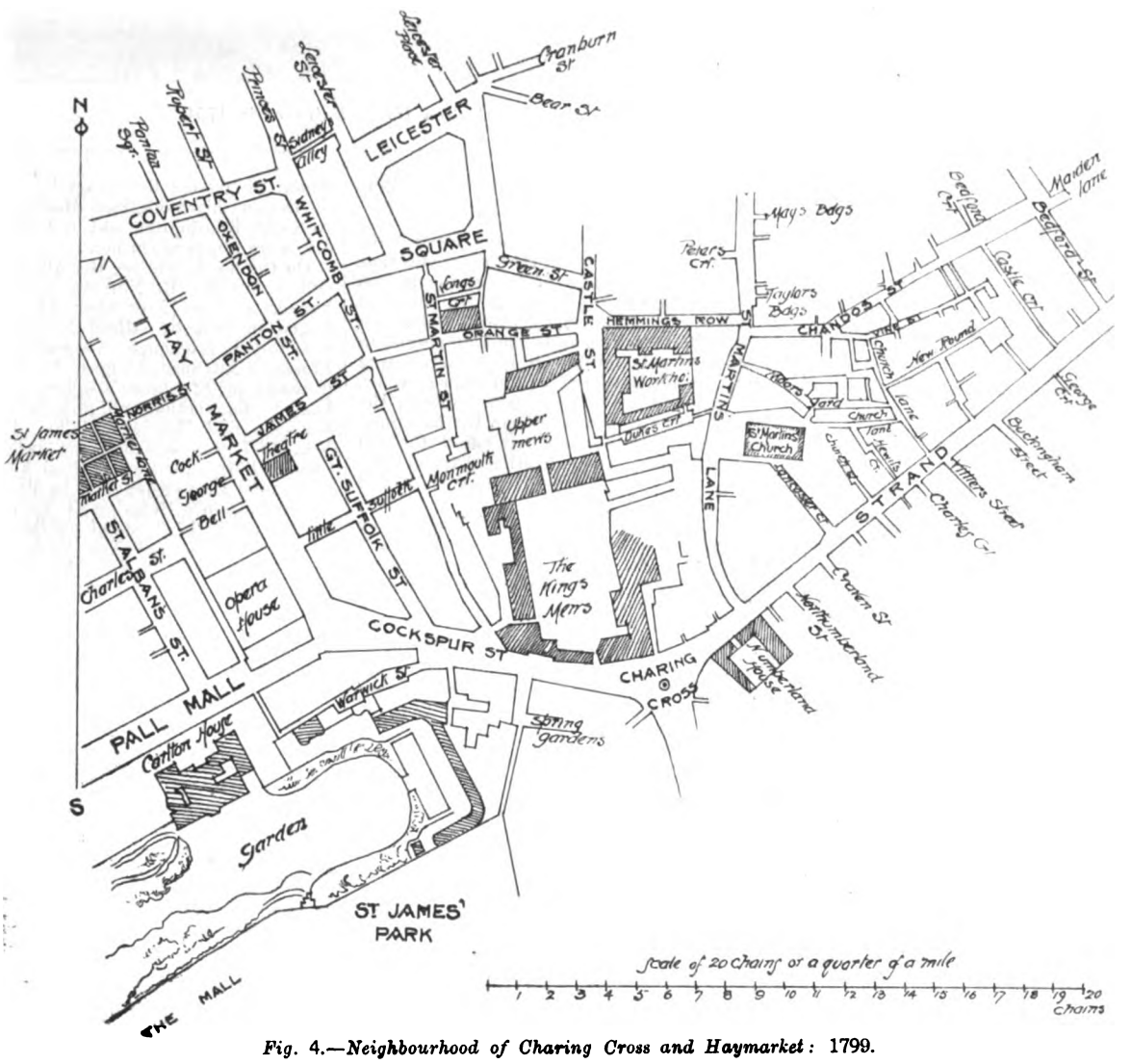

Fig. 4.—Neighbourhood of Charing Cross and Haymarket: 1799.

fourth Duke of Leeds; and to the sixth Duke of Leeds at No. 3 succeeded in 1838 the Tithe and Copyhold Commissioners, who, as in later days the Land Commissioners, were merged, 1889, in the Board of Agriculture. No. 3 is ascribed to Soane, who in 1815 altered and enlarged Lord Hardwicke's. The equestrian figure of William III., by Bacon the younger, was set up in 1808 on the pedestal that had been placed in the central basin in 1732; Samuel Travers's will was disputed in Chancery during more than one hundred years; his bequest made in 1724 became forgotten until an accidental discovery of the money in a list of unclaimed dividends.

Pall Mall East and Suffolk-street.—The College of Physicians, opened in July, 1825, and the Union Club, both by Sir Robert Smirke, form one group; the College, which has a hexastyle Ionic portico and a library lighted with three elegant lanterns, cost 30,000*l.*; the statues of Linacre, Harvey, and Sydenham in the niches are by Henry Weekes, R.A., street, facing westwards, is by Henry Rhodes (*obiit* 1846), architect and surveyor to the Woods and Forests. In Suffolk-street, on the east side, is a house once occupied by Cresy the architect, designed after that of Andrea Palladio at Vicenza; in 1823-4 Nash and Elmes built the Gallery of the Royal Society of British Artists, the Roman Doric portico being by Nash, and the galleries by Elmes.

Haymarket (Fig. 4).—The original Opera House or King's Theatre (see lithograph), by Vanbrugh, was opened by Betterton on April 9, 1705. That house, of which Robert Adam rearranged the interior in 1782 for Michael Novosielski, was burned in July, 1789, being then Ridaud's fencing academy. Novosielski entirely rebuilt the house upon an enlarged area in 1790-1, introducing the continental horse-shoe shaped auditorium, with the stage to the south and a concert-room to the east. Repton and Nash greatly altered the exterior in 1816-9. They built a Roman Doric colonnade, having Lord Dudley, as lessee, by Messrs. George Trollope and Sons, who completed the work in nine months, at an outlay of 50,000*l.*, after designs by Lee. In 1874 the premises were offered for sale; in the following year Messrs. Moody and Sankey hired them for their "revival" services. On May 30 and June 15-6, 1892, the materials and effects of Her Majesty's Theatre, the United Hotel, Nos. 70-1, Haymarket, and No. 1, Pall Mall, were sold at auction. A highest bid of 140,000*l.* was refused on July 25, 1894, for the vacant site of 37,440 ft. superficial, with a Crown lease for seventy-six years unexpired at a yearly ground rent of 4,200*l.* C. J. Phipps (*obiit* May, 1897) made plans and designs for a theatre, with a hotel, restaurant and café, on the site. The theatre [May 8, 1897, two-page view] having a frontage of 86 ft. to the Haymarket, a depth of 150 ft. from north to south, and accommodation for nearly 1,600, was opened by Mr. Beerbohm Tree as Her Majesty's Theatre on April 28,

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1897. There are two separate staircases and exits for each part of the house, the auditorium is unusually wide; over the proscenium opening, 35 ft., is a lintel of a solid baulk of fir, with a brick relieving arch turned over, and, as a precaution against the spread of fire, a wide clear space exists between the proscenium wall and the wall that carries the roof of the auditorium; the stage has no rake and is 60 ft. deep. Mr. R. Walker was associated with Phipps for the internal decorations and colour scheme, the general builder's work being by Mr. H. Lovatt, at a cost of about 55,000*l*. Mr. L. H. Isaacs and Mr. H. L. Florence completed the fabric of the Carlton Hotel in Pall Mall (opened on July 15, 1899) after Phipps's drawings, with modified plans for the interior; the decorations and equipment were by Messrs. Waring and Gillow. C. J. Phipps entirely rearranged for Sir Squire Bancroft the interior of the Haymarket Theatre, which Nash had built, 1820-1, for Morris and Winston, successors to George Colman the younger, on a site measuring 61 ft. by 135 ft., a few feet south from that of John Potter's New French Theatre, opened on December 29, 1720, and since known as the Little Theatre (see lithograph). Of the famous snuff and tobacco shops in this quarter No. 34, Haymarket, Fribourg and Treyer's, has its original double-bowed front; Fribourg and Pontet removed from the Rasp and Crown, No. 124, Pall Mall, to No. 23, Haymarket, in or about 1880; Claude Pontet succeeded Fribourg, his father-in-law, at a shop near the Opera Colonnade, north side of Pall Mall; Frank Pontet retired from business at No. 24, Cockspur-street, some fifty years ago. No. 21, Coventry-street, by the sign of the Highlander, Thistle, and Crown, opened by David Wishart on December 31, 1720, the day of Prince Charles Edward's birth, is believed to be the first that displayed a figure of a Highlander, and was a favourite resort of Jacobites; the house was pulled down for the widening of Coventry-street in 1880-1. The reconstruction of No. 16, James-street in 1887 practically destroyed what there can be little doubt was the Tennis Court (Fig. 5) belonging to Shaver's Hall, the gaming-house occupied *temp.* Charles I. by Simon Austbiston, barber to Philip, Earl of Pembroke and Montgomery. A survey made in 1650 of Shaver's Hall, with its bowling-alleys, walks, orchards, and other appurtenances, covering about 3½ acres between Coventry-street and "the Earl of Suffolk's brick wall south," cites "one faire Tennis Court very strongly built with Brick and covered with Tyle." At the Institute are two sectional drawings of the Tennis Court, conspicuous for its massive cornice, and converted in 1886 into a military clothier's depot. The premises next east, by Mr. D. Cubitt Nicholls, 1890, replace an old timber-fronted house, known as the Barn. The Comedy, formerly the Alexandra, Theatre in Panton-street [June 18, 1881], by T. Verity (*obiit* 1891), is planned without corridors, so that an audience of 1,200 can quickly pass out into fire-proof staircases or the two streets, each part of the house has two or more separate means of egress, and the dress circle is entered from the street level through a vestibule; on the site stood a house where Addison wrote "The Campaign."

Coventry-street.—Pennethorne opened the east end into Leicester-square for the Woods and Forests in 1843-4. Under their Act 40-1 Vict. c. 235, the late Metropolitan Board of Works widened the street from 40 ft. to 60 ft. along its south side, and Princes, now Whitcomb, street, on its west side, between Coventry and Panton streets; the net cost of the improvements, completed in April, 1881, by Nowell and Robson, contractors, amounted to 100,446*l*. Scott's restaurant, by Messrs. Treadwell and Martin, 1893-4, at the corner of Great Windmill-street, marks the site of Piccadilly Hall,* whereof the tennis court, as converted into the Argyll dancing-rooms, has given way to the Trocadero, one of the well-nigh countless restaurants which during the past thirty or forty years have been erected in the locality.

SOME NOTABILIA.

Regent-street (*East Side*).—14, Nash, until he retired, 1831, to East Cowes Castle, which he built for himself; he died there, May 13, 1835. Opened as the Gallery of Illustration, 1849, by Grieve and Telbin for their diorama "The Overland Mail"; Mr. and Mrs. German Reed; Junior Carlton Club; Pall Mall Restaurant; Junior Constitutional Club. 16, Parthenon Club; Raleigh Club. Argyll Rooms: Philharmonic Society, 1813, until the fire of February 6, 1830. *Great Marlborough-street.*—49, Mrs. Siddons, removed, 1804, to Princes-street, Regent-street: site taken for St. John the Baptist Church—Sir A. W. Blomfield. *Argyll-street.*—30, Mme. de Staël; 9, Argyll House, the Duke of Argyll, who sold it to Lord Aberdeen; site of the Cirque, or Hengler's Circus, 1872; opened January 11, 1896, as the National Skating Palace.

Regent-street (*West Side*).—New Gallery, on site of Newman's livery and bait stables; opened May, 1888. Burlington Restaurant, site of the White Horse. *Conduit-street.*—Limmer's Hotel, rebuilt in or about 1895; "May 2, died, aged 58, Mrs. Limmer, of the Prince of Wales's Coffee-house in Conduit-street, Hanover-square" (*Gentleman's Mag.*, 1807). *Beak-street.*—1-13, Blanchard's, one of the last of the old-time restaurants; pulled down 1900. *Langham-place.*—All Souls' Church, built at the cost, 15,994*l*., of the Commissioners; picture on east wall, Christ crowned with thorns—R. Westall, R.A.

Pall Mall.—First lighted with gas by Winsor, 1807; the original title-deeds of Nell Gwynn's freehold bought at the sale of A. Daly's library in New York, March 18-24, 1900; her looking-glass at the Army and Navy Club. At (old) Schomberg House, after Cosway, miniature painter (1799), the Polygraphic Club; Mrs. Abington, died March 4, 1815, "at her house in Pall Mall"; No. 25, Scott visited Lockhart in 1826-7—front altered; Dillon's print-shop—the Royal Academy schools opened there on January 28, 1769; 59, site of the Smyrna Coffee-house, *temp.* Anne; 50, Robert Vernon, his collection of pictures; Kelly's Saloon, at south end of Opera Colonnade; road into the Mall passing the Friary Court, made 1850; Queen's Chapel, since the German Chapel Royal; the Guard House, St. James's Palace, S. P. Cockerell (*ob.* 1827); statue of George III., 1837—M. C. Wyatt.

Carlton House-terrace.—John Crockford, 1840, until his death in 1844, on retiring with a reputed fortune of 1½ millions from his gambling-house in St. James's-street; W. E. Gladstone, at 11, in 1857-77, at 13 (the house of his wife's mother, Lady Glynne), and at 21 (Lady Frederick Cavendish's); 18, the late Lord Granville, who sold his interest, 1887, to Mr. de Murrietta for 60,000*l*.; No. 16, decorated throughout for the late Mr. Alfred Morrison by Jackson and Graham after an entire scheme in cinquecento style by Owen Jones, who completed the work just before he died in April, 1874. *Waterloo-place.*—5, Geo. Robins, auctioneer; Rivingtons quitted 3 in 1890; 11, James Hogg lodged on the second floor in the winter, 1831-2; Guards' (Crimea) Memorial—John Bell (*ob.* 1894).

St. James's-square.—Windham Club, 13, formerly 11; 10, formerly 8, Lady Blessington; 12, formerly 10, W. E. Gladstone, 1890; Pall Mall Club; Blenheim Club; 8, Wedgwood's; Erectheum Club, Junior Oxford and Cambridge Club; the Sports Club; Junior Travellers' Club (to 12, Grafton-street in 1892); the earlier houses on the north side, at first called the Piazza, erected on land of Henry Jermyn, Earl of St. Albans, by Abraham Cowley and Baptist May, under a warrant dated September 23, 1664.

St. James's Market.—Established 1666 by Henry Jermyn, Earl of St. Albans, the chief meat and poultry market for the west parts of the town. Home in their girlhood of Nance Oldfield (at the Mitre tavern), of Emma Harte (Lady Hamilton), and, at the east corner house on the south side of the poultry market, abutting on Market-lane, of Hannah Lightfoot, the Quakeress; T. F. Dibdin founded the Roxburghe Club at the St. Alban's tavern, St. Alban's-street.

Haymarket.—Opera House, first performed in London Handel's "Rinaldo," 1711, "Acis and Galatea," 1732, "Israel in Egypt," 1739, "Belshazzar," 1745, etc.; Mozart's "Tito," "Figaro," and "Don Giovanni"; Rossini's "Semiramide" and "Zelmira," 1824, and "William Tell," 1839. The sale of hay which had continued during 300 years transferred to Cumberland Market, 1830. *James-street.*—Tablet, with date "1763," not in its original place: Tennis Court (interior), T. Blake's print, 1825. *Coventry-street.*—17, J. B. Papworth (*ob.* 1847); 6, J. B. Cramer; Lambert's, old shop-front, founded, at the sign of the Golden Cup, by Peter Archambo, goldsmith.

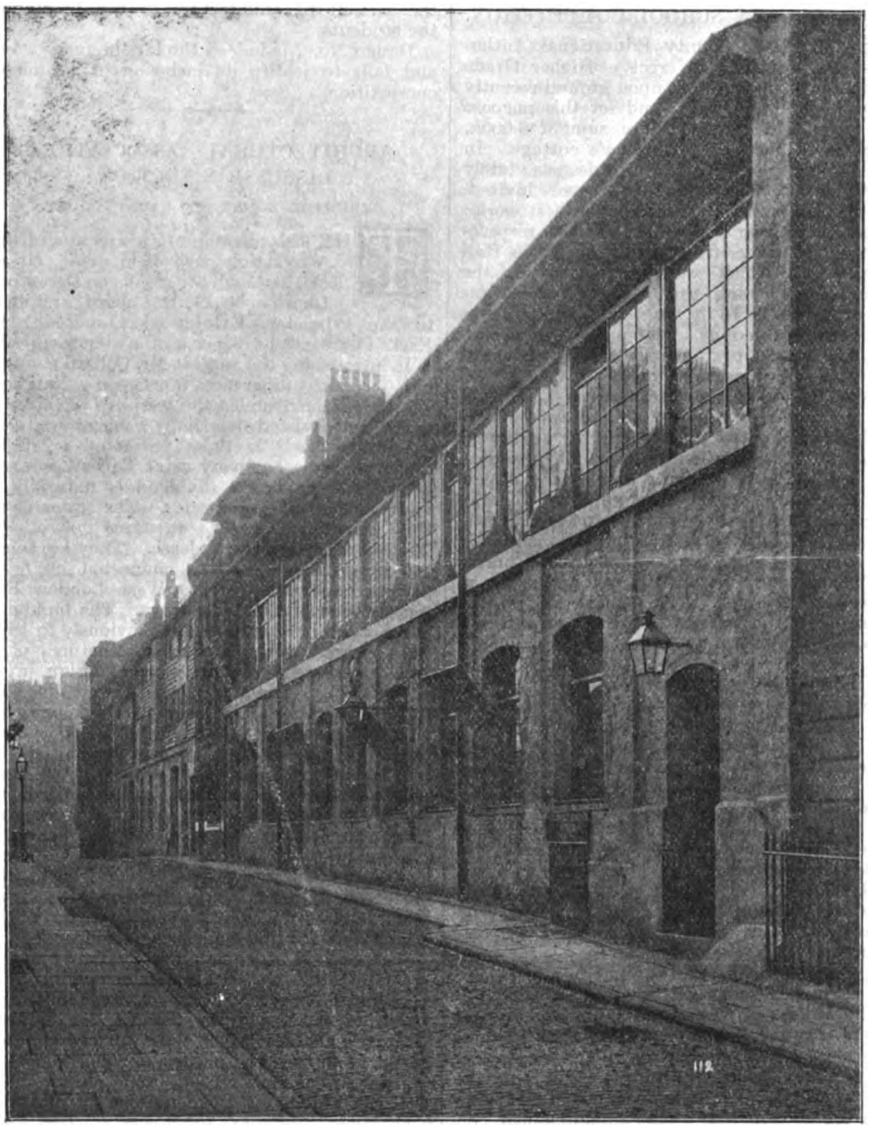

Fig. 5.—The Tennis Court, James Street, Haymarket: Pulled down 1887.

* Porter's very rare map, of about 1660, clearly marks the exact position of Piccadilly Hall and Shaver's Hall.

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ACTON COUNTY SCHOOL COMPETITION.

THE Middlesex County Educational Authorities are proposing to erect a Higher Grade School for boys at Acton, upon ground recently acquired for public uses, and for this purpose they have agreed to spend a sum of 8,000*l.*, which is to include a caretaker's cottage. In the limited competition for designs lately concluded, seven competitors were invited, and small premiums offered for the best work; we are pleased to observe that in two respects this contest differs from the Acton Town Hall competition, which we also review in the current issue; first, the scale laid down for the drawings is 16 ft. to 1 in., which saves an enormous amount of labour; and, second, that the award of the assessor, Mr. Leonard Stokes, is one with which we agree.

Generally speaking, the designs submitted are of an inferior quality and disappointing; we had anticipated greater efforts, worthy of the important educational movement of to-day, which would have produced dignity and directness of purpose in the new buildings, thereby extending an educative influence to the students.

Mr. A. H. Tiltman merits the first place with a Tudoresque brick and stone design, simple yet pleasing in its detail, and well suited to the materials employed. The central hall is the basis of all the schemes, and in the selected plan, class-rooms and masters'-rooms surround this large department on the ground floor, two laboratories and the art-rooms, with eastern aspect, are approached from a gallery on the first floor, whilst the dining-room and kitchen are in the basement. We could have wished to see the large hall freed from low buildings, but in this case the feature is prominent enough to convey an idea of the character of the institution. The site is a large one, with an irregular eastern boundary, and will be intersected by a new road connecting Mill Hill-lane with High-street; the author wisely places his buildings on the smaller half, reserving the greater part for playing fields, and thereby ensures several advantages to the class-rooms. The drawings are nicely rendered in pencil, the plans only being coloured.

The author of the second premiated design, Mr. W. Pyewell, contributes alternative schemes —one-storied and two-storied. It is the latter, we presume, which has merited this place in the award, for the one-floor structure is so spread about that the maintenance on roofs alone would be a perpetual trouble. The plan is workable, but the elevations have meaningless details, not calculated to train the youthful mind in the way it should go. Although the drawings are carefully inked in, they are wanting in strength.

The third premiated position is given to Messrs. Giles, Gough, and Trollope for a conception which is open to improvement in the matter of aspects. It will be seen that the high buildings will shield the lower parts from sunlight; the class-rooms facing north, however, are right in aspect. A classic note is struck by the semi-circular open stone porch, whilst there are other points to be commended in the scheme.

The names of the four remaining competitors were not disclosed. Drawings marked No. 1 represent a pleasing design, which has perhaps too domestic an influence, chiefly derived from the windows and parts covered with tile hanging. A defect in the planning, however, is the placing of the cloak-room and lavatories, with a single inconvenient approach, in the basement; this would involve very considerable initial excavation according to the section, a perpetual noisy use of one staircase, and deprive these places of air where an ample easy circulation is imperative.

One side of the central hall is clear of smaller erections. The drawings, including the perspective views, are excellently rendered.

No. 5 is too cramped in cloak-room accommodation; the central hall has galleries on three sides to provide access to class-rooms, dining-room, kitchen, etc., on the first floor, an arrangement which has caused the laboratories to find space on the ground plan, which is the reverse of the more desirable positions. The Head Master, whose room is 9 ft. wide, would have our sympathy.

In many respects No. 6 has a good plan in which the laboratories and dining-room are on the lower level, and class-rooms arranged on two floors; staircases and cloak-rooms are convenient, but the elevations, which have slate roofs, would not inspire a yearning for the pursuit of architecture in the hearts of the students.

Design No. 7 is indeed the last in every way, and fails to justify its inclusion in a limited competition.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION:

EXHIBITION WORK AT EARL'S COURT.

THE fifth meeting of this section of the Association was held at 56, Great Marlborough-street, W., on December 16, when Mr. A. O. Collard, architect to the "London Exhibitions, Limited," at Earl's Court, read a paper on the above subject.

In introducing the subject Mr. Collard pointed out certain differences between National exhibitions held under the auspices of governments and assisted financially if necessary, and exhibitions such as those promoted regularly each year by a company as at Earl's Court, to whose shareholders a dividend is naturally a matter of great importance. The grounds of this company occupy an area of about 25 acres, held on a long lease. They are separated into three portions connected by footbridges over the District, West London Extension, and Midland Railways. The buildings which stood on these grounds previously to 1895 were cleared away, and new structures of a wholly different character and design were substituted. Interesting details were given of the considerable architectural staff engaged in 1894 in preparing plans for the first year's exhibition in 1895; of the contracts, of the hundreds of men employed direct by the company, under a permanent superintendent of works, and of the English, French, and Belgian men who produced such varied and beautiful plaster work. Reference was made to the necessity of changing the external designs of the various buildings annually, to accord, as far as possible, with the title and characteristics of the exhibitions for the time being, independent of the erection of new buildings by the company or concessionaires. Some of the buildings are permanent structures, and others temporary, requiring licences from the London County Council. Of this latter class the construction ranges from steel and plaster, or steel, wood and plaster, to simple wood and plaster. Mr. Collard exhibited a large number of drawings and photographs as specimens of the work executed during the past nine years, and gave numerous details of construction and cost. The large building known as the Empress Theatre, which is second only to St. Pancras Station in having a roof in one span of 220 ft., especially interested the meeting. Its dressing-room accommodation for 1,000 performers, its staging and tank available for immense spectacular shows on land or water, were dwelt upon, as well as its special construction of steel, brickwork, and concrete slabbing, and its cost, complete, of about 2d. per foot cube. Mention was made, too, of the large extent of open-air scenery, rendered necessary to shut out the sight of ugly surroundings and to insure privacy. Much of this scenery has frequently won high praise from other artists and the public. Finally, the public authorities and their officials who have to administer various laws and regulations affecting public entertainers were genially criticised; and the Theatres and Building Act Committees of the London County Council, who are perhaps the most important from the architect's point of view, were described in appreciative terms for their courtesy and common sense.

Mr. W. Wonnacott, who opened the discussion, referred to the Paris Exhibition buildings of 1900, where there had been much to learn in the way of the economical use of materials. Particularly was this so in the treatment of summer houses and trellises, and in the skylines of domes, finials, etc. The finials were but sawn work, and no two domes seemed to be alike in design. But Mr Collard had shown what could be done in England without Government aid, and in this connexion the details of cost as given to the meeting would be most useful for reference.

Mr. A. H. Belcher thought that the 25 acres of ground covered by the Earl's Court Exhibition entitled it to rank as one of quite respectable size, and he envied the fortunate architect who might be asked to go to Egypt, India, Italy, or elsewhere to get up schemes for prospective exhibitions. There was, besides, the incentive to dive into the literature of the country at home, and Mr. T. C. Gotch's book "Art in Costume" would probably be studied in this connexion. Mr. Collard had shown where the foreign plasterer came in, as against the English. As regards plaster work for temporary buildings, he thought the annexe to the west end of Westminster Abbey at the time of the coronation of King Edward VII. was a particularly good example.

Mr. J. H. Tyars referred to the business-like methods adopted by Mr. Collard in the management of the works at Earl's Court, where the wisdom of insisting upon having contracts for all work done had kept things square where there would otherwise have been hopeless confusion, the contracts at one time numbering thirty-two.

Mr. Banister F. Fletcher, who attended as special Visitor, said he could not lay claim to any special knowledge of exhibition work except so far as his visits to the Paris Exhibition of 1889 and the Chicago Exhibition, 1893, had carried him. At Paris the work struck him as being original in design and free from the trammels of French tradition. The trellis treatment of the ironwork in colours of blue and terra-cotta was particularly notable. At Chicago, on the contrary, where original developments were naturally expected and looked for, the work was, as regards the façades, disappointing, being little more than a translation from the studios of the École des Beaux Arts. At Chicago there had been much to learn in the way of timber construction. Steel construction was used only in the roofs, and not always there. The structural framing of timber in comparatively light scantlings was quite different from and much in advance of English methods. He thought that the public authorities here might well permit a less permanent form of construction in temporary buildings than that which they at present enforced upon exhibition builders. Why should not timber, properly isolated and cased with plaster, be allowed instead of the elaborate steel work which the authorities insisted upon at present? Mr. Fletcher also referred to "staff" as an admirable form of plaster; he had happened to have seen it made, and he described its uses and adaptability for exhibition work. As regards the Empress Theatre at Earl's Court, he had been much interested in the diagrams and description of the building, which he thought almost attained to the level of a Roman amphitheatre in the impression of size, space, and dignity which it gave.

ARCHITECTURAL SOCIETIES.

INSTITUTE OF ARCHITECTS OF IRELAND.

THE Institute of Architects of Ireland held their annual general meeting (the report of which was sent too late for us to find space for it last week) at 20, Lincoln-place, Dublin, on the 17th ult. The President, Mr. G. C. Ashlin, read a short address, chiefly concerned with the question of Registration. He remarked that when they came to consider the adoption of an obligatory examination for their members in the future, they felt that there was little chance of this being generally submitted to unless it was accompanied by State recognition, as in other professions. On this point, as well as on the general question of the urgency of registration, their views were shared by the Ulster Society of Architects, and, therefore, as far as the profession was represented in Ireland, there was practically no difference of opinion. Many of them had read the admirable address delivered on many questions of general interest by the President of the R.I.B.A. at the opening meeting in London this year, in which he dealt with this subject at great length, and avowed himself a non-supporter of registration "for the present," and enumerated all the objections to it from that point of view. They might take this pronouncement as embodying everything that could be said against it. His first argument was that Parliament would never grant compulsory registration as long as there is a considerable body of opinion strongly against it, including its leading members. The force of this objection would mainly depend on the numbers on each side, as our legislators could hardly refuse a measure based on the principle already recognised in the case of other professions, if it was supported by a substantial majority of the practising members. The next objection put forward was that it would be a difficult and serious task to decide who should be admitted and who should be excluded, and further, that a good deal of disability as well

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as ability might be registered in the first instance. This was, of course, true, but precisely the same difficulty existed in the case of other professions, and it had been successfully overcome; moreover, any injurious effect would be exceptional, and would disappear after a few years. In the meantime it would be surely of advantage to separate in even a rough and ready manner, in the words of the President of the R.I.B.A. "the sheep from the goats." The next objection was that speculative builders, auctioneers, &c., would still continue to design buildings, and that some of them might qualify themselves under a Government diploma and thus make the condition worse than it is.

Referring to the first point, this could not, of course, be avoided, but the distinction between a qualified and an unqualified practitioner would remain for the guidance of the public and our local representative bodies. With regard to the second point, the necessary training and study to obtain the diploma must result in some benefit to Architecture in the abstract. As to the argument that art should be free and that registration would tend to shackle it, it was hard to understand how this would result. The profession would be open to everybody who qualified himself, and certainly the possession of heaven-born gifts as an artist would not be considered a disability in a candidate. As to saying that painters, sculptors and engineers did not seek Government diplomas and still their professions were more allied to Architecture than law and medicine; with regard to the first two professions there appeared to him no analogy at all (!), their works told for themselves from the start and required no hall-mark, whereas the Architect ought to have many qualifications which were not so easily appreciated. The last argument which he would refer to was that the Institute Examination offers sufficient inducement to make the lazy ones work, and that, therefore, the diploma is not essential for that purpose. He held exactly the contrary opinion, and it was this consideration that convinced him more than anything else of the urgency of the measure. He assumed, of course, that the R.I.B.A. would take the leading part in formulating the education scheme as well as in superintending its development, and that the Government action would be as limited as it was in the case of other protective professions.

The Hon. Secretary then read the annual report, in the course of which reference was made to the proposal of the Architectural Association of Ireland, that for the future an examination should be held by the Institute, in general education and professional efficiency, and that the passing of such examination should be made a condition precedent to election. This proposal introduced a radical change in their constitution, and would require the creation of an examining body with considerable machinery for the exercising of its functions. The Council, feeling how much the profession owed to the excellent efforts of the Architectural Association and the educational advantages it offered, had given this question most careful attention. Such a radical change as this proposal suggested would, however, have to obtain the consent of the Royal Institute of British Architects, with which body they were allied, and it was not at all evident that they would permit them independently to hold such qualifying examinations.

Mr. W. K. Parry, in moving the adoption of the report, spoke of the work done by the Council not only during the past year, but during the previous three years. He referred to the fact that the rules and by-laws of the Institute had been altered and revised and brought up to date. As a result of this change there would be periodical changes in the Council and the officers of the Institute, thus ensuring an infusion of new blood into the work.

Mr. J. Rawson Carroll seconded the motion, which was carried unanimously.

On the motion of Mr. A. E. Murray, seconded by Mr. W. M. Mitchell, the treasurer's report was adopted. It stated that the period from 1900 to 1903, inclusive, had been characterised by steadily increasing activity, and consequent expenditure on the part of the Council. It had also, fortunately, produced an increase in the number of the members, with the result that the total income received during the four years had exceeded the total expenditure.

The President then read the scrutineer's report, and declared the following nine members elected as members of Council for the coming year:—Sir Thomas Drew, W. M. Mitchell, W. Kaye Parry, A. E. Murray, C. A. Owen, J. P. Sheridan, Frederick Batchelor, F. G. Hicks, and J. Rawson Carroll.

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting on the 22nd ult., Sir William H. White, K.C.B., President, in the chair, the paper read was "On the Resistance of Plane Surfaces in a Uniform Current of Air," by Mr. T. E. Stanton, D.Sc., Assoc.M.Inst.C.E. The paper dealt with the results of experiments made in the Engineering Department of the National Physical Laboratory on the distribution and intensity of the pressure on thin plates and combinations of plates placed in a uniform current of air, and was intended as the first part of a research on the nature and distribution of the pressure of the wind on structures. By a uniform current of air is meant a current in what is known as "eddying motion" as distinguished from stream-line motion, the mean velocity at any point in the direction of flow being uniform across the current. This condition of motion is considered to be the nearest approximation to that of winds of fairly high intensity. The main object of the present research was to determine, if possible, a general relation between the velocity of the current, the dimensions of the plates, and the resultant pressure, as it was felt that experiments in the open air could not be undertaken with any prospect of success until some general relation of the kind had been established. The results of the experiments show that, under the given experimental conditions, a definite relation of the kind existed and may be stated thus: For similar and similarly situated plates or combinations of plates in a uniform current of air, the intensity of pressure is the same for the same velocity of current and general atmospheric conditions. On the assumption that the motion of the wind approximates to that of a uniform current as defined above, the above relation shows that the distribution and intensity of the pressure of the wind on structures may be studied experimentally by means of models of the structures set up in a current of air produced by means of a fan, as in the present case. In illustration of this, the results of experiments made on models of roofs and lattice girders of simple form were given in the paper. Tabulated results were also given for the cases of parallel plates at varying distances apart, plates inclined at varying angles to the direction of the current, and rectangular plates of varying ratio of length to width.

STAINED GLASS AND DECORATION.

WINDOW, RETFORD.—On the 23rd ult. Viscountess Galway unveiled a memorial window in East Retford Parish Church to the members of the Sherwood Rangers Imperial Yeomanry who fell in South Africa. The stained glass window is the work of Messrs. E. Kemp, and the cost is estimated at about 400*l*. It is placed in the south transept, and contains figures, under canopies, on coloured backgrounds. In the upper tier are St. Michael, St. Alleyn, St. Oswald, St. Hugh, St. Charlemagne, and in the lower tier St. George, Edward the Confessor, St. Cuthbert, St. Martinus, and St. Edmund. In the tracery openings are the arms of the borough and the regimental arms, and on a shield below the window is the inscription.

OBITUARY.

MR. PAIN.—We have to announce the death on December 19, at No. 40, Baron's Court-road, Kensington, in his sixty-seventh year, of Mr. William Pain, of the firm of Messrs. Lee and Pain, of No. 63, Lincoln's-inn-fields, W.C., architects and surveyors. Mr. Pain was elected an Associate of the Royal Institute of British Architects in 1869 and a Fellow in 1875; he was a member of the Architectural Association and a Fellow of the Surveyors' Institution. Mr. Pain was formerly in practice as a member of the firm of Messrs. Lee Brothers and Pain, of No. 63, Lincoln's-inn-fields, from which Mr. Charles Williams Lee retired some five or six years before his death on July 28, 1901. Mr. Pain served as member of the Council of the Royal Architectural Museum and Westminster School of Art, in Tufton-street, S.W.; in June, 1901, he was re-elected auditor, and played a leading part in the recent negotiations for the transfer of the museum buildings and the art collection to the Architectural Association. In conjunction with his partners he was largely employed as a rating surveyor, and in dealing with controversial cases arising out of compensation claims, rights to light and air, and similar matters. He and his firm have been concerned in the development and laying out of several landed properties in the suburbs of London, including estates at Clapham, Holloway, Isleworth, and Putney. Their architectural work comprises many country houses, the building of Her Majesty's Opera House, various improvements at the Haymarket Theatre, St. John's Church, Putney, St. Stephen's Church, Wandsworth, and the Lodge of St. Katharine's Hospital in Regent's Park, several school buildings, etc.

DIARIES.

MESSRS. HUDSON & KEARNS, Southwark-street, S.E., have sent us several of their well-known diaries for 1904. As in previous years, the "Architect's Diary" is issued in two sizes (Nos. 12 and 13), the larger one having two pages to a day, while the smaller has one. In other respects these two are the same; each has an index, and most of that general information which is useful to architects. The information includes a list of cases decided in the superior courts of justice during the legal year from November, 1902, to August, 1903, of interest to the profession, professional practice and charges of architects, a list of metropolitan Surveyors and Districts, with official and private addresses, &c. The "Builder's Diary" (No. 11) gives two days to a page, but the work contains some useful tables, &c., for builders. The "Diary and Note-book" (No. 9) is another form, similar to No. 11, but without the tables and some other special information. All these diaries are admirably printed and arranged and leave little or nothing to be desired.

BOOKS RECEIVED.

PROCEEDINGS OF THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS. Edited by Thomas Cole, A.M.Inst.C.E. Vol. XXIX. 1902-1903. (E. and F. N. Spon.)

A POCKET DICTIONARY OF HYGIENE. By C. T. Kingzett, F.I.C., and D. Homfray, B.Sc. Second Edition. (Baillière, Tindall, and Cox. 2s. 6d.)

COLD GREENHOUSES AND FRAMES (Rural Handbooks Series). By D. S. Fish. Dawbarn and Ward. 6d.)

Correspondence.

DURBAN TOWN HALL COMPETITION.

SIR,—Will you allow me space to state how this important competition is being conducted?

When the conditions were issued, it was stated that, if any competitor in any way canvassed any member of the Council, it would disqualify the architect at once.

A Johannesburg competitor asked the late assessor (who selected the six designs for a second competition) how he had arrived at his decision, and what points were considered in selecting the six designs; the assessor stated that he and a councillor inspected the plans, the councillor selected eight designs, and he selected six out of the eight. (Note: the councillor referred to is not in the architectural profession.)

Upon making inquiries myself of officials at the Durban Town Hall when the competition was likely to be decided, I was told the Council were judging the plans themselves, and that the two Durban architects' plans were in: that the designs from England had not yet arrived, but that one of the Durban architects had taken photographs of his design, and that he would no doubt let me have a sight of these, as he (the official) had seen them, amongst other people.

A local paper stated some little time ago that their representative had seen the designs; the paper gave a rough estimate of the cost, and stated that the design he approved of was a very ne one.

FAIRPLAY.

BRIGHTON AND HOVE HOSPITAL FOR WOMEN COMPETITION.

SIR,—So many competitors have written to me on the subject of Mr. Hine's award (and not one in its favour), that I should be glad of the publicity afforded by your columns to ask those competitors who have not written to send me their names and addresses, that I may communicate with them.

HORACE R. APPELBEE.

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The Student's Column.

ARCHES.—I.

INTRODUCTION.

NO tradition has been handed down to tell us, even in general terms, when and how the principle of the arch first occurred to the human intelligence. Natural and artificial caves have been used in all ages by mankind as dwellings and places of refuge and burial. It is quite conceivable, therefore, that man, who has always been a thinking animal, may have reasoned out an embryonic theory of the arch when reclining at his ease and gazing dreamily at the ceiling of some vaulted chamber fashioned by the forces of Nature.

It is true that in evidences remaining of the earliest burrowings below the surface of the earth there is not much suggestion of the arch, for the idea generally appears to have been to support the superincumbent material by flat stones acting as beams. Examples of such construction are to be found in the Pictish dwellings of Orkney, of which Fig. 1 is a typical representation. Stone beams used in this manner would have a most natural tendency to break across, and it is not unreasonable to suppose that the notion of fixing two stones, as in Fig. 2, was suggested as a simple means of avoiding transverse rupture. This first dream of an arch may have been supplemented by others in which more than two stones were incorporated, as in Fig. 3, and so a more complete type of structure may have been evolved in progress of time, and when men came to build their dwellings on the surface of the earth.

Above the entrance to the Great Pyramid of Ghizeh we have an example, probably dating from 2500-2200 B.C., of an approach towards the arch, and a similar type of construction is to be found in the ceiling of the Third Pyramid.

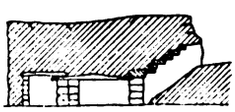

Fig. 1.

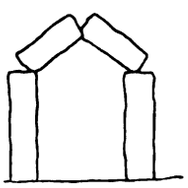

Fig. 2

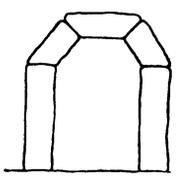

Fig. 3.

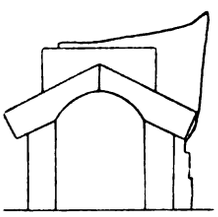

Fig. 4.

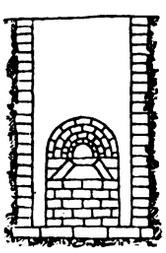

Fig. 5.

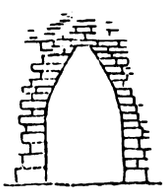

Fig. 6.

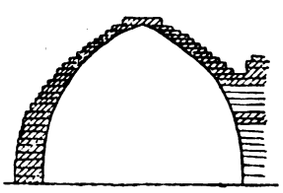

Fig. 7.

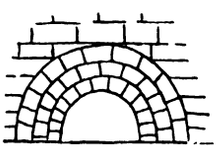

Fig. 8.

The latter is shown in Fig. 4, and it will be seen that the stones are placed practically as indicated by Fig. 2. Further development of the principle is evidenced by arched chambers in the brick-built pyramids at Thebes, which are generally believed to date from about 1200 B.C.

Perhaps the most interesting arched structure among Egyptian antiquities is to be found in "Campbell's Tomb," as it is called, at Ghizeh. This relic consists of an open excavation, in the middle of which are the remains of a masonry tomb. Fig. 5 is a section of the pit with the tomb in elevation. Unhappily, the Egyptian Government, in its unregenerate days, destroyed the upper arch to secure material for the construction of a mill. The tomb is covered first by three stones, which illustrate the second step towards arch construction, as in Fig. 3, and over these strutted stones was formerly a circular masonry arch of fully developed design. From some indications left of a springing, the excavation is believed to have been enclosed by another arch. The excavation measures 30 ft. by 26 ft. 3 in. on plan, and if the supposition is correct this would be the most important stone arch of which any suggestion remains. In addition to the springing stone, there are other reasons for believing the excavation was arched over, and, besides, it is not easy to see in what other way it could have been covered.

Attempts towards the realisation of an arched structure have been made in all parts of the world, by laying masonry in horizontal courses converging to a central point. Examples of such construction are to be found in the ancient monuments of Central America, and the method pursued will be made clear by Fig. 6. This typifies what may be termed an "apparent" arch, and the principles involved are those of the cantilever and the strut. Each stone is held in position by the superimposed weight of the wall above, and the inner facing walls, also held together by vertical pressure, afford a certain amount of mutual support to each other through the central stone.

Other structures of somewhat similar character are to be found in Europe, the most important being the Treasury of Atreus at Mycenæ, of which a section is given in Fig. 7. The building consists of projecting courses of masonry laid horizontally and corbelled so as to give the appearance of a parabolic arch, the lower projecting angles of the stones having been cut off to preserve the lines of the required profile. This work presents clear evidence that its architect had some knowledge of the arch principle, for excavations have shown that the upper rings of masonry were fashioned suitably for the resistance of external pressure. The stones in these are shaped so that the joints are, to some extent, radial, and this arrangement is increased by stone wedges driven into the joints from the outside. The design followed seems to indicate that the principle of the vertical arch was not understood in Greece at the time when the Treasury of Atreus was built. Even at a much later period very little use was made of the arch by the Greeks, and the theory has been generally held that this nation was not acquainted with its principles. This supposition seems somewhat improbable, as the arch was almost certainly employed by other nations with whose architectural works the Greeks were undoubtedly familiar.

We must give credit to the Romans as the first nation of the world to demonstrate the suitability of the arch for spanning openings of considerable width and its great utility in other directions. By its aid the Romans succeeded in doing what their predecessors had never been able to effect. They provided means of communicating between the banks of wide and swiftly-running rivers, carried aqueducts across deep valleys, built sewers, and in other ways made extensive use of a principle that has proved to be of immense service to mankind.

The great sewer, known as the Cloaca Maxima is the earliest Roman arch of which we have any authentic knowledge. This work is generally attributed to the first Tarquinius, who died 578 B.C., but some doubt has been expressed whether the sewer as it now exists is not of more recent date. Fig. 8 is an elevation of the Cloaca Maxima, the arch of which is seen to consist of three concentric rings of masonry.

Numerous stone bridges were built by the Romans, and the remains of some still exist as proofs of the excellent work and ingenuity of the builders. Of these arched structures some are worthy of special notice, and apart from the circular form of the arch, and the equal depth of the stones in the arch ring, they are very like bridges of modern design.

The Pons Milvius, built near Rome about 100 B.C., had arches of 51 ft. to 79 ft. 9 in. span, and a width of 28 ft. 9 in. In the Pons Ælius, built by Hadrian, over the Tiber, the main arch had a span of more than 62 ft., and the width of the bridge is stated at 50 ft. 9 in.

One of the most remarkable works of the kind was the bridge built across the Danube in the reign of Trajan (104 A.D.) by Apollodorus of Damascus. The historian, Dion Cassius, states that this bridge consisted of twenty semi-circular arches supported on masonry piers. The exact dimensions are not perfectly clear, but, according to the account given by Rondelet in "L'Art de Batir," the piers were about 160 ft. high and 64 ft. thick, and the arches were of 181 ft. span. From a bas-relief on the Trajan column at Rome it appears that the arches were of timber. The depth and rapidity of the river must have added considerably to the difficulties attending the execution of this great engineering work, the total length of which was not less than 3,000 ft., and may have been considerably more.

One other noteworthy bridge built in the time of Trajan was that over the Tagus at Alcantara. The total length of this structure is 650 ft., and the bridge comprises six semi-circular arches, two of them having spans of 100 ft. The roadway is level throughout and crosses the river at an elevation of 140 ft. This bridge still exists as a testimony to the wonderful genius of the Roman race, and as a reproach to ephemeral builders of the present day.

The introduction of the arch by the Romans was the beginning of a complete change in the architectural forms imported from Greece. By slow degrees the predominance of horizontal lines became less marked, and finally the bold simplicity of the Romanesque style budded forth into the foliation of the Gothic style. In the articles which are to follow we shall consider the arch from an engineering standpoint, and for this reason it is unnecessary to enter upon details relative to variations of form that are purely architectural in character. Some such forms doubtless exhibit convolutions and other features that are superfluous, or even detrimental if examined by the cold light of science, but they all find appropriate place in artistic building construction. In engineering works, and in buildings too, where strict conformity with mechanical principles is a first essential, the simpler forms of arch are always preferred, as giving the most satisfactory results at the least possible cost for any given class of material. Therefore we shall not attempt to trace the general history of the arch through the Middle Ages, but will confine attention to its development in connection with bridge building from the days of ancient Rome to the present epoch.

After the disruption of the Roman Empire very little advance was made in bridge building for some centuries. An arch of considerable boldness was thrown over the Serchio at Lucca, about 1000 A.D., the span being 120 ft., and the roadway, standing at an elevation of more than 60 ft. above the stream, was only 9 ft. wide Although so slenderly proportioned this arch was of such admirable workmanship and the mortar was of so excellent a quality that on one occasion the arch proved itself capable of withstanding a flood that rose nearly 30 ft. above the springing.

Towards the end of the twelfth century some religious confraternities were formed, the members of which were known as "Frates Pontis," and numerous bridges were built by them during the succeeding centuries, both on the Continent and in this country.

One famous bridge they erected was built in 1178-1188 A.D., over the Rhone at Avignon. Four arches of this work still remain, and are noteworthy for the elliptical form of the arch. Old London bridge, commenced in 1176,

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appears to have been one of the first works of the "Frates Pontis" in England.

An interesting structure attributed to a religious community is the "triangular bridge" at Croyland. This still stands at the confluence of the rivers Welland and Nene, and the Catwater drain, and is an example of the skill attained in arch construction by the monks of the fourteenth century. The bridge consists of three pointed arches with abutments at the angles of an equilateral triangle, and meeting in the middle so as to give three waterways and three roadways.

Striking proof of the boldness displayed by mediæval builders is furnished by records of the bridge formerly spanning the Adda at Trezzo. This fine work was constructed at the instance of Bernabò, Duke of Milan, during the latter part of the fourteenth century. It consisted of a single arch of granite in two courses, the innermost 3 ft. 3 in. thick in the direction of the radius, the outermost 9 in. thick. The arch had a clear span of 251 ft. at low water, and a rise of 88 ft.

At the present time the greatest span of any masonry arch is only 220 ft., a fact which adds to our regret that the Trezzo bridge was destroyed by Carmagnola when, as general of the Venetian army, he was waging war against his old master the Duke of Milan.

A few years later the brick bridge over the Ticino at Pavia was erected under Gian, Duke of Milan, to whom also we owe the brick-built Cathedral of Milan. The bridge at Pavia, which is still in existence, has seven pointed arches, each 70 ft. span and 64 ft. in height, the depth of the arch-ring at the crown being 5 ft. 6 in. The bricks in this case were made of different sizes to suit their positions in the bridge, and were hollowed in the middle for the purpose of reducing weight.

In 1454, the old bridge of Brioude was built over the Allier, in France. According to Rennie the span was 183.73 ft., and the arch was of segmental form with a height of 60 ft., while the bridge was only 16 ft. wide. This structure collapsed in 1822 after having existed for 368 years.

A very fine bridge, the "Ponte della Trinita," erected at Florence in 1566, from the designs of the celebrated architect, Bartolomeo Ammanti, is interesting as showing an approach towards the elliptical arch. The centre arch has a clear span of 96 ft., and the two outer arches are 83 ft. and 86 ft. span respectively.

Turning to our own country we do not find many notable examples of mediæval arch. There is a very fine fourteenth century stone bridge at Warkworth, Northumberland, and another noteworthy structure is Berwick bridge, completed in 1634, the largest arch of which has a clear span of 74 ft. 6 in. Both of these are in excellent preservation, and the last-named still forms the only highway communication between Berwick and Tweedmouth.

Whether any theoretical knowledge of the principles of the arch was possessed by ancient architects we cannot tell, but it is quite certain that they were most successful in the design of arched structures that have lived to put to shame many modern works. Roman architecture of the kind was characterised by great boldness and constructive skill, and we may reasonably conclude that the Romans possessed fully as much knowledge of the true principles of the arch as was evidenced up to the end of the seventeenth century. The materials of construction were the same, and if we disregard purely architectural developments of the arch, it must be conceded that very little advance was made from the time of the Romans to the end of the period mentioned.

PROFESSIONAL AND BUSINESS.—Messrs. A. J. Arrowsmith and Co. have removed from 80, New Bond-street (which has been the address of the firm for 123 years) to 22, Mount-street, Berkeley-square, W.—Mr. John Cash, architect, has removed his office from 28, Newman-street, to 22, Surrey-street, Strand, W.C.—Mr. George O. Scorer, architect, has removed his office from 28, Newman-street, to 22, Surrey-street, Strand, W.C.

EXAMINATIONS IN SANITARY SCIENCE.—Mr. T. J. Moss-Flower, A.M.Inst.C.E., who has long conducted classes for instruction in sanitary science, sends us a useful pamphlet under the above heading, giving the syllabus of subjects for examination adopted by the Sanitary Institute, the Surveyors' Institution, and other similar bodies, together with a prospectus of his own very extensive course by tuition in practical and sanitary subjects.

GENERAL BUILDING NEWS.

RESTORATION OF ROGIET CHURCH, MONMOUTHSHIRE.—The reopening of Rogiet Parish Church after restoration and enlargement took place recently. The old plastered roof has been removed in its entirety. A gallery which blocked the west arch window has been taken down, and the arch opened out and the tower floor provided with seats. The tower itself has been reroofed and repointed, and the pinnacles, only one of which remains—and that in a mutilated condition—have been restored; the lateral octagonal tower over the belfry stairs has been recapped, and the chancel has been strengthened by a new buttress on the south side. The new north aisle forms one of the important items of the enlargement. Its pillars have carved emblems on the capitals, and the arcading is carried out in symmetrical proportions with the rest of the edifice. The new vestry on the north side is entered from the north aisle, and a new carved oak pulpit, on stone base, has been provided, the central panel of which contains a figure of the Virgin Mary, to whom the church is dedicated. The church is small (its seating capacity being under 100), but there are several very interesting features in and about it. There is the arched entrance to the old rood loft; a number of old mural paintings over the chancel arch, fragments of which are a lion's leg and paw, and a unicorn's leg and foot, and these have been left within a bevelled square; a small square niche, probably a tabernacle, which has now been fitted with an oak door with ornamental iron hinges; the old font, of very early Norman; the original stone altar slab, found buried in the nave, with the consecration crosses still visible, which has been restored to its former position and now rests on a strong oak table support; and the old confessional window, used under special licence by travelling friars in pre-Reformation days. These windows were built up at the time of the Reformation, but this one has now been restored. The fittings include an altar cloth and frontal, worked by Messrs. Ponting, of Kensington, brass altar cross and altar desk, a 6-cwt. bell, which has been rehung by Messrs. Carr, of Birmingham. The wall on the north side, almost touching the church, has been taken down and replaced by iron ornamental railings, with a private entrance to the vestry, surmounted by iron arch and lamp. The architects were Messrs. Seddon and Carter, and the work has been carried out by Mr. W. Clarke, Llandaff, Mr. Richards being the foreman of the works.—*Western Mail.*

BUILDING IN MANCHESTER.—Whilst the building trade has not displayed any extraordinary vitality during the past year, the larger firms have found things moderately brisk. Compared with the previous year, however, the condition of trade has been nothing like so good. A few large buildings in the city have been completed within the past few months, notably the Midland Hotel and Parr's Bank, and the firms engaged thereon have been moderately busy. If the present growth of new buildings continues there will not be much room for complaint. In the suburbs there has been a large increase in cottage property, whilst within two or three miles of the centre of the town much land has been covered with houses of a low rental. In the districts of Rusholme, Fallowfield, and Longsight houses have been increased by the hundred. In some respects this is not an unmixed blessing, for in many cases old mansions have been demolished, and the grounds surrounding them, which were looked upon as breathing spaces for a somewhat congested city, have disappeared. This is particularly noticeable in the Rusholme district, where small blocks of property have been erected. At Fallowfield, on the Firs Estate, and on the Mabfield Estate, small houses, to let at rentals ranging from 9s. to 12s., have been extensively built—and, whilst such houses are not altogether satisfactory, they are far above the average in matters of design and general convenience, although the rooms are in many cases smaller than the Corporation are warranted in allowing. At Longsight, on the Crowcroft Estate, hundreds of houses have been erected or are in course of erection. A matter of a mile or so from town matters little now that the electric cars cover the distance in such a short time. Higher Broughton, too, has not been free from the builders' visitation, land which within a comparatively recent period was vacant being now covered with bricks and mortar. Labour has been plentiful and cheap, but the practice of erecting houses for speculating purposes is one that cannot be commended. There is one practice in the building trade, extensively followed, which should not be tolerated. We refer to the purchase by wholesale erectors of old building materials and their incorporation in the fabric of newer premises.—*Manchester Courier.*

ST. JOHN'S PARISH HALL, KINGSTON.—The Bishop of Southwark dedicated recently the new parish hall in the parish of St. John's, erected at a cost of 1,300*l.* in Grove-road. This room is the first and principal part of the whole scheme, and there still remain an anteroom, &c., to be erected. The hall is about 100 yards away from the church and vicarage. It has been built from the designs of Mr. A. J. Style (Thames Ditton). The contractors were Messrs. Johnson and Co., Ltd., of Wandsworth. The hall has been constructed of red and yellow bricks. The new hall is 57 ft. long and 26 ft. wide, and is capable of accommodating some 300 people. At one end there is a recess 10 ft. deep, in which a stage has been erected.

DUNDEE BUILDING TRADE IN 1903.—When commenting on the state of the building trade for the year 1902, it was indicated that the outlook for 1903 was far from promising. That forecast has, unfortunately, been entirely verified. It is easy to exaggerate depressions of trade, but the facts at present point to a serious state of matters. The unanimous verdict of those immediately interested in the trade is that it has never been so bad for many years. The slackness of the general trade of the city naturally prevented the Corporation launching into new schemes of improvement. Work on hand was, of course, carried on, and much of it completed during the past twelve months; the streets were renewed where necessary, but little work of any magnitude was started. Private work has also been scarce, while public bodies have had to husband their resources as far as possible owing to the lack of money in the city.—*Dundee Advertiser.*

BUILDING TRADE IN LEEDS.—A year ago the building trade was suffering from acute depression, the preceding year being described as one of the worst in the history of the trade, and it was recognised at that time that a continuance of that deplorable state of affairs must be looked for. At the end of another year there is a similar tale to unfold—with this difference, that conditions now are, if anything, even worse than was the case twelve months ago. And, what is more, the future does not hold out any hopeful prospects of an improvement. One would naturally have thought that after a protracted period of depression, such as has been experienced of recent years, trade would have begun to revive. And in the ordinary course of events this would have been so. But the present unrest in the political and commercial worlds has tended to prolong bad trade, and especially in the case of speculative building the outlook is very black indeed. Builders, in view of this disquietude, are strongly disinclined to speculate to any great extent, and it is felt that until the great questions now before the nation are finally settled there can be but little hope of the building trade recovering to any appreciable extent from the present stagnation. Many men are out of employment in all branches of the trade, and whereas a year ago large numbers of workmen left the district for London and other parts of the kingdom, the slackness of trade this year is so general that little, if any, advantage can be reaped by leaving Leeds for any part of the country. In fact, great as the depression is in Leeds, it is very doubtful if the state of trade in other places is so good as it is in this neighbourhood. Of course, apart from the political question, there are minor reasons for the present depression in the building trade locally. Perhaps the chief of these is to be found in the fact that in recent years building has been going on too rapidly—especially speculative building in the suburbs.—*Yorkshire Observer.*

PUBLIC HALLS, GLASGOW.—On the 24th ult. Langside Public Halls, Glasgow, were opened. It has been sought to reproduce in design, so far as possible, the old National Bank buildings in Queen-street, and the materials of the old bank have been utilised in the erection. The Queen-street building was designed by the late Mr John Gibson. It was Italian in style, having a front divided into five bays, with double orders—Ionic below and Corinthian above—the centre bay slightly projecting, and having coupled columns right and left. In the reconstructed building the interior is divided into a large hall, with gallery, affording accommodation for 800; a lesser hall, with gallery, accommodating 320; an outer hall, accommodating 100; reception room, accommodating 60, and smaller rooms. The contractors for the reconstruction were Messrs. P. and W. Anderson.—*Scotsman.*

BUILDING TRADE IN EDINBURGH.—During the past year there has been a considerable increase in the value of the work passed through the Dean of Guild Court as compared with the previous year, notwithstanding that the building industry has not shown much increased activity. The reason is in a great measure due to the fact that several of the large public buildings recently passed, involving large monetary value, have not got sufficiently under way to create any noticeable stir. Since the

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completion of the large fever hospital at Colinton Mains, which was opened by the King in the summer, a number of men have been thrown on the list of the unemployed. In the early spring it is expected that a marked change will take place for the better, and that both skilled artisans and the labouring classes will find work to do. The number of warrants granted during the year reached a total of 785, and embraced 96 tenements, 52 villas, 97 self-contained houses, 115 public and other buildings, and 530 alterations. In the above tenements there were 25 shops, 48 houses of one apartment, 207 of two apartments, 396 of three apartments, 189 of four apartments, 54 of five apartments, 2 of six apartments, and one of seven apartments, representing a total number of 897 tenement houses, the whole work representing an approximate value of 825,584*l.*

GORDON BOYS' HOME, NOTTINGHAM.—This building is being erected in Cranmer-street, Nottingham. Four stories in height, the building is approached by a main entrance, attained by an ascent of ten steps from the street level. This gives direct communication with the committee-room, waiting-room, office, and sitting-room, which are also approached from the basement by two main staircases. In the basement is a recreation-room measuring nearly 36 ft. by 32 ft., and immediately above this is located the dining-hall, which has a measurement of 40 ft. by 20 ft. At the rear of the building an iron staircase has been constructed. Mr. E. R. Sutton is the architect, and the contractor Mr. F. Messom.

BUILDING IN SHEFFIELD.—Notwithstanding the general decline in trade throughout the year, house building has been as brisk as during 1902. During the twelve months ended December 31, 1902, the houses built and certified for habitation numbered 1,977, and up to December 23, 1903, the number had reached 1,934, so that when the full year's returns are completed there will be little, if any, difference between the two years. The public buildings which have been completed or commenced during 1903 include the new University College Buildings, in Western Bank; extensive additions to the Technical School; St. Silas' Mission Room, Hanover-street; Birch Hall, Trippett-lane; additions to the Children's Hospital, Western Bank; Roman Catholic Presbytery, Norfolk-street; York City and County Bank, High-street; National Provincial Bank, Fargate; Sheffield Education Committee's School of Cookery, Townhead-street; branch bank for the Sheffield Banking Company, at the corner of Infirmary-road and St. Philip's-road; extensive additions to the Sheffield Club, in Norfolk-street, all in the Central District; Congregational Chapel in Owler Greave-road; Mission Room for Friends' Adult School, in Leeds-road; new Wesleyan Reform Chapel, in Woodburn-road; Council School, in Tinsley Park-road; and two lots of Children's Homes, in City-road, in the Eastern District; All Saints' Mission Room, at the corner of Cossey-street and Forncett-street; Administrative Block, boiler-house, and laundry, at Fir Vale Workhouse, in the North-Eastern District; Vestry Offices, in Meersbrook Bank-road, in the Southern District; Wesleyan Reform Chapel, Sharrow Vale-road; Wesleyan Church and Schools, at the corner of Eccleshall and Neill-roads; Council Schools, in Greystones-road; Hollis' Almshouses, at Whirlow Bridge; Infirm Block, in Lyndhurst-road, for Eccleshall Union; and Mortuary, in Osborne-road, and Relieving Officer's quarters in Union-road, for the same authority, in the South-Western District; Council Schools, in Fulwood-road, near Nether Green; Cottage Homes, in Bole Hill-lane, for the Eccleshall Union; Council Schools, in Western-road, in the Western District; and Council Schools, at the junction of Meredith-road and Dykes-lane, at Hillsborough; additions to Parkside-road Council Schools, at Hillsborough; a new Roman Catholic School, in Ripley-street; a branch bank, at the corner of Infirmary-road and Albert-terrace-road, for the Sheffield and Hallamshire Company; and a power station for the Corporation Electric Light Department, in Club Mill-lane, in the North-Western District.—*Sheffield Telegraph.*

ELECTRIC LIGHT, LEICESTER.—On the 22nd ult. a Local Government Board inquiry was held at the Town Hall, Leicester, into an application of the Town Council to borrow 100,000*l.* for electric lighting purposes and 22,108*l.* for the building of a new elementary school. Some figures were given showing the growth of the electric light undertaking, in which a total sum of 173,982*l.* was already invested. The demand for current steadily increased, and in order to keep pace with that demand the Corporation had had to spend another 30,777*l.*, which sum was included in the present application. The engineer (Mr. Colson) stated that the increased demand for current had been phenomenal. It was not proposed to light the public streets with electricity. The application was not opposed.

MISCELLANEOUS.

INTERNATIONAL SOCIETY OF SCULPTORS, PAINTERS, AND GRAVERS.—We have received the following communication from the secretary of this Society: "Fears have been expressed that by abolishing the private view the International Society of Sculptors, Painters, and Gravers may drive collectors and amateurs from the New Gallery on the opening of their exhibition in January. So far, however, is this from the intention of the council of the Society, that they have arranged for a number of ladies and gentlemen, interested in the Society and its work to visit the gallery on Saturday, January 9, Varnishing Day, and they have therefore inaugurated, or rather revived, the Varnishing Day of the past, at which artists and patrons met in the galleries."

HOUSING. KINGSTOWN, DUBLIN.—Mr. P. C. Cowan, L.G.B. Inspector, held an inquiry on the 21st. ult., on behalf of the Local Government Board, arising out of an application on the part of the Kingstown Urban District Council for sanction to a loan of 64,708*l.* for the purpose of carrying out schemes under parts I. and III. of the Housing of the Working Classes Act, 1890. Mr. J. Berry, Township Surveyor, and others having given evidence, the Inspector said they would have to get fresh plans and specifications for every part of the work, and submit the quantities, estimates, and tenders for all contracts. Only on those conditions would he recommend his Board to sanction the loan.

MANCHESTER ART GALLERY EXTENSION.—There was a meeting of the Art Gallery Committee in Manchester Town Hall on the 21st ult., when the proposal of the Special Committee on the desirableness of extending the Art Gallery on its site in Mosley-street was considered. A few days ago the Special Committee came to the conclusion that it would be better to proceed with plans for enlarging the Gallery on the existing site rather than wait in the hope that suitable provision would be afforded for art gallery purposes on the land in Piccadilly when the Royal Infirmary buildings have been removed. The Committee a long time ago secured some land behind the gallery in Mosley-street, but refrained from making use of it, in deference to the general wish of their colleagues in the City Council, while the negotiations for the purchase of the Infirmary site were in progress. It was then suggested that an art gallery and a free reference library, in every way worthy of the city, might be built where the Infirmary now stands. The Art Gallery Committee are not unmindful of the advantages that would come to them and to the citizens generally by the realisation of such a plan, but they feel that it is time some definite arrangement was made, and that they should know when they may expect to be in the proposed new home and what space they will have there. Doubtless in the course of the next few weeks they will receive some enlightenment on the subject—probably at the January or February meeting of the Council. The Committee decided to defer discussion of the proposals to another meeting.—*Manchester Guardian.*

BUILDING MATERIALS FOR EGYPT.—The Council of the British Chamber of Commerce in Egypt, in their latest printed report, make the following observations respecting the opening for building materials: "Taking into consideration the enormous amount of building construction at present being undertaken in Egypt, not only by private persons, but for Government purposes, our attention has been drawn to the small part played by British manufacturers in supplying the materials employed, and to the direction in which this state of things may be amended. At the root of the defect appear to be the characteristic unwillingness of the British makers to enter the market and to cater for the needs of the country, the absence of direct representation, and the high price of British goods. It cannot be too often nor too strongly impressed on the manufacturer that the preponderant demand in Egypt is for cheap articles. They may be inferior, but they must be cheap. To take steel joists as an example, Belgium and Germany enjoy the practical monopoly of the trade, and can undersell Great Britain by as much as 2*l.* to 3*l.* a ton. The former countries supply an article which suffices for all practical purposes and passes all the necessary tests, and yet is inferior in quality to English steel; it will not stand rolling into small sections and thin plates, which are consequently supplied by England. There appears to be no reason why our country should not be able to take a share in the trade by manufacturing a lower grade, but serviceable, quality. In lead and iron piping, in sanitary goods, in paints and oils, in ironmongery for doors and windows, it is the same story—Great Britain will not condescend to cheapness. For a given diameter the foreign maker will offer lead piping that is thinner in section, and, consequently, lower in price, than the English one, and yet will satisfy the tests prescribed. The well-known patterns of Doulton, Jennings, and Shanks in sanitary appliances are universally imitated in lower qualities. Paints and oils of English manufacture are better represented than they used to be, but their high price still rules them out of the market for building purposes. Lifts are supplied almost entirely from Italy, English manufactures in this department being absolutely unknown. In fact, the only line in which Great Britain is adequately represented is that of building machinery and implements. It is a feature in Government work for bridges, etc., put up for tender, that the contractor is invited to submit his own plans. This is, no doubt, an economy for the Government, but it directly encourages the drawing of plans adapted to the inferior material. Such, however, being the conditions, it behoves the British manufacturer to fall in with them if he is to enter the field with his competitors on anything like equal terms."

KING'S COLLEGE HOSPITAL.—The President and Governors will apply for powers in the course of next session to dispose of the hospital buildings and site in the vicinity of Clare-market; a joint committee of the hospital and college authorities make an appeal for a sum of 300,000*l.* to enable them to build and equip a new hospital and chapel upon a site of 12½ acres, known as "The Sanders Estate," at the foot of Denmark-hill, close to Camberwell-green. The hospital was first established in the old workhouse of St. Clement Danes in 1839, in association with the medical school of King's College. The present buildings, which accommodate 220 beds, were begun, in pursuance of an Act of 1851, in June, 1852, from Thomas Bellamy's plans and designs. They stand upon a cleared area of about 1 acre, and, with the fore-court, occupy the sites of St. Clement Danes workhouse and the parish burial ground, commonly called The Green or Upper Ground. The hospital gates (west) mark the site of the Watch House, next to which stood, until their demolition in 1885-6, two quaint old gabled houses and a bulk-shop (the last of its kind in that quarter of the town), near the entrance into Gilbert-passage, Clare-market. Plans of the building are illustrated in M. Armand Husson's "Étude sur les Hôpitaux," a large quarto volume published in Paris in 1862.

WOODEN WATER PIPES.—It is reported from Mexico that application has been made, under the Law of December 14, 1898, for permission to establish in the Republic, as a new industry, the manufacture of wooden tubing for bringing water in large quantities and from a distance in cases where the cost of conveying the water in any other form would constitute an obstacle to the erection of hydraulic works.

DUNDEE INSTITUTE OF ARCHITECTURE.—In reference to a recent advertisement in the local papers, inviting architects to tender for the erection of various public-houses in Dundee, the Institute, at a special meeting, held on the 18th ult., passed the following resolution, which has been sent to all its members:—"This meeting of architects considers that it is inconsistent with the dignity of the profession to tender for the work as advertised by the Dundee Wine, Spirit, and Beer Trade Protection Association, and recommends that architects should refrain from tendering."

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

27,833 of 1902.—F. T. SANDERS: *Spring Hinges and Hasps.*

Hinges and hasps comprising in combination an enlargement at one end of the boring of the hinge rolls, a hole through the wall of the inner roll, and a hole at the lower end of said enlargement of the boring, a nick in each of the hinge plates extending from said holes in the hinge rolls, a coil spring around the hinge rivet and straight ends of said coil spring passing through the holes in the hinge roll into the nicks in the hinge plates.

28,391 of 1902.—G. B. BOWELL: *Automatic Fire Alarm Systems.*

In a thermostatic fire alarm system, in which several installations are connected by a single circuit to a central station, and each installation is protected by open-circuit thermostats, the arrangement of the circuits whereby each installation is a shunt to a portion of the main circuit, and whereby, on severing of the installation circuit, distinctive signals are given at the central station, the system remaining operative until the fire alarm is given.

23 of 1903.—A. SUMMERS and M. SUMMERS: *Ventilators.*

A ventilator, consisting of brackets, having the ledges and inturned edge, forming a receptacle for the plates, said brackets being swivelled to

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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a frame and possessing, at one side of the ventilator, arms coupled to the plate, by which they may be turned on their pivots, said brackets being formed and arranged to rest against one another when the ventilator is closed.

438 of 1903.—O. STEUER: *Alarm Apparatus for Detecting Unauthorised Attempts to Open Doors, Windows, Boxes, Safes, Locks, and the like.*

A device for detecting unauthorised attempts to open doors, windows, boxes, safes, locks, and the like, said device comprising two electric circuit closing springs disposed on an insulating block or carrier, adapted to be secured reversibly to the door lock, window, or other object, said springs being adapted to be electrically connected with an alarm of any suitable kind, in combination with a movable pin or stem, carrying a presser plate or member, and adapted to produce contact of the springs when operated, the arrangement being such that when the said pin or stem is pushed it produces a temporary or a continuous contact of the springs, and closes the circuit temporarily or continuously through the alarm, according to the position of the springs.

1935 of 1903.—A. TAYLOR and N. BROOKE: *Brick Moulding Machines.*

A brick moulding machine, consisting of a steam or the like cylinder, actuating a piston or plunger, and a further cylinder, mounted on a suitable framework, said cylinder having outlets, midfeather, and reducing nozzles, to which are attached smoothing or finishing nozzles or moulds.

1947 of 1903.—R. RAVELLI: *Means for Uniting Parts of Articles of Furniture and the like.*

In means for uniting parts of articles of furniture, in combination, a bolt, a nut, and a sleeve, the sleeve being adapted to locate the nut or the bolt head, so as to prevent it from rotation, and to allow of the bolt being passed through it, and to be inserted and secured endways into one part of the construction so as to abut against the other part, and cause the parts of the construction to be held together upon the bolt or nut being screwed up.

2085 of 1903.—C. H. HEATHCOTE, C. A. HEATHCOTE, and E. G. HEATHCOTE: *Buildings for Storing Cotton and other Baled Goods.*

A building for storing cotton and other baled goods, said building being constructed with walls and a bottom of fireproof and waterproof, or substantially fireproof and waterproof material, and being divided by partitions of similar material into separate compartments, in combination with an overhead crane or cranes, traveller or travellers, adapted to lower and raise the baled goods into and from said compartments, and adapted to take or deliver the bales from or to a point beyond the side of the building, and with water mains discharging into each of said compartments, at or towards the top and bottom thereof, and means for controlling the admission of water to said compartments.

2130 of 1903.—J. REID: *Windows.*

This invention relates to ordinary sash and case windows, and it has for its object to provide simple and improved means whereby the sash can be turned inwards for cleaning purposes. For the lower sash, the window frame is made with a channel at each side, in which the sash slides, and these channels only extend up half the height of the sash when the latter is closed down. In the centre of each channel is a feather, which extends up to the height of the top of the sash when the latter is closed. The sash is likewise provided at each side with a channel, which extends from the top of the sash down to a point at or near the centre, and in each channel is a feather, which extends the full length of the sash. At each side of the window the two feathers—that is, the feather on the sash and the feather on the frame, work against each other when the sash is being raised or lowered, and, when the sash is lowered, the ends of the channels on the sash and the frame abut against one another and form a continuous channel, extending the full length of the sash, thereby keeping out rain, etc. When it is desired to turn the sash in order to clean it, it is first raised up until the feathers on it clear the channels on the frame, when it can be turned over on the pivots and cleaned. The upper sash is made and fitted in the same manner.

2711 of 1903.—F. J. BARKER and J. JOHNSON: *Window Sash Fasteners.*

This relates to that class of sash window fasteners wherein a horizontal lever, pivoted to a plate screwed to the bottom rail of the top sash, can be turned at right angles across the line of junction of the two sashes, under a horizontal catch fixed to, or formed with, a plate screwed, or otherwise securely fixed, to the top rail of the bottom sash, so as to prevent the top sash from being lowered or the bottom sash from being raised, until the said lever has been turned on its pivot out of the way of the bottom sash and in a line with the bottom rail of the top sash.

2738 of 1903.—D. WILLIAMS: *Chimney Pieces.*

The object of this invention is to provide means for fixing chimney jambs to the flanged slips in such a manner that the parts can readily be put together. In bolting or screwing the chimney jambs to the flanged slips the jambs are formed with two or more bolts fixed thereto, at suitable distances apart, the said bolts being of a length to engage with cross strips of slate, wood, or iron, the ends of which bear against the inside of the flanged slips, and are tightened thereto by nuts on the bolts; at the same time the jambs are brought against and clamped tight to the front of the flanged slips. The jambs are formed preferably with the thickened parts or projections where the bolts are fixed. The flanged slips are preferably "L" shape, but a straight piece of slate may instead be provided with projections or pieces fixed thereto for the strips to take against. The strips may be screwed or pegged at each end to the flanged slips, to prevent twisting or getting out of truth. The flanged slips are also formed out of one piece of slate of a suitable size by sawing half through the thickness at opposite sides at a suitable distance from the ends, and splitting the slate between the cuts and in a line with the bottom of the same, thus forming two flanged slips of "L" shape as desired.

3305 of 1903.—C. PHILIPPI and H. MAURER: *Automatic Rising Hinges.*

An automatic rising hinge, with continuous lubrication, having a spindle provided with helical-end surfaces, rotarily arranged on a helical bearing surface, the latter serving as a lubricant receptacle in the lower hinge socket by cutting away the spindle or socket.

3443 of 1903.—J. E. PHILLIPS: *Means for Securing and Protecting Windows and the like.*

This invention relates to means for securing windows or entrances to private or other houses in order that they may be protected against burglary. According to this invention, a collapsing set of strong bars of circular form is fitted inside the window, each bar being held at its ends in a slotted plate, in which it can turn freely and travel from end to end. Each slotted plate is connected to the bar immediately below it, and the plates are arranged to collapse one inside the other, so that, when dropped, the bars can collapse into a case fitted to receive them, and secured inside the window at the bottom, so that the apparatus is completely concealed. Cords or other connections fastened over pulleys serve to raise the bars, which, when extended across the window at equal distance, form a screen. On releasing the cord the bars drop into the case.

23,628 of 1903.—H. FOX: *Latches and Combined Locks and Latches for Doors.*

A door latch or combined lock and latch, having the latch bolt head made separate from the lath part of the latch, the end portions of the latch bolt head and of the lath being formed so as to engage together with the latch bolt projecting as a right-hand or as a left-hand latch, in combination with a movable filling-up piece, which, from the outside of the latch case, or combined lock and latch case, can be moved so as either to keep the latch bolt head and lath engaging together or allow of them being disconnected and the bolt head removed and replaced and reconnected to the lath without removing the cover plate from the latch case or combined lock and latch case.

18,736 of 1903.—T. B. JOSEPH: *Cement.*

This invention consists in dissolving arsenic acid in water at about the proportion of 30 lb. to the ton. Stucco or powdered calcined sulphate of calcium is next stirred therein until the same becomes a thick flowing mortar, which can be run from the mortar box into moulds to set. The arsenic acid combines with the calcium sulphate and makes the calcium insoluble. When then the cement has been air dried, the same is soaked in a solution of water containing about 6 lb. of peroxide of barium to the ton of water. The peroxide of barium forms barium sulphate with the sulphur of the calcined sulphate of calcium. The cement is again air dried and then soaked in a solution of water and chloride of ammonia of about 1½ lb. to the ton of water, which operation gives the cement more resistance against heat, and at the same time makes it harder. The cement is again air dried and again soaked in heavy refined petroleum oil, preferably paraffin. The cement should be allowed to soak some time in this oil, after which it is taken out and allowed to dry, as the last operation has the effect of making the cement more impervious to water.

23,466 of 1903.—E. R. PALMER: *Flushing of Water Closets.*

A water closet wherein the flushing pipe, or branches thereof, leads directly to the front of the flushing rim, in lieu of to the rear thereof, whereby the water enters at full pressure within the front of such rim.

23,465 of 1903.—E. R. PALMER: *Flushing Arrangements of Latrine Systems.*

A system of flushing closets, urinals, and the like, wherein the discharge pipe of the flushing tank leads to a "hydraulic flushing main," from which ascending flushing pipes lead to the flushing inlets or flushing points of the closets or urinals, whereby, said hydraulic flushing main being always filled with water, the flushing of all the closets or urinals simultaneously and with equal force is ensured.

23,947 of 1903.—W. GLOSSOP: *Construction of Stones for Use in Railway Platforms, Landing Stages, Docks, Quays, Steps, Landings, and the like.*

This invention relates to the construction of stones for use in railway platforms, landing stages, docks, quays, steps, landings, and the like, the object being to clearly distinguish and define in a permanent manner the edge or limit of such platforms, stages, docks, quays, steps, landings, or the like, thereby facilitating the location of the outer edge or edges during dark or foggy weather, and thus preventing accidents. Hitherto the edges of such platforms, landing stages, docks, quays, and the like have commonly been whitewashed or painted white, but this is soon washed or worn off, becoming indistinct, and, therefore, ineffective and unsatisfactory. To obviate this the stones or slabs used for the above-mentioned purposes are constructed with a permanent white edge or border. This edge or border may be formed of any suitable white granulated material, such as white spar or the like, and it may be moulded in with the body of the slab, which is preferably of artificial stone. Or a suitable slab of artificial stone may be inlaid with any suitable white stone or material, either natural or artificial, or white stone edges may be let into or fixed in any suitable manner to the natural stone commonly used for the above-mentioned purposes; or stone of any other distinctive colour may be used for the purpose of this invention, in combination with either the natural or the artificial stone, or with white edges or strips. In all cases the aforesaid white edge or border may, if desired, be checked, grooved, or roughened in any suitable manner, so as to afford a secure foothold or grip.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 4.—By J. CARTER, JONAS, & SONS (at Cambridge).

Cambridge.—32 and 33, Market-hill, and 16, 17, and 18, St. Edward's-passage, business premises; also the "Central Temperance Hotel and Coffee Tavern," area 6,600 ft., f., y.r. 305*l.* £8,000

December 18.—By G. LOVEITT & SONS (at Coventry).

Coventry, Warwick.—18, High-st. (S), f., y.r. 55*l.* 1,210

87, Foleshill-rd., u.t. 84¼ yrs., g.r. 1*l.* 7s. 9d., w.r. 16*l.* 18s. 205

Meridan, Warwick.—A freehold house, shop, and two cottage tenements, area 970 yds., p. .. 400

A freehold house, area 1,337 yds., y.r. 14*l.* 500

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

SATURDAY, JANUARY 2.

Incorporated British Institute of Certified Carpenters (Carpenters' Hall, London Wall, E.C.).—Monthly meeting. (1) Election of secretary. (2) To decide upon the fee for life membership, and the design of seal to be adopted for the Institute certificate. 6 p.m.

MONDAY, JANUARY 4.

Royal Institute of British Architects.—Fifth General Meeting (business, for members only (*a*) to proceed with the election of candidates for membership under By-laws 7, 8, and 9. (*b*) Messrs. G. A. T. Middleton, Butler Wilson, President of the Leeds and Yorkshire Architectural Society, J. W. Beaumont, President of the Manchester Society of Architects, John Woolfall, President of the Liverpool Architectural Society, Edgar G. C. Down, on behalf of the Cardiff, South Wales, and Monmouthshire Architects' Society, and Herbert Davis, on behalf of the York Architectural Society, have given notice that they will bring forward the following motions:—(1) That this Institute is in favour of the general principle of the compulsory examination and registration of architects. (2) That a Committee be appointed to consider what steps should be taken to give effect to this principle, and to report thereon to a Special General Meeting before the opening of Parliament. (3) To nominate this Committee. 8 p.m.

Liverpool Architectural Society.—Mr. E. Guy Dawber on "Country Houses," illustrated by lantern slides. 6 p.m.

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
District Baths, Leeds-road	Bradford Corporation	F. E. P. Edwards, City Arch., Whitaker Bdgs., Brewery-st., Br'd	Jan. 4
Alterations to Cottage Baths, Low Moor	do.	do.	do.
Sewerage Works	Wicklow Urban Council	J. Pansing, Town Surveyor, Church Hill, Wicklow	do.
Chancel, &c., St. John's Church, Wakefield	.....	C. W. Richardson, 62, Westgate, Wakefield	do.
Cemetery Chapel and Gateway	Queensbury U.D.C.	T., H., and F. Healey, Architects, Bradford	Jan. 5
Sewers, &c., and Boundary Walls, &c.	do.	J. Drake & Son, Queensbury, near Bradford	do.
Infectious Diseases Hospital, Hoyland Moor	Penistone Hospital Committee	G. A. Wilde, Architect, 9, Bank-street, Sheffield	do.
Fittings & Furniture, New Library, Lower Kelvin-st.	Dublin Corporation	H. Campbell, City Hall, Dublin	do.
Enclosing New Cemetery, Abbeyleix	District Council	G. Finnegan, Clerk to Council, Workhouse, Abbeylix	do.
Scavenging and Team Work (Four Districts)	Mountain Ash U.D.C.	W. G. Thomas, Surveyor, Town Hall, Mountain Ash	do.
Urinal and Latrines	Wallsend Corporation	G. Hollings, Hugh-street, Wallsend	do.
Ironrailing City Hospital, Colinton Mains	Edinburgh Corporation	R. Morham, City Architect, Public Works Office, Edinburgh	do.
Private Street Works	Leeds Corporation	City Engineer's Office, Municipal Buildings, Leeds	do.
Bath Annexes, City Hospital, Leeds-road	Bradford Corporation	F. E. P. Edwards, City Arch., Whitaker Bdgs., Brewery-st. Br'd.	do.
Warehouse, Burnett-street, Bradford	.....	Milnes & France, Architects, 99, Swan-arcade, Bradford	Jan. 6
Taking down and Re-building Wall, &c.	Wardle U.D.C.	T. Burrows, Surveyor, Wardle, Lancs.	do.
Paving, &c., Blenheim-avenue, &c.	Leeds Corporation	City Engineer's Office, Municipal Buildings, Leeds	do.
Macadamising, &c., Avenue Crescent	do.	do.	do.
Water Supply at Hospital Buildings, Craiglockhart	Edinburgh Parish Council	A. Ferrier, Parish Council Chambers, Edinburgh	Jan. 7
Steam Heating ,, ,, ,,	do.	do.	do.
Drainage ,, ,, ,,	do.	do.	do.
300 Yards Cube of Surface Flints, Melcombe Regis	Weymouth Town Council	R. N. Howard, Town Clerk, Weymouth	do.
Water Sup., Heat. & Drain. Craiglockhart Poorhouse	Edinburgh Parish Council	A. Ferrier, Parish Council Chambers, Edinburgh	do.
Villa Residence and Stables, Crescent-road, Llandilo	Mountain Ash U.D.C.	A. S. Williams, Architect, Llandilo	Jan. 8
Accom. for Nurses at South-Eastern Ambulance Stn.	Metropolitan Asylums Board	T. W. Aldwinkle & Son, 20, Denman-st., London Bridge, S.E.	Jan. 9
10-ton Weighbridge at Refuse Destructor Works	East Ham U.D.C.	A. H. Campbell, Engineer, Town Hall, East Ham	do.
Repairs, &c., Columbkille Church, co. Longford	.....	J. G. Skipton, C.E. Vicarage, Gowna, co. Cavan	do.
Mild Steel Angle Racks, Port Dundas Electric. Wks.	Glasgow Corporation	W. A. Chamen, Engineer, 75, Waterloo-street, Glasgow	Jan. 11
Drainage Works at Granton (Section 2)	Edinburgh & Leath Gas Commis.	W. R. Herring, M. Inst. C.E., New-street Works, Edinburgh	do.
Alterations to Police Station, Bury St. Edmunds	West Suffolk Standing Joint Com.	A. A. Hunt, County Arch., 51, Abbeygate-st., Bury St. Edmunds	do.
Cottage, Dungannon Junction	G.N.R. Co., Ireland	W. H. Mills, Engineer, Amiens-street Terminus, Dublin	do.
New Stabling, Wkshops, Additions, &c., to Fire Stn.	Barnes U.D.C.	Council's Engineer, High-street, Mortlake	Jan. 12
Ashold and Cole Valley Works (Contract 47)	B'ham, Tame, and Rea D.D. Board	J. D. Watson, Engineer to Board, Tyburn, Burnham	do.
Workhouse Extension, Harrow-road	Paddington Guardians	F. J. Smith, F.R.I.B.A., Parliament-mansions, Victoria-st., S.W.	do.
Stabling, Workshops, &c., 1, High-street, Mortlake	Barnes U.D.C.	G. Bruce Tomes, Surveyor Council Offices, High-street, Mortlake	do.
Extension of Car Shed, &c.	Southend Corporation	E. J. Elford, Borough Engineer, Southend-on-Sea	do.
Offices for Supt. at Sanitary Depot, Portwood	Stockport Cleansing Committee	J. Atkinson, Borough Surveyor, Stockport	do.
Alterations, &c., Argyll Hotel, Fort William	D. Rankin	L. and J. Falconer, Architects, Fort William	do.
Street Improvement Works	Bromley Boro' Council	Boro' Engineer, Municipal Offices, Bromley	do.
Roadmaking and Paving Works	Willesden District Council	Engineer to the Council, Public Offices, Dyne-road, Kilburn, N.W.	do.
Erect. of Cottage for Engineer, Grove Hos., Tooting	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	Jan. 13
Roadmaking Works, Park Hospital, Lewisham	do.	do.	do.
Additions to Coal Stores, S.W. Hospital, Stockwell	do.	do.	do.
Erect. of Cotge. for Engineer, Brook Hos., Woolwich	do.	do.	do.
Cottage, Brook Hospital, Shooter's Hill	do.	W. T. Hatch, Engineer and Surveyor to Board	do.
Cottage, Grove Hospital, Tooting-grove	do.	do.	do.
Ad. to Stm. & Ho. Coal Bdgs., S.W. Hos., Stockwell.	do.	do.	do.
Shop and Stores, Somerset-road, Coventry	Perseverance Co-operation Society	Harrison & Hattrell, Architects, 23, Hertford-street, Coventry	Jan. 14
Taking Down and Re-erecting Council's Offices	Mountain Ash U.D.C.	J. H. Phillips, Architect, Clive-chambers, Windsor-place, Cardiff	Jan. 18
Mercantile Marine Office, Royal Albert Dock	Commiss. of H.M. Office of Wks.	J. B. Westcott, H.M. Office of W'ks, Storeys Gate, West'ster, S.W.	Jan. 19
Chapel, Victoria-street, Trealaw	.....	O. H. Evans, Architect, P.O. Chambers, Pontypridd	Jan. 21
Restoration of Shaftesbury-road School	East Ham Education Committee	R. L. Curtis, Architect, 120, London Wall, Moorgate-st., E.C.	Jan. 24
Furniture, Infectious Diseases Hospital Seacroft	Sanitary Committee, Leeds Corp.	W. J. Jeeves, Town Clerk, Leeds	Jan. 25
Composition and Terra Cotta Bricks, &c.	Edinburgh & Leith Gas Commis.	W. R. Herring, M. Inst. C.E., New-street Works, Edinburgh	Feb. 4
Cast Iron Main Pipes, &c.	Devonport Corporation	Stevenson & Burstal, 38, Parliament-street, London	Jan. 30
Excavation for Pipes, &c.	do.	do.	do.
200 Tons of Iron Slag	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, Tynemouth	No date.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
Clerk of Works	Borough of Hammersmith	£4 per week	Jan. 9
Person to select Timber, &c.	Fulham Boro' Council	£3 10s. per week	do.
Assistant Engineer for P.W. Dept., Hong-Kong	Crown Agents for Colonies	£360 &c.	Jan. 11
Clerk of Works	Aylesbury R.D.C.	£3 3s. per week	do.
Engineering Assistant, City Surveyor's Department	Public Works Com., Birmingham	£4 per week	Jan. 12
Assistant	L.C.C.	£6 per week	Jan. 21
Clerk of Works	Corporation of Dublin	£3 3s. per week	Feb. 4
Architectural Assistant	Shanghai Municipal Council	300 Shanghai Taels per month	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, x viii.

MEETINGS—*continued.*

TUESDAY, JANUARY 5.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Mr. B. R. Tucker on "Lighting." 7 p.m.

The Institute of Builders.—Finance Committee. 3 p.m. Council. 3.30 p.m.

WEDNESDAY, JANUARY 6.

Builders' Foremen and Clerks of Works Institution. Ordinary meeting of the members. 8 p.m.

FRIDAY, JANUARY 8.

Architectural Association.—Mr. Hugh Stannus on "Egyptian Architecture," illustrated by lantern views. 7.30 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.	
Hard Stocks	1	16	6	per 1000 alongside, in river.
Rough Stocks and Grizzles	1	13	0	,, ,, ,,

BRICKS, &c.—*continued.*

	£	s.	d.	
Facing Stocks	2	12	0	per 1,000 alongside, in river.
Shippers	2	5	0	,, ,,
Flettons	1	10	0	,, at railway depot.
Red wire Cuts	1	13	0	,, ,,
Best Fareham Red	3	12	0	,, ,,
Best Red Pressed Ruabon Facing	5	0	0	,, ,,
Best Blue Pressed Staffordshire	4	4	0	,, ,,
Do. Bullnose	4	10	0	,, ,,
Best Stourbridge Fire Bricks	4	8	0	,, ,,

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BRICKS (*continued*)—

	£	s.	d.	
ED BRICKS. White and ory Glazed retchers	13	0	0	per 1000 at railway depot.
lers	12	0	0	„ „ „
ins, Bullnose, ıd Flats	17	0	0	„ „ „
ble Stretchers	19	0	0	„ „ „
ble Headers..	16	0	0	„ „ „
Side and two ıds	19	0	0	„ „ „
Sides and ıe End	20	0	0	„ „ „
ys, Cham- red, Squints .	20	0	0	„ „ „
; Dipped Salt lazed Stretch- ers and Headers	12	0	0	„ „ „
ins, Bullnose, ıd Flats	14	0	0	„ „ „
ible Stretchers	15	0	0	„ „ „
ible Headers..	14	0	0	„ „ „
Side and two nds	15	0	0	„ „ „
) Sides and one nd	15	0	0	„ „ „
ays, Cham- ered, Squints..	14	0	0	„ „ „
ond Quality White and ipped Salt lazed	2	0	0	„ less than best.

	s.	d.	
ames and Pit Sand	6	9	per yard, delivered.
ames Ballast	6	0	„ „
t Portland Cement	30	0	per „ ton, delivered.
t Ground Blue Lias Lime	21	0	„ „

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

y Stone Lime	11s.	6d. per yard, delivered.
urbridge Fire Clay in sacks	27s.	6d. per ton at rly. dpt.

STONE.

	s.	d.	
TH STONE—delivered on road wag- gons, Paddington depot.....	1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms depot	1	8½	„ „
RTLAND STONE (20 ft. average)— Brown Whitbed, delivered on road waggons, Paddington depot, Nine Elms depot, or Pimlico Wharf..	2	1	„ „
White Basebed, delivered on road waggons, Paddington depot, Nine Elms depot, or Pimlico Wharf ..	2	2½	„ „

	s.	d.	
caster in blocks	1	11	per ft. cube, deld. rly. depot.
er in blocks	1	6	„ „
eenshill „	1	10	„ „
rley Dale in blocks ..	2	4	„ „
d Corsehill „	2	5	„ „
seburn Red Freestone	2	0	„ „
d Mansfield „	2	4	„ „

YORK STONE—*Robin Hood Quality.*

	s.	d.	
ppled random blocks	2	10	per ft. cube, deld. rly. depot.
in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per foot super. „
in. rubbed two sides ditto, ditto	2	6	„ „
in. sawn two sides slabs (random sizes)	0	11½	„ „
in. to 2½ in. sawn one side slabs (random sizes)	0	7½	„ „
in. to 2 in. ditto, ditto	0	6	„ „
ppled random blocks	3	0	per ft. cube „
in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super. „
in. rubbed two sides Ditto	—		„ „
in. sawn two sides slabs (random sizes)	1	2	„ „
in. self-faced random flags	0	5	„ „
opton Wood (Hard Bed)			in blocks 2 3 per ft. cube.
„ „ „			6 in. sawn both sides landings deld. rly. depot. 2 7 per ft. super. deld. rly. depot.
„ „ „			3 in. do. 1 2½ „ „

SLATES.

in.	£	s.	d.	
0 x 10 best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
0 x 12 „ „	13	17	6	„ „
0 x 10 best seconds „	12	15	0	„ „
0 x 12 „ „ „	13	10	0	„ „
6 x 8 best „ „	7	0	0	„ „
0 x 10 best blue Port- madoc	12	12	6	„ „
8 x 8 best blue Port- madoc	6	12	6	„ „
0 x 10 best Eureka un- fading green ..	15	2	6	„ „
0 x 12 best Eureka un- fading green ..	17	2	6	„ „
0 x 10 „ „	12	10	0	„ „
0 x 8 „ „	10	5	0	„ „
0 x 10 permanent green	11	10	0	„ „
0 x 10 „ „	9	10	0	„ „
0 x 8 „ „	6	10	0	„ „

TILES.

	s.	d.	
est plain red roofing tiles ..	42	0	per 1000 at rly. depot.
Hip and Valley tiles ..	3	7	per doz. „ „
est Broseley tiles.....	50	0	per 1000 „ „
o. Ornamental tiles	52	6	„ „ „
Hip and Valley tiles ..	4	0	per doz. „ „
est Ruabon red, brown or brindled do. (Edwards)	57	6	per 1000 „ „
o. Ornamental do.	60	0	„ „ „
Hip tiles	4	0	per doz. „ „
Valley tiles	3	0	„ „ „
est Red or Mottled Staf- fordshire do. (Peakes)	51	9	per 1000 „ „
o. Ornamental do.	54	6	„ „ „
Hip tiles	4	1	per doz. „ „
Valley tiles	3	8	„ „ „
est "Rosemary" brand plain tiles	48	0	per 1000 „ „

TILES (*continued*)—

	s.	d.	
Best Ornamental tiles	50	0	per 1000 at rly. depot.
Hip tiles	4	0	per doz. „ „
Valley tiles	3	8	„ „ „

WOOD.

	At per standard. £.	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	15	10	0	16	10	0
Deals: best 3 by 9.....	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0	12	10	0
Battens: best 2½ by 6 and 3 by 6..	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less thn best		
Battens: seconds	0	10	0	„ „ „		„
2 in. by 4 in. and 2 in by 6 in...	9	0	0	9	10	0
2 in. by 4½ in. and 2 in. by 5 in...	8	10	0	9	10	0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.....	0	10	0	more than battens.		
¾ in.....	1	0	0	„		
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)....	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft. average)..	3	5	0	3	15	0
JOINERS' WOOD. White Sea: first yellow deals, 3 in. by 11 in.....	At per standard. 23	0	0	24	0	0
3 in. by 9 in.....	21	0	0	22	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	18	10	0
Second yellow deals, 3 in. by 11 in.....	18	10	0	20	0	0
„ 3 in by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.....	15	10	0	16	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.....	18	0	0	19	10	0
Battens.....	13	10	0	15	0	0
Petersburg: second yellow deals, 3 in. by 11 in.....	16	0	0	17	0	0
Do. 3 in. by 9 in.....	14	10	0	16	0	0
Battens.....	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.....	13	10	0	14	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg:— First white deals, 3 in. by 11 in..	14	10	0	15	10	0
„ „ 3 in. by 9 in..	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in	13	10	0	14	10	0
„ „ 3 in. by 9 in.	12	10	0	13	10	0
„ „ battens	9	10	0	10	10	0
Pitch-pine: deals	16	0	0	18	0	0
Under 2 in. thick extra.....	0	10	0	1	0	0
Yellow Pine—First, regular sizes	38	0	0	upwards.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine oddments	20	0	0	22	0	0
Kauri Pine—Planks, per ft. cube ..	0	3	6	0	4	6
Danzig and Stettin Oak Logs— Large, per ft. cube.....	0	2	6	0	3	6
Small „ „	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube..	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch.....	0	0	7	0	0	8
¼ in. do. do.	0	0	6½		—	
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch....	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	21	0	0
American Whitewood Planks— per ft. cube.....	0	4	0		—	
Prepared Flooring—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	1	6
1 in. by 7 in. white, planed and shot	0	11	6	0	13	6
1 in. by 7 in. white, planed and matched	0	12	0	0	14	0
1¼ in. by 7 in. white, planed and matched	0	14	6	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
¾ in. by 7 in. do. do. do.	0	14	0	0	18	0
1 in. by 7 in. white do. do.	0	10	0	0	11	6
1 in. by 7 in. do. do. do.	0	11	6	0	13	6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.		£	s.	d.
Rolled Steel Joists, ordinary sections	6	5	0	..	7	5	0
Compound Girders, ordinary sections	8	2	6	..	9	5	0
Angles, Tees and Channels, ordinary sections	7	17	6	..	8	17	6
Flitch Plates	8	5	0	..	8	15	0
Cast Iron Columns and Stanchions including ordinary patterns ..	7	2	6	..	8	5	6

METALS.

	Per ton, in London. £	s.	d.		£	s.	d.
IRON— Common Bars	7	10	0	..	8	0	0
Staffordshire Crown Bars, good merchant quality	8	0	0	..	8	10	0
Staffordshire "Marked Bars"	10	10	0	..		—	
Mild Steel Bars	8	15	0	..	9	5	0
Hoop Iron, basis price	9	5	0	..	9	10	0
„ „ galvanised	17	10	0	..		—	
(*And upwards, according to size and gauge.)							
Sheet Iron (Black)— Ordinary sizes to 20 g.	9	15	0	..		—	
„ „ 24 g.	10	15	0	..		—	
„ „ 26 g.	12	5	0	..		—	

METALS (*continued*)—

	Per ton, in London. £	s.	d.		£	s.	d.
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12	15	0	..		—	
Ordinary sizes to 22 g. and 24 g	13	5	0	..		—	
„ „ 26 g.	14	5	0	..		—	
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	16	0	0	..		—	
„ „ 22 g. and 24 g.	16	10	0	..		—	
„ „ 26 g.	18	0	0	..		—	
Galvanised Corrugated Sheets— Ordinary sizes, 6 ft. to 8 ft. 20 g	12	15	0	..		—	
„ „ 22 g. and 24 g.	13	5	0	..		—	
„ „ 26 g.	14	0	0	..		—	
Best Soft Steel Sheets, 6ft. by 2ft. to 3 ft. by 20 g. and thicker..	11	15	0	..		—	
Best Soft Steel Sheets, 22 g. & 24 g	12	15	0	..		—	
„ „ 26 g	14	0	0	..		—	
Cut nails, 3 in. to 6 in.....	9	5	0	..	9	15	0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £	s.	d.		£	s.	d.
LEAD—Sheet, English, 3lb. and up	13	17	6	..		—	
Pipe in coils	14	7	6	..		—	
Soil pipe	16	17	6	..		—	
Compo pipe	16	17	6	..		—	
ZINC—Sheet— Vieille Montagne .....ton	26	5	0	..		—	
Silesian	26	0	0	..		—	
COPPER— Strong Sheet..... per lb.	0	0	10½	..		—	
Thin ..... „	0	0	11½	..		—	
Copper nails..... „	0	0	11	..		—	
BRASS— Strong Sheet ..... per lb.	0	0	10	..		—	
Thin „	0	0	11	..		—	
TIN—English Ingots .... „	0	1	3	..		—	
SOLDER—Plumbers' .... „	0	0	6	..		—	
Tinmen's ..... „	0	0	8	..		—	
Plowpipe ..... „	0	0	9	..		—	

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds.....	2d.	per ft.	delivered.
„ fourths	1½d.	„	„
21 oz. thirds.....	3d.	„	„
„ fourths	2½d.	„	„
26 oz. thirds.....	3½d.	„	„
„ fourths	3d.	„	„
32 oz. thirds.....	4½d.	„	„
„ fourths	4d.	„	„
Fluted sheet, 15 oz.	2½d.	„	„
„ 21 oz.	3½d.	„	„
⅛ Hartley's Rolled Plate.....	1½d.	„	„
3/16 „ „ „ „	2d.	„	„
¼ „ „ „ „	2½d.	„	„

OILS, &c.

	£	s.	d.
Raw Linseed Oil in pipes or barrels.. per gallon	0	1	8
„ „ „ in drums..... „	0	1	11
Boiled „ „ in pipes or barrels.. „	0	1	11
„ „ „ in drums..... „	0	2	2
Turpentine, in barrels ..... „	0	3	8
„ in drums..... „	0	3	10
Genuine Ground English White Lead per ton	19	0	0
Red Lead, Dry ..... „	19	0	0
Best Linseed Oil Putty..... per cwt.	0	7	6
Stockholm Tar .....per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish.....	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple.....	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel.....	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan.....	0	16	0
Oak and Mahogany Stain.....	0	9	0
Brunswick Black	0	8	6
Berlin Black.....	0	16	0
Knotting	0	10	0
French and Brush Polish.....	0	10	0

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ALNWICK.—For the conversion of St. James's Manse into schools, &c., for the Managers, St. James's Church, Alnwick. Mr. Geo. Reavell, jun., Alnwick :—

Mason: R. & G. Brown, Amble, Acklington*	£295 0 0
Joiner: J. Short & Son, Alnwick* ..	385 0 0
Plumber: Reavell Bros., Alnwick*....	96 7 4
Slater: Mrs. T. Wood, Lisburn-street, Alnwick*	62 7 0
Plasterer: T. H. Darling, Bondgate, Alnwick*	95 0 0
Painter: A. Robertson & Son, Bondgate, Alnwick*	48 0

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BRADFORD.—For the erection of a hospital pavilion at workhouse, Horton-lane, for the Guardians. Mr. Fred Holland, engineer, 11, Parkinson's-chambers, Hustlergate, Bradford :—

Mason: Jno. Moulson & Sons, Ltd., Bower-street, Bradford‡	£8,740	0	0
Joiner: E. Fearnley & Sons, Trafalgar-street, Bradford	2,180	0	0
Plumber: R. Townend, Croft-street, Bradford	1,299	0	0
Slater: Geo. Wilkinson, 12 Burnett-avenue, Bradford‡	277	15	6
Plasterer: A. & S. Wheater, 85, Hunslet New-road, Leeds‡	1,810	8	6
Painter: Wm. Townson, Holme Top-street, Bradford‡	118	10	9½
Electrician: G. A. Steinthal, 41, Piccadilly, Bradford‡	288	0	0

‡ Revised.

BURNLEY.—For the construction of two sewage tanks at the Altham Sewage Works, etc., for the Corporation. Mr. G. H. Pickles, A.M.I.C.E., Town Hall, Burnley :—

J. H. Heap	£2,765	8	9
Exors. of H. Broadley	2,323	5	10
M. & J. W. Heap	2,066	5	8
J. & G. Dubury	2,062	2	10
G. Hunter	1,916	3	6
Clegg Bros.	1,884	15	0
Thos. Smith, Burnley*	1,720	0	0

CARLISLE.—For erecting out-offices, Ashley-street Schools, for the Education Committee. Mr. H. C. Marks, surveyor, 36, Fisher-street, Carlisle :—

Wm. Baty	£169	18	3	J. & R. Bell	£144	12	3
Jas. Beaty	164	0	0	E. J. Hill	143	0	0
Wm. Batey	154	0	0	John Laing & Son	140	0	0
J. H. Reed, Sons, & Co.	152	3	6	Wm. Latimer	153	9	2
Joseph Hindson	151	3	0	G. Hill & Sons*	138	11	9

[All of Carlisle.]

COVENTRY.—For extension of bays 6 & 7, Upper York-street, for Messrs. Alfred Herbert, Ltd. Messrs. Tait and Herbert, architects, Leicester and Coventry :—

Hancox & Co.	£1,659	Isaac & Son	£1,526
R. Wootton	1,650	Bowles & Son, Leicester*	1,470
C. Garlick	1,611		
Gray Hill	1,586		

For Bay 18.

R. Wootton	£940	0	Kelley & Son £906 10
Isaac & Son	910	10	Gray Hill* 890 0

[All of Coventry.]

COVENTRY. — For machine-shop extension for "Premier" Cycle Co. Messrs. Tait & Herbert, architects, Leicester and Coventry :—

Hancox & Co.	£605	Isaac & Son	£550
R. Wootton	605	Gray Hill	549
Kelley & Son	572	Bowles & Son*	534
C. Garlick	570		

For New Scouring Shop.

Utley	£326	Kelley & Son	£238
R. Wootton	280	Isaac & Son*	211
Hancox & Co.	241		

EAST GRINSTEAD.—For street works, Cantelupe-road (portion), De la Warr-road (portion), and Chequer-road, for the Urban District Council. Mr. W. E. Woollam, Engineer and Surveyor, Council Offices, London-road, East Grinstead. Quantities by the Surveyor.

	Contract No. 1 £ s. d.	Contract No. 2 £ s. d.
A. C. Soan	2,303 19 11	374 5 9
W. Langridge	2,257 12 6	335 5 0
E. H. King	2,202 13 4	326 17 10
J. S. Pickard	2,101 15 10	281 0 0
C. H. Gasson	2,049 15 8	323 17 0
Lawrence & Thacker	2,030 2 6	383 16 9
C. S. Jenks	2,025 2 2	325 1 2
A. Catley	1,953 2 4	320 0 0
Peerless Dennis Co.	1,858 10 0	323 0 0
H. Young	1,804 16 0	264 18 0

LEEK.—For the erection of a caretaker's house on the Town's Yard, for the Urban District Council. Mr. W. E. Beacham, C.E., surveyor :—

Thos. Grace	£500	Jas. Heath*	£325
H. Wilson	349	Wm. Turner	310
S. Salt	337		

[All of Leek.]

[Surveyor's estimate, £350.]

LONDON.—For the erection of a warehouse on the East Quay of the Regent's Canal Dock, for the Regent's Canal and Dock Company, under the supervision of Mr. John Glass, manager. Plans, &c., by Messrs. Thomas & Thomas, Paddington:—

Perry & Co.	£3,131	Patman & Fotheringham	£2,679
Bull & Esdaile	2,900	Watts, Johnson, & Co.	2,648
W. Gladding	2,871	Chessum & Sons	2,634
J. R. Ward	2,773	G. Godson & Sons	2,596
Richards & Co.	2,749	Sheffield Bros.*	2,595
Kirk & Randall	2,744		

LONDON.—For making up roadway, paving footways of Dundalk-road, and for other work, for Deptford Borough Council :—

Fry Bros., Norman Road, Greenwich, S.E. £873 0 0

LONDON.—For forming, paving, and kerbing portions of footways in Woodberry Down, Stoke Newington, N., for the Borough Council. Mr. W. F. Loveday, Borough Surveyor, Town Hall, Milton-road, Stoke Newington :—

Imperial Stone Co.‡	£751	2	9
Adamant Stone and Paving Co.	748	10	9
Griffiths & Co., Ltd.	712	19	0
Grounds & Newton	702	6	0
Patent Victoria Stone Co.§	685	5	3
Empire Stone Co.	670	16	6
Geo. Porter	669	17	10
F. Barry	612	18	4
A. T. Catley & Co.‖	585	0	0

‡ "Imperial" stone. § For indured paving; add £97 16s. If Victoria stone is used. For Cumberland stone: If "Imperial" stone is used add £75.

MALLOW (Ireland).—For erecting sixteen artisans' dwellings for the Urban District Council. Mr. Brian E. F. Sheehy, architect, 57, George-street, Limerick :—

C. Kelleher	£4,000	John O'Keeffe, Mallow, co. Cork*	£2,160
J. J. Coffey	2,791		

REDRUTH.—For erecting business premises, Fore-street, Redruth, for Mr. W. Snell. Mr. Sampson Hill, architect, Green Lane, Redruth :—

R. Jacob	£1,115	0	0 Hodge & Opie* £1,012
S. Head	1,089	10	0 T. Martin 690
J. Odgers	1,036	0	0

[All of Redruth. Terra-cotta facings and iron girders and columns extra to above prices.]

SOUTHEND-ON-SEA.—For constructing an 18in. stoneware storm-water pipe sewer about 700 yards in length, High-street and Pier-hill, for the Corporation. Mr. E. J. Elford, Borough Surveyor, Southend-on-Sea :—

Buxton & Jenner	£966	W. Iles, Southend*	£850
J. Jackson	902	J. Summerfield	806
Philbey	933		

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The Builder.

VOL. LXXXVI.—No. 3179. JANUARY 9, 1904.

ILLUSTRATIONS.

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Plans }
Hallyards—Peeblesshire ....Mr. R. S. Lorimer, A.R.S.A., Architect.
St. Andrews, Helsingfors ....Mr. R. S. Lorimer, A.R.S.A., Architect.
Cottage, Beccles....Mr. W. A. Pite, F.R.I.B.A., Architect.

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The History of the Easement of Light.

ARCHITECTS, surveyors, and lawyers have grown so accustomed to regard the easement of light as a part of the law of the land, that they pay little or no regard to its history. No doubt, for the practical purposes of to-day, for the purpose of deciding whether the light to a particular window is or is not obstructed, the history of the growth of the easement is a matter of small importance. But no one, whether he be architect or lawyer, who takes a larger view of his calling than the mere hand-to-mouth practitioner, can properly be ignorant of the outlines of the growth of the easement.

It is not unreasonable to say that the origin or the foundation of the English easement of light—the right which exists in a dominant tenement to the enjoyment of light over a servient tenement—may be found in the Roman jurisprudence, where the right to light formed part of the *jura prædiorum urbanorum*, or prædial urban servitudes. But this, though termed an urban servitude, related to houses both in country and town. It occurred in two forms, either as a *servitus altius non tollendi*, by which the owner of the dominant could prevent the owner of the servient tenement from raising his house beyond a certain height in other cases than those in which his light was obstructed, or as a *servitus ne luminibus officiatur*. This latter form is that which is most nearly identical with our modern servitude, because the owner of the servient tenement was then bound not to obstruct the light of the dominant tenement. (Instit. Lib. ii., tit. 3; Digest, Lib. viii., tit. 2, ss. 1, 2, 3.)

But the idea that this portion of Roman law is the basis of our modern English law on this subject can only be supported by a train of reasoning from historical facts and not by any direct evidence. It is now indisputable that the mediæval lawyers of England—of whom the most celebrated is Bracton, or, more correctly, Henry of Bratton, who lived, judged, and wrote in the middle of the thirteenth century—studied Roman law, and, in consequence of their studies, incorporated its principles in what has become known as the English Common Law. "Bracton's debt," wrote the first of modern English legal historians, "and, therefore, our debt, to the civilians is inestimably great. But for them his book would have been impossible." (Pollock and Maitland, "History of English Law," i., 187.) But Bracton—like others who studied the Roman jurisprudence—was a judge of assize, and it would be contrary to all experience to suppose that, in deciding legal questions as judges, these men should not have shown the influence of their studies. This, then, is the manner in which the previously stated conclusion is reached, and not by the appearance in an ancient legal decision of any actual and direct reference to a particular passage in Roman jurisprudence.

The easement of light is one which would only become important in a highly civilised community and in towns. When there was neither civilisation nor towns there could, of necessity, be no obstruction of light, and one may perhaps go as far as to say that, until houses in towns grew to a considerable height, the question of obscuration could scarcely be one of any importance. As soon, however, as this easement begins to appear in the law courts we find it to be in a curious and interesting state. We perceive, in fact—generally speaking—a legal right to the easement in country places and no right in towns. In Rolles' "Abridgement" (ii., 140) we find stated what seems to be the earliest decision on the subject, a judgment of Justice Markham—presently to be Chief Justice of England—in 1444, in the twenty-second year of the reign of Henry VI. Rolles' book was published in 1668, but it would seem that he copied his passage from some ancient record, since it is printed in mediæval French. "*Si jeo un meason per prescription sur mon soile, et un auter erca un novel meason sur son soile desmesne prochein adjoynt cy pres al mon meason que ceo estopp le lumier de mon meason, ceo est un Nusans al mon meason, car le lumier est de grand comfort et profit al homes.* 22 Hen. VI., 15, per Markham." "If I have a house, and my neighbour builds so as to obscure the light, that is a nuisance, for light is a comfort and a profit to a house." Here we have a large principle stated broadly without any qualifications—the owner of a house which has enjoyed light thereto is not to be deprived of it by a new building. And on this pleasure of light, and on the disagreeableness of darkness, we find constant stress laid from that time forth. But with this natural and laudable longing for light there presently came into conflict the desire to see flourishing and well-populated cities—a desire which implied

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contiguity of habitation, and consequently from time to time a lessening of the quantity of light enjoyed by houses in cities. And so a legal custom grew up in towns—certainly in London and in York, and we may presume in all the important towns of England—to permit the building of a house to any height even though it should thereby obscure or even totally destroy the light entering an adjoining house. It was a good custom, having "a lawful commencement or reason in cities and boroughs; for if a tradesman has settled himself in a commodious part of the city, but if he increases in his trade and his house becomes too small for his company, he may build higher for his better habitation, and it is well allowable, for it tends to the peopling of cities and to the encouragement of tradesmen in such places." (Hughes *v.* Keme, "Yelverton's Reports," 215 (1612).) This is a good plain, commonsense reason, and one may perhaps regret that it has not continued to be the basis of the law of England, for there can be no doubt that the easement of light is one which, however useful to the dominant tenement, is singularly burdensome on and injurious to the servient tenement. But the general principle which underlay the custom of London and other towns was limited by an important qualification—that the right to obscure the light of a dominant tenement could only exist when the newly-erected servient building was on the exact foundations of an old building. See Aldred's case, 9 "Coke's Reports," 58*b* (1611), which contains interesting references to older decisions. This limitation was in time necessarily fatal to the custom, because it limited it locally and gave free scope, outside very defined areas, to what may be called the principle of Roman Law. The truth was that the good sense of our ancestors recognised the desirability of free building in cities; but want of foresight, an incapacity to look ahead to the growth of towns, and possibly the force of the Roman principle, antagonistic as it was to local customs, caused such a limitation of this custom as to render it certain that, sooner or later, it would be destroyed by the general principle.

The year of destruction was 1832, when, apparently without remonstrance, the Government passed (in August) the Prescription Act, by which all local customs as to the easement of light were abolished, and a dominant tenement became entitled to an indefeasible right to light if it had been enjoyed for twenty years, and English jurisprudence on this subject became assimilated to the system which had prevailed in Italy two thousand years earlier. The right to the enjoyment of light became vested in the dominant tenement by a purely prescriptive title. Thus an end was put to the question whether the really prescriptive title which had existed before 1832 was based, as some lawyers argued, on a lost grant, or an implied covenant by the owner of the servient tenement not to obscure the light of the dominant tenement—a contention which shows the strength of legal fictions and the ingenuity of English lawyers in reconciling feudal theories with actual facts. For, since where there was no owner of land the King was lord, no title to land could be gained without a grant, and so it was argued that wherever a right to light existed, there must in a distant past have been a grant of the easement.

But though the principles of Roman Law thus became universal in England in 1832, it is curious to note that at no time did they ever largely prevail in the United States, where the progressive character of American society has caused the old English customs of London and York to form the basis of the law. In the States of New York, Massachusetts, Maine, Connecticut, Pennsylvania, South Carolina, Alabama, and Maryland it has been definitely decided that there is no right to the easement of light by prescription. The reason was clearly stated long ago, "it (the easement) is an anomaly of the law. It may do well enough in England, but it cannot be applied in the growing cities and villages of this country without working the most mischievous consequences." (Parker *v.* Foote, 19 Wendell, 309 (Supreme Court of New York, 1838).) It is obvious that the reasoning is equally applicable to the growing cities of Great Britain. The practical results of the American law are the enormous buildings, which form so characteristic a feature of the cities of the United States.

Among European nations we naturally find this easement to exist. In France it is a servitude, and falls within the category of the servitudes referred to in the Code Napoléon. (Code Civil, Leo. II., tit. vi., ch. iii.) In Germany, too, the easement is legally recognised (Bürgerliches Gesetzbuch, par. 1018, 1019), ceasing to exist only by one of three causes—by loss of its value, by agreement, or by continued obstruction. Thus it would seem that the United States is the only nation which does not, in some form or other, recognise the validity of the easement of light.

THE CHICAGO THEATRE CATASTROPHE.

THE terrible calamity at Chicago gives reason for serious thought amongst all interested in theatre construction or management. Putting aside all the sensational elements, the fact remains that many hundreds of lives have been lost in a modern building standing in a city that has fairly modern building regulations and a first-class fire brigade, and has had a bitter experience of earlier fire catastrophes.

Pending authentic information, we will assume that the origin of the fire was due to an arc-light getting out of order. We will further assume that the fire-resisting curtain did not work properly; that the stage management was defective; that the theatre fireman applied his energies in the wrong direction; and that the stage mechanics lost their heads. For all that, we consider that such a terrible calamity should have been impossible, and, what is more, that it can be made impossible in the future. The series of unhappy circumstances which we have assumed are exactly the series of accidents that must be guarded against by those who build, equip, and control theatres. The human element of mishaps and excitement must be considered besides the possibility of a sequence of such mishaps and circumstances. There is, however, not the slightest reason why even a yet greater series of mishaps should result in a catastrophe. What we require is safety for the public and for the actors, no matter what be the character of the accident, or what be the complications or blunderings arising therefrom.

If we turn to the record of the International Fire Prevention Congress held in London in July last, we find the following opinions expressed:—

Re Theatre Safety.

THE Congress considers:

1. That the first essential for the safety of the public attending theatres is the provision of easy means of exit from the auditorium by *direct* and clear routes of exit as distinct from circuitous routes.
2. That next in importance to the provision of exits, the safety of the public requires the provision of suitable fire watches and careful fire survey with the view to the prevention of fire.
3. That the safeguard third in the scale of importance is the provision of automatic sprinklers over the stage.
4. That questions of suitable construction, fitting, and equipment only rank after the above three primary safeguards for the protection of the public.

These resolutions, embodying the combined opinion of those best versed in the subject, clearly indicate the policy to be pursued if the public safety is to be guarded.

Whilst in one country the public authorities cannot agree on a pattern of panic-bolt, or the exact dimensions of the rise and tread of a theatre staircase, in another country we find experts debating as to whether asbestos curtains or iron curtains are the best. Again, in one capital city the theatre managers and the local authorities may be debating whether some form of impregnated wood should be used or not, and in another city they may be disagreeing whether the lime-light is to be superseded compulsorily by the electric light or not. Concrete floors are argued for and against, armoured wood doors discussed *versus* iron doors; but, above all this, the one plain element of safety remains, and that is—*ample exit facilities*. Whether the exit be over a concrete staircase or one of hardwood; whether the exit be through an iron door or a wooden door; whether the panic-bolt be pattern A or pattern B, is immaterial, as long as the exit is a plain, straight exit with no circuitous route, and leads directly into the street. Again, no matter what may be the safeguards of construction, supervision, revision, and surprise visits, what is wanted on the spot when an accident occurs is a staff of *self-possessed, well-trained firemen of experience*. We say firemen advisedly, for we believe in numbers. We advocate the "fire-watch" of first-class well-paid firemen. The bogus fireman of the general servant type is not only useless but dangerous. Only men of nerve, to whom fires of all sorts are a common occurrence, are the men who should form the "fire-watch" of a theatre.

Next, with regard to fire extinction; the stage sprinkler is one of the few automatic appliances which will, as a rule, do its duty effectively and reliably. It should be applied over all theatre stages, as the extinction of the fire becomes automatic with its aid.

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Given, as the Congress very wisely resolved, these three primary elements of safety, it may be possible for any number of accidents to occur in a theatre without loss of life either from fire or panic. All the other safeguards to be found in theatre regulations naturally reduce the possibility of fire, and are of eminent value in preventing the possibility of panic; but without the three primary elements named they are practically useless, for should a mishap occur disastrous consequences are probable. Better construction—in fact, fire-resisting construction of the first order—must be strongly advocated for a theatre. But, again, no matter how excellent and how fire-resisting the construction, the absence of the above three primary principles would preclude safety for the public. The building would perhaps not be much damaged—as apparently it has not been in the case of Chicago—there would be no conflagration as understood by that term; the theatre manager's pecuniary loss and the insurance companies' pecuniary loss would no doubt be less; the possibility of fire is also reduced by good construction. But, given the outbreak of fire without the above-named primary provisions, the result must be of the same disastrous character.

We purposely avoid discussing the actual fire at Chicago in detail until we have full particulars; but we anticipate that the British Fire Prevention Committee, with the aid of its foreign correspondents in the United States, will, as usual, prepare a report that will be of technical utility to all concerned.

It will be probably very difficult to get at the true occurrences on this terrible occasion. There will be so many interests and counter interests at play that the truth will be difficult to arrive at. We of course know that the American Press, as well as our own, considers that the building regulations of Chicago have not been properly administered in this case; and we all are sure that much was done and much occurred that should not have been; but it would hardly be right for us to express an opinion on the administration of a public building department in another country without having received full and impartial particulars.

One matter, however, we should still like to refer to, and that is the general laudatory tone in the public Press in respect to the efforts of the much-abused London County Council to improve theatre safety in this metropolis. Writings by amateurs and enthusiasts outside our official hierarchy resulted in the London County Council's theatre department taking up the matter, first in a somewhat haphazard, but recently in a very businesslike and tactful, manner. The legal position and unpopularity of the Council have all been against good work. But good work has been done, and particularly during the last few years it has been done in a most able and systematic manner, without pressing too hardly on the vested interests of theatre management.

For new London theatres, as distinct from old, we would strongly advocate that the regulations should be immediately revised and strengthened in the direction of the three primary principles of theatre safety above named, and that these should be rigorously enforced. In the old theatres we trust that the tactful management of the officials of the London County Council will lead to the maximum amount of safety being obtained in the same direction, as far as is practicable under the very difficult existing circumstances under which our old theatres are managed and conducted.

THE ROYAL ACADEMY LOAN EXHIBITION.

THE most interesting feature in the thirty-fifth loan exhibition at Burlington House, opened this week, is that there is one gallery devoted to sculpture and bronzes. The usual neglect of sculpture in what are called exhibitions of "old masters" is of course quite comprehensible. Ancient works in sculpture are far less numerous than paintings, especially in English collections, and owners are less willing to lend sculpture than painting; the risk in transport is greater. In the present case nearly all the ancient work in sculpture consists in small bronzes of the Renaissance epoch, lent by a few collectors. Many of these are interesting, but we confess that we do not feel much enthusiasm for collections of this class of work. They are the kind of things which are classed in catalogues as *objets d'art*, and are bought by collectors rather for their rarity and as drawing-room or library ornaments than for any consideration of their individual artistic beauty or significance. Many of the things in these cases are of little abstract beauty, and their artistic effect is still further lessened by the polished finish which all the best modern sculptors who produce miniature work in bronze avoid, preferring the dead surface *patina* of the material. As examples of work of a former period these collections are historically interesting, but many things among them would be thought commonplace if produced by a modern sculptor. Among those which have a special interest are the bronze pedestal enriched with figures, masks, and eagles, and surmounted by a figure of Pan (No. 6 in Case B)—this is a remarkable piece of work into which the artist, whoever he was, put his whole heart; the "Florentine Boar," by Susini (C 16); the figure of a boy in the same case (C 18), the small lion (E 17) attributed to Donatello, and Briosco's curious fancy representing Pomona seated on the back of a grotesque terminal figure of Pan (C 17). In the black and white room there are four large knockers (not polished up) which are superb specimens of this class of work, worthy to hang on the doors of Renaissance Italian palaces; No. 23 is particularly fine in the clever manner in which the two lions are designed so as to form the sides of the knocker. Among the separate objects in the larger room Adrien de Vries's bronze relief of an allegorical subject (No. 1 in catalogue), lent by the King, is a fine and spirited piece of work.

The real interest of this section of the exhibition lies however in the examples of the work of two recently deceased English sculptors, Harry Bates and Onslow Ford. The latter indeed could not be fairly judged of by the work here, his finest productions being on too large a scale for loan exhibition; but we have his beautiful little recumbent marble figure, "Snowdrift," the bronze pedestal and nude figure entitled "Applause" (a far more interesting work than any Renaissance bronze in the room), and two or three beautiful marble busts, with other small studies. Harry Bates is very well represented by his four relief panels, "Homer," "Socrates," "The Story of Psyche," and "Dido and Æneas." These are sculpture of a high order both in design and feeling. Nothing could be better in decorative line than the group of the two reclining figures listening to Homer. Two small highly-finished marble busts show another side of the work of this fine sculptor, whose early death was so great a loss to English art.

In the picture-galleries this is a Lawrence year. This courtly artist and courtly portrait-painter has suffered an eclipse of fame for a considerable period, and seems now to be "revived" with perhaps a little exaggeration of his claims; indeed the French have latterly made a sort of idol of him; it is difficult to understand why, since his artistic qualities are not of the kind which in general finds favour with the modern French school of artists and critics; but French attitude towards English artists has always been somewhat capricious and inexplicable. The dating of some of Lawrence's portraits here (they are not all dated) does not entirely bear out the criticism we have seen passed upon him—that he became after a certain period hopelessly mannered and theatrical in his style of portraiture. Lawrence died in 1830, and the half-length of the Earl of Liverpool, exhibited in 1828, is as simple and straightforward a piece of portrait-painting as could be desired. The celebrated portrait of "Master Lambton" (52), exhibited in 1825, is theatrical enough, but one cannot deny its charm. The group of "Mrs. Angerstein and Child" (62) is exceedingly pretentious and stilted in treatment; there is no date to this, but one would imagine that it was a late work. But there are some very fine portraits among the numerous examples here collected. Lawrence was not such a master of colour as Reynolds, but in the portraits of "Lord Ribblesdale" (92) and "Miss Farren" (106) he comes very near Reynolds in other respects. It is noteworthy that in his diploma picture, a half-length of "A Gipsy Girl" (55) holding a white hen in her hands, and which is quite different in colour and treatment from any other of his works here, he was evidently thinking of Reynolds and endeavouring to a certain extent to emulate the class of works in which the older painter made a figure of a child the occasion for a special study in colour effect. On the whole, though Lawrence's fame is to some extent *passé* now, and he is not a painter to arouse much enthusiasm, we think the Academy did well to make a special feature of his works for once. He filled an important place in English painting in his day.

The early pictures are in the first

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gallery this year, instead of the last. They include a very fine Botticelli, "The Virgin and Child with Angels" (20), the angel figures including that beautiful child head with the brown locks that Botticelli was so fond of; and a fine and well-known Filippo Lippi, "The Annunciation" (25). The large "Holy Family" by Filippino Lippi (13) looks as if it had been very much restored. Opposite to this is a large "Virgin and Child," by Piero di Cosimo (32), a picture in wonderful preservation, but which looks in a more genuine condition than the last-named. Among the other works in this room is a very interesting small "Pietà," by Memling (1), a group of figures round the dead Christ, very carefully painted and very marked in character, and through the window a distant landscape very minutely represented. It is curious indeed to notice this careful attention to landscape as an accessory in the days before landscape-painting became a special branch of art. We see it again in the view from the window in Maître de Flemalle's "Virgin and Child" (4). Among others to be specially mentioned are the "Lady Reading," labelled only "Flemish School" (8); the "Virgin and Child" and "Pietà," two subjects in one frame (19), a typical example of the Sienese School; and the elegant and beautifully drawn little nude figure called "St. John Baptist" (21), by Andrea del Sarto, which, in its combination of correct execution with total absence of feeling, reminds one so much of Browning's poem on this painter. The half-length of a "Young Man, with Hand on Skull" (32), is a fine picture of its school, and may be by Giorgione, whose name, however, is surrounded by almost as many questionings as that of Da Vinci. Pinturicchio's "Camp Scene" (28) is amusing in Pinturicchio's way; the small series of "Judith and Holofernes," by Veronese, is notable only for the closing one, showing the sleeping Holofernes and Judith with the sword (38), which is marked by dramatic spirit; and Bronzino's "St. Catherine" (34), in spite of disagreeable colour and texture, is a half-length of great dignity and nobility of character.

The large gallery is a mingled collection. It includes a large landscape labelled "Rubens" (66), but which it appears by the account was only completed by Rubens after its commencement by Verhulst; it shows the dreary and arid mountain landscape of Spain surrounding the Escurial, and is about as dismal a specimen of landscape-painting as one could well encounter. Among the fine works are Vandyck's Charles I. and his Queen (74 and 78), from the Marquis of Northampton's collection, and his highly characteristic portrait group of two insolent young patricians (76), both of whom no doubt fought well, and were both killed in battle, one at Alresford and the other at Naseby. This picture was at a former exhibition not so very long ago; we remember remarking on it; it would be impossible to find a work more characteristic both of the painter and of the type of society which he painted. Vandyck astonishes us, too, by a quasi-religious painting of "A Magdalen" (88), as insincere and theatrical as anything could well be; and Nicolas Poussin by two religious pictures, "Confirmation" and "Extreme Unction" (84 and 86), which, however, are very interesting and seem painted with real feeling. Gaspar Poussin's "Classical Landscape" (90) is a noteworthy example of the school in which nature was used as the material for composition without any care for truth of detail; looked at from the middle of the room it is a most carefully balanced composition, with a beautiful effect of distance; on a closer view it is all spoiled by the mechanical and conventional character of the foliage. A large and very fine example of Canaletto is also to be noted—a view of Verona (68), the buildings finished *con amore*. A curious point in it is the strongly marked shadow thrown on the surface of the water from the buildings on the left. Either Canaletto must have been rather confused in his mind between the phenomena of shadow and reflection on water, or the Adige must have been a very turbid river when the picture was painted. Among the other works of note in this room are a very fine half-length portrait by Hoppner (89), the head beautifully painted; Reynolds's monumental portrait of the Marquis of Granby (94), with a grand horse in it; Velasquez's portrait of his servant Pareja (79); an early Titian (72); and a fine half-length by Raeburn of James Byers (99), the architect and antiquary, a friend of Byron and Gibbon, and with a noble head—an interesting picture in every sense.

In Gallery IV. Sir Francis Grant has his turn, and we are brought to early Victorian art by his hunting pictures and his portrait of Mrs. Markham walking in the snow (113), which once excited great admiration. How far off it seems now! The portrait of Grant, painted by himself, is almost amusing in its Philistinism. In the next room some early works by Sidney Cooper show that he did not always paint cows like hair trunks. The old artist did himself sad injustice by going on painting after his perception and execution were alike on the wane. Judged by such works as Nos. 124 and 140, his reputation is a solid and lasting one, more so than that of the other two recently deceased academicians who are represented. Among these tame and academic pictures Sam Bough's "Dunkirk Harbour" (125), the work of a painter of strong and original genius, makes its mark in an unmistakable manner. His other picture, "Storm; Bass Rock" (129), is spoiled by a bad and theatrical sea. That was before the advent of the group of English painters who have placed English art at the head of all the world in sea-painting.

STATUE, DALLINGTON.—An addition has been made to the sculptured reredos in the parish Church of St. Mary, Dallington, in the shape of a new statue for one of the vacant niches. This reredos was designed by Messrs. Law and Harris, architects, of Northampton, with the intention of filling its twelve niches with sculptured figures of the Apostles, which Mr. Harry Hems, of Exeter, was commissioned to carry out. Funds, however, have not permitted the whole series, as yet, to be done, and up till recently eight statues have occupied the niches destined for their respective receptions. These are SS. Peter, John, Paul, Philip, Matthew, James the More, Andrew, and James the Lesser. Another statue has just been placed *in situ*, and it represents St. Thomas, surnamed Didymus.

NOTES.

The Registration Meeting at the Institute.

THE meeting at the Institute last Monday, at which the great question whether registration for architects is desirable or not was to be argued out, resulted in an almost ludicrous anti-climax, the promoters of the resolutions (printed in the first article in our last issue) having apparently taken fright at the last moment and abandoned their first resolution, contenting themselves with a slightly altered second resolution, to the effect that a committee of the Institute and Allied Societies should be formed to consider and report on the desirability of registration. This, of course, commits no one to anything, and was therefore voted for almost unanimously as a *modus vivendi*. Our own feeling is that the promoters of registration ought not to have been allowed to abandon their first resolution. The wish to do so was a notable confession of weakness, and if the resolution had been discussed and not carried the subject would probably have been entirely shelved for a long time to come. We must compliment the president of the Manchester Society on his good-tempered, moderate, and well-expressed speech in seconding the altered resolution, which was listened to with pleasure by all parties; but otherwise we do not think the promoters of the movement did much to recommend it. We may allude to one possibility hinted at by an old member of the Institute in his speech against the movement—that if a Registration Act was passed "he had no doubt about his course." We believe that in such an event a good many eminent architects would refuse altogether to be included in the list, and would simply drop the term of "architect." There is more than one way in which it would be possible to do this and carry on their work just the same. It would be an amusing result if the passing of a Registration Act led to the term "architect" becoming a badge of inferiority!

Preservation of Ancient Monuments in India.

THE bill introduced by Sir Denzil Ibbetson into the Viceroy's Legislative Council empowers the Government to declare that any privately owned ancient monument is a "protected monument," whereupon the owner will be given the option of committing it to the guardianship of a Government official, for maintenance by the State, with free access for the public, or of making some mutually satisfactory arrangement with Government. If neither of those courses is found to be possible, the endowment (if any) attaching to the monument is to be compulsorily applied to its purpose, or, failing compliance therewith, the State will be enabled to acquire the place or structure—provided no part of it is periodically used for religious observances—under the Land Acquisition Act. The bill confers upon the State a right of pre-emption, under certain conditions, as to its purchase by the owner's family or by his own religious association, of any protected monument. The measure extends to antiquities of a movable nature, and to the prohibition or restriction by the Governor-General in Council of the

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importation into, or exportation out of, any part of British India of any specified class of antiquities, whenever he has reason to believe that such sale or removal will be to the detriment of India or of any neighbouring country. The term "antiquities" does not cover certain antique or artistic objects, but includes objects having an archæological or historical interest. The bill seeks further to prevent the removal of archæological remains from the vicinity of their site or building, and to restrict or regulate excavations within any local area, subject to the payment of compensation for loss occasioned thereby.

Sir Oliver Lodge on Radium.

IN the lecture delivered at Birmingham on Tuesday last, Sir Oliver Lodge presented an excellent account of the development of knowledge relative to radium and allied substances, which may be particularly commended to all who have not found time to follow recent literature on the subject. One admirable feature of this latest utterance was that the lecturer discouraged the wild theories started by some imaginative writers, who have professed to find in radium a substance making perpetual motion possible, abolishing the law of the conservation of energy, and revolutionising the first principles of science. Although the results of recent investigations compel us to modify some general assumptions that were made a quarter of a century or more ago, and until lately have been acted upon by scientists, it is probably correct on the whole to say that the most modern revelations tend less to upset than to elucidate previous conceptions. Perhaps the most remarkable lesson taught is that atoms of matter are not permanent, as formerly believed. Still, so far as concerns the ephemeral purposes of man, all ordinary substances behave as if their constituent atoms were actually permanent, and the secrets revealed to the most advanced scientists do not now, and may never, affect the practice of those engaged in technical pursuits. In the succession of theoretical and experimental investigations so lucidly described by Sir Oliver Lodge, it is interesting to observe a statement of the opinion that our present idea of the atom is largely due to Professors Larmor and Thomson, who demonstrated the existence of electricity in the form of small particles, or electrons, of which we now believe atoms of matter to be constituted. These atoms are crumbling and decaying, for nothing material is permanent. As for the further question whether they must not also be forming and coming to the birth, Sir Oliver Lodge tells us this is the next thing to be looked for.

American Iron and Steel Industries.

LESS than 150 years ago a small detachment of British and Colonial troops worked their way through the dense forests lining the banks of the Monongahela River, the objective point of the expedition being a small French fort, one of a series intended to check the westward development of the British Colonies. To-day this small fort, or rather its immediate successor, rescued from destruction and preserved by the munificence of a local archæological society, is hidden away among the back streets of Pittsburg, one of the greatest centres of the iron and steel industry. For many miles along the banks of the river, where the Colonial expedition laboriously cut its way through the woods, is to be found the most extensive collection of cooking ovens, blast furnaces, and rolling mills in the world. It is interesting also to recall the fact that in the year 1786 the modest sum of 300*l.* was lent by the Legislature to a Mr. Humphreys for the purpose of enabling him to make steel "as good as in England." From this small beginning the iron and steel industries of the United States have grown, slowly at first, but with increasing rapidity as years rolled on, until, having passed the records attained in Great Britain, the enormous output of 15,878,354 tons was attained in 1901, while in the following year the total of 17,821,307 tons was reached. Notwithstanding this enormous production of iron and steel, the home demand in the United States is so great that during the last year or two it has been necessary to purchase large quantities of these metals from foreign manufacturers to supply the deficit.

Running Powers on Tramways.

SO FAR, scarcely any attempt has been made to deal with the question of running powers as applied to tramways. In railway practice transference of traffic is a matter of absolute necessity, and, owing to the universal adoption of a standard gauge, is perfectly easy of accomplishment. But until recently the system has been regarded as distinctly inadvisable in tramway working. At the present time, however, there are reasons for believing that municipal and other tramway owners will be compelled to consider the interchange of traffic, either by the transfer of passengers or of vehicles, and the regulation of rates and through fares. There is already a demand on the part of the travelling public for through rates and facilities, without the inconvenience and loss of time attendant upon the duplication of fares or upon a change of cars, and there is no doubt whatever that this demand will increase as time goes by. From the point of view of the tramway owner there are certainly difficulties in the way, but at the same time these ought not to be insuperable, and we are glad to learn that the Tramways and Light Railways Association have already had the question under discussion, and now propose to appoint a representative committee to consider the best method of arriving at a practicable scheme likely to be generally acceptable.

The New East River Bridge, New York.

LAST month the new means of communication between Brooklyn and New York, known as the Williamsburg Bridge, was formally opened. This structure, if not the most handsome, is the largest suspension bridge hitherto erected, and spans the East River between Delancey-street, Manhattan, and South Fifth and South Sixth streets, Brooklyn, having a total length of 7,200 ft. The foundations of the towers are formed by timber and concrete caissons sunk to rock level. Above these solid masonry piers, two for each tower, are carried up to 25ft. above high-water level, and masonry pedestal blocks of granite are laid upon the piers to form footings for the four legs of the towers. The towers themselves consist of four legs strongly braced together, the two towers at each end of the bridge being connected in pairs by transverse trusses and diagonal ties. The tops of the piers rise to an elevation of 335 ft. above the river and 442 ft. above the lowest foundation level. The main span, 1,600 ft. clear, is carried by four 18 in. steel wire cables, extending inshore nearly 600 ft., where they are secured by masonry anchorages. Provision is made for stiffening the floor of the bridge by two continuous lattice girders, 40 ft. in depth, and of great solidity, while at intervals plate girder beams, extending across the floor, are riveted to the trusses. In respect of accommodation for traffic, the Williamsburg Bridge far surpasses any other structure of the kind, the roadway being double-decked, and the total width of thoroughfare amounting to 150 ft. The provision for traffic includes two tracks for elevated cars, four tracks for street railway cars, two 18 ft. roadways, two tracks for bicyclists, and two broad footpaths. The completion of the new bridge will undoubtedly be a great boon to the inhabitants of greater New York.

A Steam Pipe Explosion.

FROM the Board of Trade report recently issued relative to the explosion, in August last, from two cast-iron tee-pieces at the Brompton and Kensington Electric Lighting Station, we gather that water-hammer action was the cause of the accident. The pipe system was provided with drain valves and pipes, but one of these which was thought to be open at the time of the explosion was afterwards found to be shut, and the other was found to be choked. It appears that the open ends of the drain pipes discharged into a hot well, and were out of sight of the attendants. This is a very inadvisable arrangement, as the attendant who regulates the valves is unable to see whether they are acting or not. Similar conditions have frequently existed in previous explosions of similar character, and the point is one worthy of note. Another point of importance in connexion with steam mains is that the fitting of back-pressure valves on steam traps creates conditions favourable to the formation of a partial vacuum and the accumulation of water in the pipes, if steam leaks past the main stop valves. The presence of water at a temperature lower than that of the steam admitted to a pipe is always liable to cause an explosion if the steam is turned on too quickly. Cast-iron fittings are very convenient no doubt, but in our opinion wrought steel should invariably be used for high pressure steam.

The Destruction of Country Houses by Fire.

THERE has been an unusual destruction of important country houses by fire during the present winter. The two latest to be destroyed were Hanley Castle, Worcestershire, and Earls Barton Grange,

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Northamptonshire. Unfortunately these and kindred fires have not only destroyed the buildings, but also valuable artistic and literary contents. The pictures in the country houses of England are priceless; no insurance can compensate for the loss of a fine Reynolds or Gainsborough—they cannot be replaced. It is, therefore, very surprising that the wealthy owners of large country houses do not have better water supply and better means of extinguishing fires at hand. The inmates of Earls Barton Grange were sleeping quietly while the fire was raging, showing the need in large houses for some kind of watchman. To what extent modern systems of heating and lighting are responsible for country house fires it is impossible to say without a careful investigation of the facts of each case, but there can be little doubt that improvements are frequently made in these respects in old houses without sufficient regard to the character of the building. On the other hand, many serious fires are the results of small causes produced by the want of care of the inmates. In large country houses a responsible person should make an inspection of the house at midnight, and insurance companies should have the heating and lighting apparatus and its surroundings viewed from time to time by a competent official.

Plympton Grammar School.

CONSEQUENT upon the disestablishment of the Grammar School at Plympton St. Maurice, in Devonshire, the buildings, which present an uncommon example of seventeenth century architecture after the Gothic manner, will soon be vacated, and some apprehension is felt that the site will be cleared. The main portion of the fabric stands upon an open colonnade, having a flat ceiling; the outer walls are constructed of granite and limestone laid in courses. A sum of 2,000*l.* was expended upon a general repair thirty-three years ago. The adjacent parsonage house, the birthplace of Sir Joshua Reynolds, has been demolished. A proposal is made to save the present buildings from the same fate by converting them for the purposes of a local library and reading-room. The Grammar School was founded and endowed in 1658-60 by Elizeus Hele; Sir John Maynard, a trustee of the Hele Charity estate, built the schoolhouse in 1664. It was there that Sir Joshua, whose father, the Reverend Samuel Reynolds, was headmaster, received his education. Amongst other distinguished pupils were Sir Charles Lock Eastlake, P.R.A., who afterwards went to Charterhouse; James Northcote, R.A., and Benjamin Robert Haydon; all townsmen of Plymouth.

Landscape Exhibition, Dudley Gallery.

ONCE more the interesting exhibition of six associated landscape painters comes round at the Dudley Gallery; an exhibition which serves, among other things, to illustrate the important influence of personal style and temperament on the artistic interpretation of Nature. As we go from one set of pictures to another—from Mr. Allan to Sir E. Waterlow, and from him to Mr. Peppercorn—we seem to be in different worlds, and those who think landscape painting is the imitation of Nature might have their eyes opened in this small gallery with its fifty-one pictures. Mr. Allan's works do not represent his usual style; his largest picture, "Far Among the Hills," is a rather melancholy landscape in which the successive ranges of hills have a fine effect of air and distance. He shows us, too, Siena, a pearly-grey silhouette that crowns a hill, and "The Arrival of the Fishing Fleet" at a northern port, a fine coast picture. With Sir E. Waterlow we are in a land of comparatively warm colour, and meet with a style which, though still broad, is more imitative than Mr. Allan's. The "Gorge d'Aprémont, Fontainebleau," is a little ragged in composition; the finest of the set is "A Suffolk Common." Mr. Peppercorn is a painter of half-seen landscape, as in his largest and best work, "Twilight," a kind of landscape art which strikes one as rather easy, and in some of his smaller paintings there is a roughness and absence of intelligible definition which amounts to an affectation. Mr. Aumonier has ten pictures, of which "On the Fell Side" is the best; his largest work, "A Ford on the Chelmer," approaches a little nearer to the commonplaces of landscape painting than the smaller pictures. With Mr. Mark Fisher's collection we are in a world of glittering lights and spots of colour; his largest picture, "An Essex Height," shows a splendid sky. Perhaps his very marked style interposes a little too much of the artist's personality between us and Nature, though it is always intellectually interesting; and "By the Pond" shows that a style suitable for the treatment of foliage and meadow and pond is not so suitable to the treatment of the nude figure. Mr. Leslie Thomson's works are more in the *juste milieu*, and are not the most powerful, though to many they would be the most pleasing, and his view of "Lindisfarne," with the river shimmering in the flat landscape and the wide expanse of sky above, is a real picture.

Water-colours by Thomas Collier.

THE collection of nearly a hundred water-colour drawings by the late Thomas Collier at the Leicester Galleries forms one of the most interesting and satisfactory exhibitions now open. Collier, who died twelve years ago, at the comparatively early age of fifty-one, was one of the best representatives of that broad and genuine school of water-colour art of which David Cox was the acknowledged head; but it may be doubted whether Collier, especially considering the comparative limits of his artistic life, was not fully as gifted an artist as Cox; he was at all events quite as true and sound in his method and his aims. He knew that his medium was essentially one for broad washes and not for niggling bits of detail; and, as Mr. Wedmore says in his excellent critical preface to the catalogue, "he painted not so much places as the spirit of places; and not so much the spirit of the place as the mood of the particular hour. He painted Weather." And all his landscapes are filled with this spirit of open-air breadth and freshness. He did not require a scene of special beauty or picturesqueness to produce a striking picture; an open heath and an open sky were enough for him; witness such works in this collection as "Cannock Chase" (35), "On the Sussex Downs" (38), "A Heath Scene" (46), and, finest of all, "A Sussex Common" (48). These are among the examples in which he made a fine picture out of the simplest materials; but he was equally fine and broad in style in treating such exceptional scenes as "Arundel Park" (33), and "Bamborough Castle" (80). On one of the walls in the room is a row of small sketches—75, 78, 81, 84, etc.—in each of which the sky is quite a study. It was a happy thought to collect together so many of the works of one who, though working mostly on a small scale, was a great landscape artist; and all who are interested in the best school of English water-colour art should pay a visit to the gallery.

MAGAZINES AND REVIEWS.

THE *Burlington Magazine* contains an article on Cotman which deals especially with his paintings of subjects in which buildings form the prominent material of the picture; we can hardly call them "architectural" subjects in the usual sense of the word, as they deal mainly with old and dilapidated buildings which are rather picturesque than architectural. His "South Gate, Yarmouth," which is in the collection of Mr. Arthur Samuel, is a masterpiece in its way, with which we were not previously acquainted; the broad treatment of light and shadow in it is remarkable. Two other examples are given: a sketch of "Buildings by a River," in the possession of Mr. W. B. Patterson, and "An Old House at St. Albans," in the possession of the Fine Art Society. These, though less important subjects, are equally fine in their way, and are reproduced in very fine plates. This is a side of Cotman's work which is less familiar than his landscapes and marine pictures, and we are very glad to have it so well illustrated. The article, written by Mr. J. C. Holmes, is occupied partly with the question of the authenticity of some of the works attributed to Cotman, and with observations on the characteristics of his style and technique which should be looked for as a test of the genuine character of the work. Generally speaking, Cotman is one of the most unmistakable of painters, so strongly individual is his style; but it would appear that he has not escaped the devices of the imitator. Among the other articles in the number is the first part of an article by Mrs. F. Nevill Jackson on "Ecclesiastical Lace, Ancient and Modern," accompanied by some splendidly executed illustrations. The most important critical article in the number is that by Mr. W. H. James Weale—"Popular Opinions Concerning the Van Eycks Examined"; an attempt to arrive at true conclusions in regard to the right attribution of various works to the two brothers or to their followers and imitators; but we have not space to follow out the argument here.

The *Art Journal*, which has come out in a new green and red cover of the *art nouveau* type—not an improvement on its former outside—devotes an article to the works of Mr. John Lavery, whose paintings, from their broad style, come out very effectively in black and white reproduction. In an article on "A Roundel by Pietro Torrigiano," Mr. Claude Phillips gives at length the reasons for his attribution to Torrigiano of a medallion head of Christ in a circular decorative frame, which is in the Wallace collection, and suggests that this may have been the crowning detail of one of the mural tombs planned and partly carved out by Torrigiano during his stay in England. The position and the character of the head of Christ, in the tomb by Torrigiano now in the Record Office, of which an illustration is given, certainly lend a great deal of probability to this suggestion. Mr. Rimbault Dibdin contributes the first of a series of articles on "The Art Annals of Liverpool," which are of more importance and significance than is generally known. The first article is chiefly devoted to the work of that powerful

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though rather sensational animal painter, G. Stubbs, a very remarkable artist in his way.

In the *Magazine of Art* Mr. Aylmer Vallance, in continuing the subject of "Furnishing and Decoration of the House," deals with the treatment of the drawing-room. He is satirical, and not without some reason, in regard to the elegant rubbish (or what is supposed to be elegant) which ladies are fond of strewing about this room which is more especially their province; though this evil, it must be added, is not so widespread and pervading as it used to be. The prejudice against admitting oil-paintings into a drawing-room, which the author thinks not entirely unreasonable, depends entirely on the kind of drawing-room. If the room is one which is furnished and decorated in light colours and with a predominating character of grace rather than sobriety in the furniture, oil-paintings are out of place in it; they are too deep and strong in colour for their surroundings. It is not to be assumed, however, that this kind of gay and bright treatment is the only one suitable for a drawing-room. There are many ways of treating a drawing-room, from the light fantastic style to the severe and subdued style; which is right for any particular house will depend a good deal on the character of the house itself; one might even add, on the character of the inmates. The drawing-room is especially the setting for the lady of the house. A young married lady with a love of society will not unnaturally like a bright and gay character in the room which is her reception-room, and will herself look best in such a room (a very important consideration!); a more mature lady with a taste for art or literature will naturally not wish for the setting suitable to the "social butterfly," nor will she seem at home in it. Nor should the lady of severer tastes despise the social butterfly and her pretty though perhaps rather flimsy drawing-room surroundings; she represents one form of life. What is always to be remembered, however, is that, taking the house as a whole, the drawing-room should be in a lighter key and less severe in style than the dining-room. It is the room of recreation and enjoyment, and should express that character, in a comparative sense at all events. A drawing-room decoration which is light enough in character for one house might appear too grave in another house of which the general character is different. Something depends, for instance, on the staircase; where the drawing-room, as in most town houses, is upstairs. If we approach by a staircase winding in a graceful curve, as in so many London houses of the Adam date, we expect it to lead to a room where grace is the prevailing note. If we ascend a wide and rather monumental staircase laid out on severe rectangular lines, a proportionate degree of severity in the decoration of the drawing-room will not surprise us. Mr. Vallance seems practically to admit a very wide range in the treatment of the drawing-room, to judge from his selection of illustrations; one of which, the lower one, page 113, designed by Mr. G. M. Ellwood, does not strike us as being like a drawing-room at all; it is too sombre in effect and too rigid in line. A drawing-room, whatever else it is, should never be sombre; that character is only fitted for the dining-room. The room by Mr. G. Logan, page 115, is also too sombre in effect; it may be partly the exaggeration of the photograph, but we do not think dark wood wainscotting suitable for a drawing-room. Of the brighter schemes given, none, we admit, are in quite as good taste as to style of detail as these two, with the exception of the drawing-room in the Adam style (page 116), executed by Messrs. Gill and Reigate. That has precisely the character of a drawing-room—bright, cheerful, and graceful, and in perfectly good and restrained taste. The rest of the examples we do not care much for, and the one said to be in the "modern" style, designed, we regret to see, by an architect, is simply detestable; one could not live in such a room. Under the heading "Modern British Etchers" a member of the Society of Painter-Etchers writes a rhapsody on the etchings of Mr. Frank Brangwyn, which are very fine and original, but the writer would have done better justice to his subject by being less ecstatic and exaggerated in his eulogies, which are calculated to arouse a spirit of contradiction in the reader, and we should think could hardly be very pleasing to the subject of them. However, some artists will digest a great deal of praise. Among other interesting articles in the number is one on "Bohemia—A New Country for the Artist," by Mr. Val Prinsep—the literal Bohemia, that is, not the figurative one with which artists are supposed to be so especially familiar; and one on the decorative work of Professor Gerald Moira, which well deserves recognition, but here again we find that tendency to adulation which is the besetting sin of critics in writing about their favourite artists. Professor Herkomer continues his interesting and instructive essay on "How Portraits are Painted." He devotes a good deal of space in this issue to the question how far photography is of any use as an assistance to the portrait-painter, and the caution which should be exercised in making use of it. This essay is full of interest to the general reader, besides containing valuable suggestions for young painters who have their experience to gain.

The *Berliner Architektur-Welt* contains a series of very interesting competition designs for an erection on a canal lock at Machnower, which we take to be, from the drawings, a mill beside the lock, driven by the sluice water. The first premiated design, by Herr F. Lahrs, of Charlottenburg, is shown in a pretty chromo-lithograph illustration which forms the frontis-piece to the number. It shows a long, irregular, mill-like building with high roofs, connected at one end with an annexe which stretches across the canal at right angles to the main building, with a lofty arch where the canal runs under it; on the right is a kind of tower formed of plain masses of masonry, between which the canal runs, and which carry a timber gallery or shed at the top. As an example of the picturesque of homely construction it is admirable; and some of the other designs illustrated are very picturesque. We understand that the locks and weirs on the Berlin canal system are being reconstructed and the buildings connected with them architecturally treated; and if they are all done as well as this the result will be very satisfactory. Among the other contents of the number are a large apartment-house in the Ludwig-kirchplatz, Wilmersdorf (Berlin), by Herr Cartobius, of effective though rather restless design; a terrible piece of confectionery in the shape of an apartment-house in the Lindenstrasse; a sculptured fountain on the Lützowplatz, apparently symbolising the labours of Hercules, with a good deal of "robustious" vigour about it; various sketches of interior decoration, and a dreadful kind of ornamental area-railing, the stone curb rising up in curves which are followed by the iron-work. It is calculated to frighten away burglars of æsthetic taste, at all events.

In the *Monthly Review* there is a very interesting article by Mr. John Ward, F.S.A., giving an account, from personal inspection, of the work which has been going on for three or four years back, under the direction of Mr. Legrain, in ensuring against further destruction the columns of the Hypostyle Hall at Karnac. In the case of a good many of the columns, an entirely new artificial foundation of steel and concrete has been formed, giving them a firm base which will not be disintegrated by the Nile water. We are told that the bed of the Nile, in consequence of the immense amount of deposit from its waters, has been gradually elevated some 20 ft. above what it was when the temples were founded; hence the periodical flooding of the bases of the columns at high Nile which has wrought such mischief. It is satisfactory to learn that such careful measures are being taken, under English rule, to preserve this great architectural monument.

In the *National Review* Sir Henry Le Marchant, Director of the London and India Docks Company, writes a long article on "The Port of London Bill," which deals almost exclusively, however, with the administrative side of the question. The real point of the article is that, as far as public interests are concerned, the Port of London will be better and more economically worked by the existing Dock Companies in regard to docking work, retaining the Thames Conservancy, with an amended constitution, to preside over the business of deepening and maintaining the channels, governing and regulating the navigation, removing wrecks, etc. In fact, he wishes that, as near as possible, the *status quo* should be maintained. The further advantages promised are summed up as follows:

"It is generally acknowledged that under whatever control the docks may be, a larger income is needed to provide for the future requirements of the port and the deepening of the river.

Our proposal, therefore, is that all goods entering the port (except coal, coastwise goods, and transhipment goods) should, as at all other ports except Hull, pay dues for the accommodation they receive. The dues on goods discharged in the river should be paid to the river authority, thus giving them the funds for deepening and maintaining the river. The dues on goods discharged in the docks should be paid to the Dock Companies interested. In return for the increase of income, the London and India Docks Company would be prepared—

(1) To spend at once the sum of 2,000,000*l.* on new dock works.

(2) To limit their dividends on the capital stocks to 4 per cent. per annum. (They paid this dividend in 1902.)

(3) To consent to the reduction of the dues on shipping from 1s. 6d. to 1s. per ton, thereby giving up some 110,000*l.* a year.

(4) To consent to the Board of Trade having power to compel the Dock Companies to carry out necessary dock improvements or to veto any improvements they do not approve of.

(5) To consent to the Railway Commissioners being the judges as to the reasonableness of dock charges other than those authorised by statute."

The all-important question, however, of the maintenance of the channel, is not much considered in the article. It is for this more than anything else that a strong central authority is required, with adequate engineering advice and powers of action. If the access to the Port of London becomes silted up, as has been the case with more than one great port in past history, administrative regulations will be only waste paper.

The *Century* contains an article by Mme. Curie on "Radium and Radio-activity." This is going to the fountain-head, and the article by the principal discoverer or developer of radium will, no doubt, be largely read, though all that it has to tell scientific men is already known. It is accompanied by a more popular illustrated article on the same subject by Mr. Ernest Merritt, Professor of Physics in Cornell University. The frontispiece to the number is an engraving by Mr. Timothy Cole of Murillo's "St. Joseph and the Infant Jesus," a perfectly beautiful piece of manipulation of the texture of wood engraving. We may also direct attention to an illustrated article on "An American Palace of Art." This house, of which we now hear for the first time, is Fenway Court, standing on a drive called the Fenway, outside Boston the region apparently, as its name implies, being reclaimed fen land. The house was built by an American millionairess (if one may use the word), Mrs. Gardner, to be a home for her art collections and itself an artistic palace; we gather that it is now practically open to the public, with little restriction, as a privately collected art-museum. The house seems rather an architectural *mélange*; we are informed that the owner was her own architect, and one knows pretty well what that means; but the house seems to be a treasury of works of art imported from Europe, including an ancient Roman pavement which occupies what in America is called the "center" of the court round which the house is built. We should have preferred a more balanced and homogeneous piece of architecture as the setting for an art collection, but the Boston people seem exceedingly delighted with it, to judge by Mr. Sylvester Baxter's article, in which "serene beauty" and "supreme joy" and other ecstatic expressions abound.

Scribner contains an article by Mr. M. H. Spielmann on the work of Mr. Brangwyn, whom art critics seem to vie with each other in extolling at present. He is a remarkable artist, but we confess that we have not yet succeeded in seeing quite so much in his pictures as it is becoming the fashion to see. Power of colour and originality of design there generally is, but surely rather a lack of beauty. But then mere beauty counts for so little in art nowadays! Under "The Field of Art" a quintet of five writers join in a kind of symposium over an artist named Alfred Quinton Collins, whose fame has not, we think, crossed the Atlantic as yet. To judge from the expressions used, "Alfred Q. Collins" must have been an apostle specially sent into the world to enlighten the human race on the subject of art. We are told that his ideas on the study and practice of painting "are of the utmost importance to the world. . . He believed that the expression of an idea in art is a science which can be taught by one person to another as definitely as any purely scientific study. . . . Early in his career Collins set himself the task of finding out the laws that govern the practice of painting (including the laws of optics), of formulating them, and then putting them in logical sequence so as to develop a set process." It seems difficult to credit one's eyes in reading such remarks. Are the people who write them serious in imagining that any great art was ever produced in this analytic fashion? It is like going back a half-century in American criticism, when we were told that some American composer, whose name is now forgotten, was intending to produce symphonies

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far exceeding those of Beethoven, because they would be based on the influence of the gigantic scenery of his native country. It is really extraordinary that American critics cannot perceive how absurd this spread-eagle kind of writing is in the eyes of sober people.

The *Antiquary* includes an important article by the Rev. J. B. McGovern on "The Chi-Rho Monogram," tracing this symbol from its Pagan origin to its adapted use as a Christian symbol.

We regret to learn that *Knowledge* disappears, after this month's number, as a separate publication. It is to be incorporated with the *Illustrated Scientific News*. The first number of the newly-incorporated journal will take the place of the February issues of each magazine; in size and shape it will follow *Knowledge*, but its contents will comprise the main features of both journals. The present and last issue of *Knowledge* contains an article by Miss Clerke on "World-building out of Meteorites" (No. vi. of "Modern Cosmogonies"); but, in spite of its title, the article seems rather to tend to the conclusion that out of meteorite swarms nothing is or can be made. "Jupiter and his Surface Currents" is the subject of an article by the Rev. T. E. R. Philips, accompanied by a sheet of fine illustrations of recent aspects of the great planet. Mr. Philips upholds the theory that the whole globe of Jupiter is still in an intensely heated semi-molten condition, and concludes, "in the constant agitation of his heated globe we catch a glimpse, though on a giant scale, of our own world in the dim recesses of the past."

The *Gentleman's Magazine* contains an article by Mr. Cuthbert Hadden, half literary, half historic, on "The Curfew Bell," which may interest those to whom old customs are dear. The manner in which this originally merely practical institution has survived in many English villages for nearly a thousand years, and is now kept up for purely sentimental reasons, is a curious instance of the spirit with which, amid all the stir of modern life, we cling to relics of the ways of ancient England.

A NORTH BORDER TOWN:

By an Inhabitant of it.

When anything is lost in our town we send the crier round to tell all the inhabitants, and offer a reward to anyone who may find the missing article and restore it to the owner. Also, when there is a sale of furniture, or a large supply of rabbits, or a lecture, the crier is sent round with announcements of the fact. It is the business of this functionary, moreover, to ring the town hall bell at six in the morning and again at eight in the evening. This prevents any mistake in the time by reason of diversities in clocks; and the eight o'clock bell has the interest of being a survivor of the curfew.

When any of us wish for a conveyance for the purpose of arriving comfortably at a ball or party or place of entertainment, we send for the omnibus, for we have no cabs nor cabstands. Up it comes to our doors, and we sit in solitary state in the cumbrous vehicle, and arrive at our destination in due course, a double fare being charged for the accommodation after a reasonable hour (which sometimes happens to be nine o'clock).

Fishwives come to our doors, too, with creels of fish, either on their backs or under their arms. One of them remarked a few mornings ago that a codling she was offering for sale was nearly as big as a "hippo-taymous." In the season herrings are hawked about the town by men in carts, who call out with loud and strident voices "live and loupin'."

Some of the mothers among us, by way of threatening to box their children's ears, declare they will "skelp their lugs"; and, instead of the scriptural rod, they use "taws" for thrashing their youngsters, which implement is a leather strap cut into a fringe at one end.

People do not take walks in our town, they "get a walk"; and they do not play, but "get themselves played." If they take in a magazine they say they "take it out." If the kettle is upset, it is "cowped"; and if the down-draught of a chimney is disagreeable, or there is borrowed smoke, those inconvenienced by it say they are "scumfished." We are in the same confusion as to the use of "will" and "shall" as they are across the border. When a book entertains us very much we say it is "ridiculous."

What is generally known as "next Monday," or "next Tuesday," we know as "Monday first" or "Tuesday first." Next Monday or Tuesday with us is the one that comes round after Monday or Tuesday first. A south-country family recently hired apartments for a next Monday, and duly arrived with luggage, children, and maids. The landlady confronted the large party at the door with a look of horror. "You've made a mistake in the day," she cried, "the other lodgers are still here." The arrivals explained they had arranged to come next Monday and this was the next Monday. "Oh, no!" she declared, "this is Monday first; next Monday will not be here for a week; and every room is occupied."

We sell our ale by the gill, which is the same as half a pint. You can have one gill, or two gills, or three gills. Pins are usually sold at the grocers' and ironmongers' shops, though drapers are now beginning to keep them "in stock." On market-days the usual concourse of cattle and sheep is occasionally diversified with a flock of goats or a number of donkeys, and still more rarely a large white company of geese waddles in. On the west side of the market-place is the town hall, furnished with a clock tower, finished by five pennon vanes. One of the inns close by has a mounting block on the pavement by the doorway for the use of equestrians, and behind it are rows of stables belonging to the days when accommodation was required for strings of packhorses. Our assembly-rooms are in the market-place, too, over a double row of back-to-back butchers' shops, with an arcaded covered walk on both sides.

We have a good deal of what the Japanese call "social glue." We stand by each other very well; laughing at little foibles, and overlooking the consequences of an extra "gill" in silence or at the most with a shake of the head. We shut up our shops several times in the course of the year, as well as at Christmas, the New Year, and Good Friday. On Easter Monday, for instance, the shops are closed all day. The children betake themselves to a wide pasture down by the river's edge with as many dyed and hard-boiled eggs as they can get, or have been given to them, and play about—tossing and bowling them till they are broken, when they eat them and leave their shells of many colours on the grass as a feast for the crows. The shops are also shut on the afternoon of Easter Tuesday, when the servant lasses and other grown-up young people also resort to the same pasture or meadow, and take part in various games till nightfall, when, hand-in-hand and singing "Auld Lang Syne," they return to the town. On Shrove Tuesday the shops are closed in the afternoon, and many of the inhabitants proceed to the pasture above-mentioned, either to be spectators of a football game or to take part in it. This is played between the bachelors and married men, or between residents in the two parishes into which the town is divided. Then we have a September holiday, as well as the general Bank holiday.

We have several kinds of fairs—March and November fairs for hiring "hinds and herds"; one in May, and another in November for single servants; two for horses and cattle, and a lamb and wool fair in July, when our streets are blocked with country folks and the market-place is full of swings, stalls, merry-go-rounds, shooting galleries, and exhibitions of various kinds, accompanied by powerful music. Our July fair is still ceremoniously observed as in the days of yore, when the Scots had to be taken into account. We have an annual flower show, too, and an occasional agricultural show; and on all these days the town is filled with crowds of happy, hearty, well-behaved, and well-dressed people from neighbouring villages. Every Saturday most of these villages still send carriers' carts to the town to bring consignments and take away requisites.

As the old order changes every day, it may be added to these notes that we have our "self-help" men, geologists and botanists, our Hans Sachs, our clever workers in iron and other metals, our artist who paints our wild cattle on their misty hills with appealing truthfulness, another clever at portraits, and a considerable amount of local talent of various other kinds; but we excel most, as becomes a border population and the influence of heredity, in the skill of our volunteers. Time after time our young men have brought back prizes (from Wimbledon, Shoeburyness, and elsewhere), and one of their officers now holds a champion cup as large as the tea urns the poet laureate has mentioned to us. Our bee-keepers, too, carry off many prizes from distant shows for the honey garnered on our breezy moors.

We have an ancient church, with a beacon turret at one end and a massive fifteenth-century tower at the other, and a modern church for a portion of the town made into a new parish; and we have chapels for nearly every denomination of dissent, including barracks for the Salvation Army. Four hundred years ago our town was walled round with a great stone wall. This is now removed, all but two of its gateways, which contribute to the border characteristics. And close by, looking down upon "the modern" with supreme indifference, stands the grand castle that was formerly the great strength of this part of the country, and was all in all to the kings, knights, squires, dames, servitors, troubadours, and jongleurs who passed in and out of its cavernous archways in the days of yore.

S. W.

WATER SUPPLY SYSTEM AT SALISBURY HOUSE.

Occupying an extensive site in Finsbury, with frontages on Moorgate-street, London-wall, and Finsbury-circus, Salisbury House is one of the largest office buildings hitherto erected in the metropolis. When originally completed the building was furnished with water from the mains of the New River Company, but, as usual in the case of large office and warehouse buildings in the city, it was found that the charges of the water company were very far in excess of the actual value of the water used. Even at the reduced rate the water company were receiving about 800*l.* per annum, which, in view of the comparatively small amount of water used, was considered by the proprietors of the building to be an unjustifiable expense. Consequently inquiry was made as to the possibility of procuring water from some independent source, with the result that the building is now supplied from two artesian wells at a cost which it is estimated will not exceed one-half the amount previously paid to the water company.

The installation is in duplicate, and consists of two artesian wells, specially-designed borehole pumps driven by electric motors, electrically driven circulating pumps, two large storage tanks on the roof of the building, and the necessary pipes in connection therewith. The boreholes are of 7¼ in. internal diameter, lined with steel tubes connected with screwed steel sockets, and are sunk from the floor of the pump-room to a total depth of 450 ft., passing through the strata shown in the subjoined table.

Strata encountered in Sinking Wells at Salisbury House.

	Ft.
Grey ballast	3
Dark grey clay	36
Dark grey clay and stones	24
Grey sand and mottled clay	2
Dark grey clay	47
Mottled clay	31
Mottled clay and hard pebbles	3
Green sand and pebbles	17
Hard grey sand	11
Live grey sand	28
Black pebbles	2
Chalk and flints	246
Total	450

The normal water level is at present situated 140 ft. below the floor of the pump-room, and the pumps are fixed at a depth of 240 ft., being submerged 100 ft. below the level of the water.

It is well known that the permanent water levels in the London basin have been falling steadily for many years past, owing to modern systems of drainage and the extensive pumping operations of various water companies and the owners of private wells. In places where 100 years ago the water when tapped would rise to the surface and overflow, the level is now fully 100 ft. below ordnance datum. In the year 1850 the permanent levels were depressed from 50 ft. and 60 ft., and, at that time, the level was falling at the rate of 1 ft. per annum. In 1893 the fall was variously estimated at between 12 in. and 18 in. per annum, and it is quite certain that the depression is not less than 1 ft. per annum at the present time. In view of these facts, it will be seen that the engineers responsible for the installation at Salisbury House have acted wisely in carrying the boreholes to a considerably greater depth than that demanded by existing requirements, and in placing the pumps at such a depth that it will not be necessary to alter their position for many years to come, if at all. In fact, the plant is designed so that it may be in every way serviceable for the next century at least.

Below the valve of each borehole pump 30 ft. of 4 in. suction pipe is provided. The pump

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buckets and plungers are 5¾ in. diameter, and the rising mains above the gunmetal pump barrels are of 6 in. diameter steel tube. The plunger rods between the pumps in the tubes and the connecting rods attached to the mechanism above ground are of steel, 1¼ in. diameter, provided at suitable intervals with gunmetal guides secured by means of back nuts. The crossheads work in the guides of cast-iron hanging frames, secured to the under side of a steel girder extending from wall to wall of the pump-room. Above the latter are fixed two sets of mechanism for driving the pumps, each consisting of a frame carrying a disc crank and worm gear. The cranks are carefully balanced, and are actuated, through the worm gear, from direct-coupled 18-h.p. continuous-current motors running at about 850 revolutions per minute. The gears are provided with double-threaded machine-cut worms, 1¼ in. pitch, with a speed reduction of thirty-eight to one, so that the pumps run at about twenty-two revolutions per minute.

The delivery pipes from the main pumps are of 4 in. internal diameter, being coupled together and connected with the rising main proceeding to the storage tanks at the top of the building. Each pump is capable of delivering 3,000 gallons per hour, and, as the combined capacity of the tanks is 30,000 gallons, they could be filled by either of the two pumps in about ten hours. In practice, however, the tanks are never entirely emptied, and it is found that pumping from four to five hours daily is sufficient for all the requirements of the building. The storage tanks are of cast iron, and are situated at a height of 100 ft. above the pump-room level, so that an ample head of water is maintained in the service main and branches to the various draw-off taps. The two tanks are coupled by means of piping, so as to virtually form one tank, and we may add that an alternative connexion is maintained with the mains of the New River Company for use in case of emergency. An overflow pipe is provided for each tank, and the two overflow pipes are joined into one main carried down to a low-level tank in the pump-room.

The circulating pumps previously mentioned are also in duplicate, and are of the three-throw type, with 5 in. diameter plungers, driven by direct-coupled 5-h.p. continuous-current motors running at 1,000 revolutions per minute. The whole of the pump gear is machine-cut and fitted with rawhide pinions for the purpose of insuring silent working, and, as the speed reduction is twenty-six to one, the circulating pumps run at nearly forty revolutions per minute. These pumps run very smoothly, and appear to be well designed in every respect, the discharge of each being 3,000 gallons per hour. The pumps can be used for returning any overflow water to the high-level tanks, and, as the water is delivered through a separate rising main, the pumps can be employed for circulating the entire body of water in the main storage tanks, if required, for the purpose of avoiding stagnation.

A complete and conveniently-arranged switch-board, with all the instruments necessary for control of the plant, is erected between the two main pumps in the pump-room, and the current used is obtained from the mains of the City of London Electric Company at a pressure of 400 volts. The entire installation was designed and carried out by Messrs. Alfred Williams and Co., of Bow, and we learn from the director of Salisbury House that the plant has in every way fulfilled his expectations.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The fifth general meeting (business) of the Royal Institute of British Architects for the present session was held on Monday at No. 9, Conduit-street, Regent-street, Mr. Aston Webb, R.A., President, in the chair. Seventy-four Fellows (including twenty-five members of the Council), eighty-two Associates (including three members of the Council), and two Hon. Associates, were present.

Mr. Alex. Graham, the Hon. Secretary, announced the decease of William Pain, elected Associate 1869, Fellow 1875, and Walter Simpson McClelland, formerly of Jannagar, Bombay, elected Fellow 1891. It was resolved that a message of condolence be sent to the families of the deceased members.

The Hon. Secretary announced the receipt of books presented to the library, and a vote of thanks was passed to the donors.

The following candidates for membership were elected by show of hands under By-law 9: As Fellows: Messrs. P. Morley Horder; A. Paul MacAlister, Cambridge; T. Ridley Milburn, Sunderland; W. Milburn, Sunderland, and A. E. Perkins. As Honorary Associate: Mr. F. Bernard Dicksee, R.A. As Hon. Corresponding Member: Le Comte Robert De Lasteyrie, Member of the Institut de France.

Notices being on the agenda from Messrs. G. A. T. Middleton, Butler Wilson, President of the Leeds and Yorkshire Architectural Society; J. W. Beaumont, President of the Manchester Society of Architects; John Woolfall, President of the Liverpool Architectural Society; Edgar G. C. Down, on behalf of the Cardiff, South Wales, and Monmouthshire Architects' Society; and Herbert Davis, on behalf of the York Architectural Society, that they would bring forward the following motions at the meeting—viz.

1. That this Institute is in favour of the general principle of the compulsory examination and registration of architects;
2. That a Committee be appointed to consider what steps should be taken to give effect to this principle, and to report thereon to a Special General Meeting before the opening of Parliament;
3. To nominate this Committee.

Mr. G. A. T. Middleton formally moved the first resolution as above, and Mr. Butler Wilson moved the following as an amendment—viz.: "That a committee, consisting of the Council of the Royal Institute of British Architects and representatives of the Allied Societies, be appointed to consider what steps should be taken to give effect to the principle of registration, and to report thereon to a special general meeting." The amendment was seconded by Mr. G. C. Ashlin, R.H.A., President of the Royal Institute of the Architects of Ireland, and supported by Mr. J. W. Beaumont.

An amendment, moved by Mr. J. Macvicar Anderson, Past President, and seconded by Mr. Henry T. Hare, that the following words be omitted from Mr. Butler Wilson's amendment—viz.: "what steps should be taken to give effect to"—was agreed to by Mr. Butler Wilson. Whereupon, Mr. Macvicar Anderson's amendment having been put from the chair as the substantive motion, it was

RESOLVED, against one dissentient, That a committee, consisting of the Council of the Royal Institute of British Architects and representatives of the Allied Societies, be appointed to consider the principle of registration, and to report thereon to a Special General Meeting.

The proceedings then closed, and the meeting separated at 9 p.m.

Books.

The Law of Compensation. By J. H. BALFOUR BROWNE, K.C., and CHARLES E. ALLAN, Barrister. Second Edition. London: Butterworth and Co. and Shaw and Co. 1903.

THE name of the principal author of the work is a guarantee that it is sure to be trustworthy. It is, in fact, a complete repertory of the law on the subject of compensation, containing also a large number of useful forms. Compensation, though it changes in its application, actually increases. Railways do not take property to the large extent they did, but municipal enterprise has taken their place. This edition, consequently, contains the Housing of the Working Classes Acts, 1900 and 1903, and references to some two hundred decisions which were delivered since the first edition was published. The fault of the book is a want of brevity in the text, a fault which needs checking, since it tends to make a necessarily large work more voluminous than it need be. We will quote an instance from p. 129. "*Easements.*—There are, however, one or two points as to the measure of compensation which are not quite clear. . . . Thus, where ancient lights were obscured compensation was allowed both for the loss of light caused thereby and also for the loss caused by obscuring lights which were not ancient by the same works, the court following the principle," etc. It would have been easy to state this proposition both more succinctly and more clearly, for the reader who wishes to know the exact point decided.

Journal of the Sanitary Institute. Vol. XXIV., Part III. London: Sanitary Institute, Margaret-street, W. 1903.

NEARLY the whole of this part consists of papers read at the Bradford Congress of the Institute in the three "sections" of Sanitary Science and Preventive Medicine, Engineering and Architecture, and Physics, Chemistry, and Biology. Dr. A. Rabagliati has an interesting paper on the causes of infectious fevers, and concludes that the chief cause is "over-feeding, even with sound food (still more, of course, if the food is bad); bad air is a contributory cause." Sewage purification is considered in papers by Mr. Douglas Archibald (in favour of preliminary chemical precipitation); Mr. W. Kaye Parry, M.A., M.I.C.E., who maintains that bacterial treatment is not as economical as its advocates would have us believe, and does not get rid of the sludge difficulty; Professor Henry Robinson; Mr. W. D. Scott-Moncrieff, on the "Standardising of Sewage"; Mr. A. G. Leigh, on "Manufacturers and the Rivers Pollution Prevention Acts"; Mr. K. F. Campbell, on the experimental treatment of sewage containing trade waste at Huddersfield; and by Mr. Charles F. Wike, M.Inst.C.E., on experiments in sewage-treatment at Sheffield. Of more particular interest to architects are the two papers by Mr. A. Saxon Snell, F.R.I.B.A., the first dealing with the design and details of construction of a hospital ward, and the second with the influence of planning and construction upon the cost of maintenance and administration of public baths; the latter is illustrated by eight full-page plans. A paper by Mr. W. Noble Twelvetrees, A.M.Inst.C.E., on "Electricity for Small Hospitals," is also an interesting contribution.

Lectures to Plumbers. (Second Series.) By J. WRIGHT CLARKE, Lecturer on Plumbing at the Regent-street Polytechnic. London: B. T. Batsford, 94, High Holborn. 1903.

AS THE title indicates, this book contains a number of lectures on plumbers' work. The lectures were first printed in the *Plumber and Decorator* from 1892 to 1896, and appear to have been issued in the present form without substantial alteration. They are not numbered, and the arrangement leaves something to be desired. The first two lectures are on water-closets and flushing apparatus, and are followed by others on lead coffins and lead bossing. The methods of fixing water-closets are then considered, and after a number of lectures on baths, lavatories, sinks, dairies, household laundries, the physical properties of water, etc., the subject is continued in the final lecture entitled "Positions for Soil-pipes." The author has evidently had a wide practical experience, and his book will be of great service to practical men. Architects will have fewer complaints to make in the future than in the past, if apprentices and journeymen will take Mr. Clarke's lectures to heart. He not only draws attention to the defects commonly found in sanitary apparatus and in the pipes connected therewith, but describes in detail better methods of doing such work, giving many valuable hints by the way. The illustrations—236 in number—add materially to the value of the work, but, unfortunately, we look in vain for illustrations of some of the best modern fittings. Thus, while the concealed standing overflow for baths is shown, the exposed overflow of the same type is neither illustrated nor described. In the lecture on "Wash-hand Basins," reference is made to standing combined waste-and-overflow pipes for baths and wash-handbasins, but the concealed type appears to be intended, and there are no illustrations of any basin overflows, except those of the old-fashioned kind with holes formed in the back of the basin and covered by a shell. It is a pity that the lectures were not brought up to date before being issued in book form.

The Drainage of Town and Country Houses. A Practical Account of Modern Sanitary Arrangements and Fittings. By G. A. T. MIDDLETON, A.R.I.B.A., etc. London: B. T. Batsford, 94, High Holborn. 1903.

THIS little book of about 150 pages appears to have been written to take the place of a book on house drainage published by the same author some years ago, and can be recommended as a useful text book for students. It contains ninety-three illustrations, including six folding plates. The elevation and section of the restaurant on Plate E. do not tally with the description on page 11; anti-siphonage pipes are

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not shown from the basement water-closets, and the lavatory waste-pipe is *not* carried above the roof. The author writes clearly and to the point, but the following sentence on page 23 needs revision: "For house drains the circular section of pipe is almost always used, though a more rapid flow is obtained by using an egg-shaped section, on account of the quicker curve of the invert, for, owing to their shape, the pipes act as a wedge, and in soft or uneven ground cause a break in the line." Chapter XIII., entitled "Disposal Works on a Small Scale for Isolated Country Houses, etc.," is too short and indefinite to be of much service. The author appears to have obtained his information from two firms who are certainly well-known as experts in sewage purification, but whose patented fittings are not the only apparatus suitable for country houses. There is no necessity whatever for a septic tank to be "light-tight," and the statement on page 106 to the effect that the effluent from a septic tank is "infinitely more harmful to human life than before treatment" must be taken with a grain of salt; the author goes on to say that "it should not be passed direct to land or stream in this condition under any circumstances," but on the previous page we are told that the overflow (*i.e.*, effluent) from a cesspool (in which, of course, septic action takes place) may be taken into a sump, "unless there be a stream handy, when it is taken direct to the stream; when there are farms or large kitchen-gardens, however . . . the contents of the cesspool are pumped out and distributed over the land at frequent intervals."

British Standard Sections Issued by the Engineering Standards Committee—Beams. London: Crosby Lockwood and Son. 1903.

WHEN the list of British Standard Sections was issued in February last, the announcement was made by the Engineering Standards Committee that further details would be given at a later date relative to areas of sections in square inches, weights per foot run, moments of inertia, and similar measurements.

The pamphlet to which we now call attention contains the further particulars promised, so far as beams are concerned. It will be remembered that thirty standard sections have already been settled, and for each of these the committee have now given the sectional area, the centre of gravity, the moment of inertia, the radius of gyration, and the moment of resistance. The sizes, thicknesses, and weights per foot are also stated, and at the head of the present list there are two diagrams which make perfectly clear the methods of measurement adopted. The pamphlet is conveniently arranged for reference, and should be of considerable use to all who are concerned in structural steel work.

THE POST OFFICE LONDON DIRECTORY FOR 1904.

THIS indispensable work, which has just been issued by Kelly's Directories, Ltd. (182-184, High Holborn, W.C.), is the 105th annual issue. It has been corrected down to the latest date with the care and accuracy which have characterised previous issues of the Directory. Aldwych and Kingsway have been inserted in the "Streets" section, and also on the excellent linen-backed map which is issued with the work, and exclusive of advertisements, the Directory now contains 3,433 pages, which is an increase of 37 pages over the edition of 1903. In this connection the publishers make an interesting announcement as follows: "The area of the Metropolis as given in the 'Post Office London Directory' has remained practically unchanged for more than fifty years, whilst for a long period the adjoining districts have been given in 'Kelly's Suburban Directory.' The latter was at first issued only every fourth year, then in alternate years, and finally every year. But, as the publishers believe, this plan does not fully meet the wants of the public, and they have therefore decided to include in one volume the whole of the district lying within the boundaries of the County of London, thus adopting an official in the place of a mere arbitrary boundary. The arrangement of the 'Post Office London Directory' will undergo no change of any kind; it will be published in identically the same form and at the same price as hitherto. The arrangement of the abridged Suburban Division as regards the 'Streets,' 'Commercial,' 'Trades,' and 'Private Residents' sections will be the same as that of the 'Post Office London Directory.' . . . For the convenience of those subscribers who do not wish for a volume more bulky than that to which they have been hitherto accustomed, an edition printed on fine paper will be prepared. In this way it is hoped that the addition of about 1,400 pages will be made without appreciably increasing the size of the volume. The work will also be obtainable in two volumes at an extra cost of 3s. 6d. The alteration by which the 'Post Office London Directory' will be offered with the County Suburbs in one single volume will be made next year (in the edition for 1905), but a few copies will be offered for sale on the publication of the next 'Suburban Directory' (in March, 1904)."

TRADE CATALOGUES.

WE have received from the Auto-Balance Door (Parent) Co. a copy of their catalogue of auto-balance doors, windows, gates, etc. The construction of these fittings is decidedly ingenious, and, as it is approximately the same in all cases, a short description of one of the doors will suffice to give a general idea of the invention. The principal feature is the division of the door into two unequal parts along a line parallel to the diagonal but at a short distance from it. The apex of the lower of these is rigidly fixed to one end of the top rail, which is pivoted in the centre. The other is pivoted at the bottom, and has a triangular frame attached to the stile near the heel in the same plane as the door. The apex of this triangular frame and the free end of the top rail are united by two flat iron bars working on pivots at the ends. A handle is fixed on the diagonal stile of the upper leaf of the door, and when this handle is pulled towards the jamb the leaf revolves sideways on its pivot until the edge of the diagonal stile is in a vertical position coinciding with the jamb of the opening. This movement depresses the apex of the triangular frame attached to the leaf, and communicates the motion (by means of the iron bars) to the free end of the top rail; as the top rail is pivoted at the centre, the depression of the free end causes the other end to rise, and thus swings the lower leaf of the door sideways, leaving the whole opening of the doorway clear. The leaves may turn into recesses formed in the partitions in which they are placed, or may be exposed to view. These doors have been used in Belgium for tramcars and railway wagons, as well as for offices and other rooms, and have recently been introduced into this country. It must be confessed that the diagonal lines necessitated by the method of construction detract from the appearance of the doors.

Messrs. Hobbs, Hart, and Co. have sent us their new catalogue of locks and lock-furniture. It is a well-printed volume of about a hundred pages, bound in cloth, and fully illustrated. Among the locks we notice various forms of the patent "Protector" lever lock, which is specially designed to afford protection against picking and fraud. The "Protector treble-action transmutation key locks" have keys with changeable steps, ranging in number up to fifteen; 5,040 transmutations can be made in a key with seven changeable steps, and more than a billion in one with fifteen. The lock is so arranged that by the mere art of locking it takes the form of the key used, to the exclusion of all other forms. Less expensive locks with levers up to five in number are also shown, including mortise, rim, and dead locks. Cupboard and till locks, lock-furniture of metal and wood, finger-plates, padlocks, espagnolette bolts, panic bolts, door-handles, sash-fasteners, and other fittings are illustrated and priced. Architects in search of locks of special or ordinary type will find this catalogue very useful.

From the Farnley Iron Co. (Farnley, Leeds) we have received an excellent catalogue of glazed bricks and sanitary ware made from the Farnley clay. The catalogue is clearly printed on good paper, and contains about fifty coloured plates, illustrating the articles manufactured by the company, in addition to about a dozen pages of letterpress. The first section deals with glazed bricks and tiles, and contains examples of square, shaped, and moulded bricks in great variety, Picking's patent hollow glazed partition bricks, Balaam's patent glazed bricks for the floors and walls of swimming-baths, and Still's patent scum-troughs. The next section includes porcelain baths of various kinds, and is followed by others dealing with lavatories, slop-sinks and hoppers, kitchen and butlers' sinks, wash-tubs, mangers, cattle and pig troughs, &c. Seven plates are occupied by illustrations of stall urinals and floor channels; water-closets and latrines are shown on four plates, and these are followed by four plates containing illustrations of glazed channels for manholes, post-mortem tables, and laboratory tables and sinks. For the prices of the goods the reader is referred to a separate price-list, a copy of which has not been sent to us. Undoubtedly there are certain advantages in a separate price-list, but there are also obvious disadvantages. An architect often wishes to know the prices of goods before specifying them, and if these are not given in one catalogue he will turn to another catalogue where prices are given, and select from this in preference to the other. A separate price-list—even if the architect has received a copy—may be lost or mislaid, and manufacturers who issue such separate lists would, we think, find it to their advantage to provide a pocket in the catalogue for their reception, or some other simple method of securing them.

From the Willesden Paper and Canvas Works we have received a small but interesting catalogue, containing descriptions and prices of their waterproof paper and canvas, and illustrations showing the uses to which they can be put. Among these uses may be mentioned the covering of walls and roofs of light timber buildings, the covering of rafters or roof-boarding under slates and tiles, the insulation of cold storage chambers, tents, awnings, portable baths, canoes, and van-sheets. Directions are given for fixing the materials, and prices of the materials per lineal yard are printed on the last page.

Messrs. J. Sagar and Co., Halifax, send us some special circulars of wood-working machinery. The first item described is a quick-feed machine of large size for planing floor, ceiling, and other boards and planks. The second is a heavy moulding and floor board planing machine, designed for dealing with floor and other boards and for working all kinds of mouldings at a high rate of speed. The other appliances illustrated and described are different varieties of four-cutter and five-cutter planing and moulding machines for hard or soft woods. All the machinery mentioned appears to be of the most solid construction, and to be equipped with all necessary auxiliaries and attachments to provide for satisfactory working and the convenience of users.

Messrs. Waygood and Co. send us a pamphlet relative to various features of their electric lifts, the operating mechanism of which is of entirely British manufacture and fitted with brakes coming into action automatically when the current is shut off from any cause. Some controversy has arisen as to the comparative merits of drum and V sheaves in connexion with the driving of electric lifts, and it may be noted that Messrs. Waygood and Co. very properly favour the adoption of drum driving for all passenger lifts, using V drives for goods lifts only. One objection against drum winding is the possibility of the cables becoming slack under certain contingencies. This, however, is provided against by the adoption of a special automatic switch coming into action and stopping both the motor and the cage if a cable should become slack. Although the point is not emphasised in the present pamphlet, it may be well to mention the fact that all the lifts of this firm are fitted with safety gear.

ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At a meeting of the Council of the Birmingham Architectural Association, held on the 1st inst., it was resolved that a protest be entered against the increasing amount of architectural work carried out by the City Surveyor, believing that it is not in the interest of the ratepayers nor conducive to the best architectural result, when important building work is carried out without the designs and superintendence of a qualified architect, nor fair to the architectural profession, which is well represented in Birmingham, to be repeatedly ignored when public buildings are contemplated by the City Council.

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Correspondence.

THE ABBEY OF ST. VICTOR, PARIS.

SIR,—The late Mr. H. W. Brewer's conjectural restoration, which appeared in your last issue, represents the famous abbey of St. Victor, which was founded shortly after 1108 by Louis le Gros, and is said to have been the cradle of a long list of theologians, philosophers, poets, and commentators whose writings are still preserved in the archives of Paris; amongst others, Maurice de Sully, Bishop of Paris (1160-96), to whom we owe the church of Notre Dame; Hughes, Adam de St. Victor, Pierre le Mangeur, and others. It possessed also treasures of great value and a library, which is said to have been the most important in the kingdom. Portions of the church, including the nave and choir, were rebuilt in the first third of the sixteenth century, as also the dormitory, refectory, and infirmary, but the great town, the crypt, and portions of the Chapter House remained the same as when built by Gilduin, the first abbot. At what period the abbey was destroyed is not known, but on its site was built in 1813-19 the existing Halle-aux-Vins, or, at least, the south-west blocks of the same, and Mr. Brewer would seem to have suggested in the foreground on the left the original buildings, which constituted the docks at Paris, and where the wine had to be sent for the payment of the *octroi* or duty. The south-west wall of the enclosure was flanked by the Rue de St. Victor, the continuation of which now forms the south-west wall of the Jardin des Plantes.

North-west of the abbey were the towers and curtains of the fortified walls built by Philip Augustus and commenced in 1208 on the south side of the Seine by the "Tour de Nesle" opposite the old Louvre. These walls enclosed the hill on the south side of the Seine, on which the Abbey of St. Geneviève was founded by Clovis, and, after passing round the abbey, returned at right angles to the river. About 100 yards to the east of the angle tower was a bridge, the Pont de la Tournelle, of ancient foundation and several times rebuilt, which crossed over to the centre of the Island of St. Louis. It is possible that the nearest and the corner tower may have been known as the Tour de la Tournelle owing to its proximity to the bridge just mentioned. At all events, it would seem to have given Mr. Brewer a name for the picturesque group of towers which is shown on the right of his drawing, but there is no record of any priory in Paris of the name given.

Scarcely anything remains of the Abbey of St. Victor. It is said there are some Gothic windows which may have belonged to the Grange now built up in one of the houses on the south-west side of the Halle-aux-Vins. Of the Rue St. Victor only a small portion retains the name starting from the new Boulevard St. Germain. Close by Notre Dame des Champs, and running as far as the Rue des Fossés St. Bernard (originally the Rue des Fossés St. Victor), there stood the Port St. Victor in Philip Augustus' wall, and portions of the wall still exist in the rear of the houses close by.

R. PHENÉ SPIERS.

*** Our own first impression on studying Mr. Brewer's drawing was that he had intended the turreted line of building on the right for part of the wall of Philip Augustus, which we knew started from the river bank about this point; but it did not seem quite sufficiently of the character of a fortification to justify its certain attribution, in the absence of Mr. Brewer's own explanation of the drawing. The block of building on the extreme right occupies almost exactly the place assigned in Mr. Belloc's plan of late mediæval Paris to the "Palais des Tournelles," which we took, therefore, to be the successor to the "Priory des Tournelles" mentioned in Mr. Brewer's title. We are much indebted to Mr. Spiers for the information which his exceptional knowledge of Paris has enabled him to give.—ED.

PAINTINGS AT THE DUCAL PALACE, VENICE.

SIR,—It may not be generally understood even by those who know their Venice—from personal visits or from their "Ruskin"—that opportunities now exist for examining in detail not only the great picture of Tintoretto which covered the "Wall of the Paradise," as Ruskin calls it—at the east end of the great Council Chamber—but also the wall itself which this picture was painted to cover after the great fire of 1574, and so to note the actual and original "Paradise" painted thereon by Guariento as soon as the building was finished in 1362-5 (according to "The Stones of Venice," Chapter V., "The Ducal Palace.").

Of course the sight of the remains of this original decoration was not possible to the author, and the tradition was that it had "withered before the flames"—but still there are portions of real figure work existing, and indications of pattern work—quite worthy of complete investigation. If an educated artist would devote a little time to the study on the spot (and what more delightful task could be given such a one?), I have no doubt the whole scheme of this original Paradise by Guariento could be made out. Will no one take the hint? As to the Tintoretto, which we have all only seen hitherto—the immensity of it as a picture is peculiarly observable now it is transferred to new canvas, and stands supported by framework in the centre of this grand room, with the light from the windows of the sea front full upon it.

What is going to be done I do not know; but there it is at present, available for close study, and, with the liberality of the present *régime*, is free to be gazed upon by all Venice on Sundays, and for a small fee on other days.

C. F. HAYWARD.

ACTON PUBLIC OFFICES AND TOWN HALL COMPETITION.

SIR,—Having seen the drawings submitted in this competition, I am glad to see that your opinion of the assessor's award, that he has not selected the most suitable design, entirely agrees with the conclusion I came to after a careful examination of the designs. It is remarkable that in a great number of recent competitions the assessor has selected a design which competitors and non-competitors have agreed was not the best one. It is also remarkable to find that the assessor has, in nearly all cases, given undue preference to the plan.

This preference for the plan seems to have been so pronounced of late that it is surprising that elevations are asked for.

Surely it is time that architects or the public protest and ask that those who live outside the buildings should be considered as well as those within. An architect who has made a fine elevation and a plan not far below the best can easily make slight modifications to his scheme when he meets the committee and finds out what they want, and the result will be a fine building; whereas the man who has won the competition solely for his plan, and with an elevation which the assessor does not appear to have looked at, will never make a good elevation however much his committee may desire it.

This is a thing they manage better in France. Paris would not allow its streets to be defaced by buildings exhibiting an utter absence of study, proportion, and refinement, merely because the plan was a good one.

FRANCIS W. BEDFORD.

SIR,—Whilst thanking you for your kind remarks about my design for the above, I should be glad if you will kindly allow me a little space in your next issue to explain that my scheme cannot claim the remarkable point you name with regard to the position of the Councillors' cloak rooms, etc., which are *not* reached through the Council chamber, but *en route* to the approach thereto in common to it in the committee rooms. The lavatories you mention were designed to serve another and obvious purpose.

With regard to the provision of corridors, etc., to the Town Hall, these may be ample, but were not intended so much for architectural effect as for distributing the audience in sections in case of panic. I think this point needs no further argument after the recent terrible object-lesson at Chicago.

C. E. MALLOWS.

LIABILITY OF EMPLOYERS.

SIR,—In your article on Workmen's Compensation in *The Builder* of January 2, you point out that the decisions in the case of "anthrax" contracted during the victim's legitimate employment, may have far-reaching results, and be made to include such illness as "lead-poisoning." This, so far as it affects the building trade, would include only painters. I should like to point out at once, therefore, that the liability of painters to forms of lead-poisoning is a matter entirely within their own control. It is a question of personal cleanliness; and the properly trained painter, who invariably washes his hands before taking food, does not suffer from lead-poisoning. It is the careless or slovenly man who neglects this well-known precaution who so suffers. Lead-poisoning is, for painters, a preventible trouble, and, therefore, in no sense an "accident."

There are, doubtless, here and there, constitutions exceptionally sensitive to the action of lead; but such cases must so soon be obvious to the individuals concerned that they would hardly follow the calling.

J. D. CRACE.

EASTER HOLIDAYS AND THE BUILDING TRADES.

SIR,—Are the Easter holidays a nuisance to the building trades? That is a question which I should very much like to see taken up by your readers. For some years past I have been of opinion that the great majority of employers and employees in the building trades would gladly see the end of the Easter holidays, as far as their trade is concerned.

It is a very different matter with clerks, shopkeepers, factory hands, etc., in fact, all whose employment is constant, to have certain specified days for holiday-making. But is there anything to prevent the busiest man in the trade from taking a holiday almost when he likes? Even in the summer there are slack periods during which almost any man can be spared by his employer, if he wants a holiday. Then there is the "bean-feast." To quite three-fourths of the men there are already too many unavoidable cessations from work. At Easter the builders and decorators are just getting into full swing, when along comes this holiday. Nobody seems to know till a day or two before Good Friday how long the works or the job will be closed. Sometimes some of the men are allowed to work, and not others, even on the same job. As regards the men, I am positive they do not knock off on Good Friday on account of the religious associations of that day. We all know full well that not half the men have the means, if the will, to go holiday making at this period. The weather, too, is always treacherous.

All things considered, I cannot see the good of Easter holidays in the building trades. A good way to ascertain the feeling in the trades would be for about a dozen large firms to take a plebiscite of their men on the question, say, on the first of March.

ARTHUR A. GEE.

BOOKS RECEIVED.

EDUCATIONAL WOODWORK. By A. C. Horth. (Percival Marshall and Co. 3s. 6d.)

FREEHAND LETTERING. By Victor T. Wilson, M.E. (Chapman and Hall.)

DISINFECTION AND THE PRESERVATION OF FOOD. By Samuel Rideal, D.Sc. (The Sanitary Publishing Co.)

Illustrations.

COMPETITION DESIGN FOR STOCKPORT TOWN HALL.

WE give this week illustrations of the design for the Stockport Town Hall by Messrs. Willoughby and Langham, of Manchester, to which the second premium was awarded in the recent competition.

The following extracts from the architects' report sent in with the drawings will explain their intentions in the design:—

Council Chamber.—The keynote of the design is the council chamber (semi-circular on plan), which has been placed exactly in the centre of the site in order to be equally accessible from every point, and be free from street noises. It is situate at the head of the principal staircase and approached both left and right by spacious lobbies. The committee-rooms are in front, *en suite* with the Mayor's parlour, and the town clerk in close proximity. The council chamber is amply lighted by lunettes in the curved ceiling, together with a range of clearstory windows above the chairman's seat.

A gallery to seat ninety persons is provided to the council chamber for the public to hear the debates, having a separate access and staircase. A minstrels' balcony also is shown to the No. 1 committee-room, approached from the second floor corridor; this would be found very convenient when the committee-rooms are being used *en suite* for mayoral banquets, etc. Suitable servery and kitchen over (fitted with cooking range, food lifts, etc.) are also planned in conjunction with the suite of committee-rooms for use on similar occasions, due provision having been made for the exclusion of fumes, etc., whilst in use, either to rooms or corridors, by the provision of double doors.

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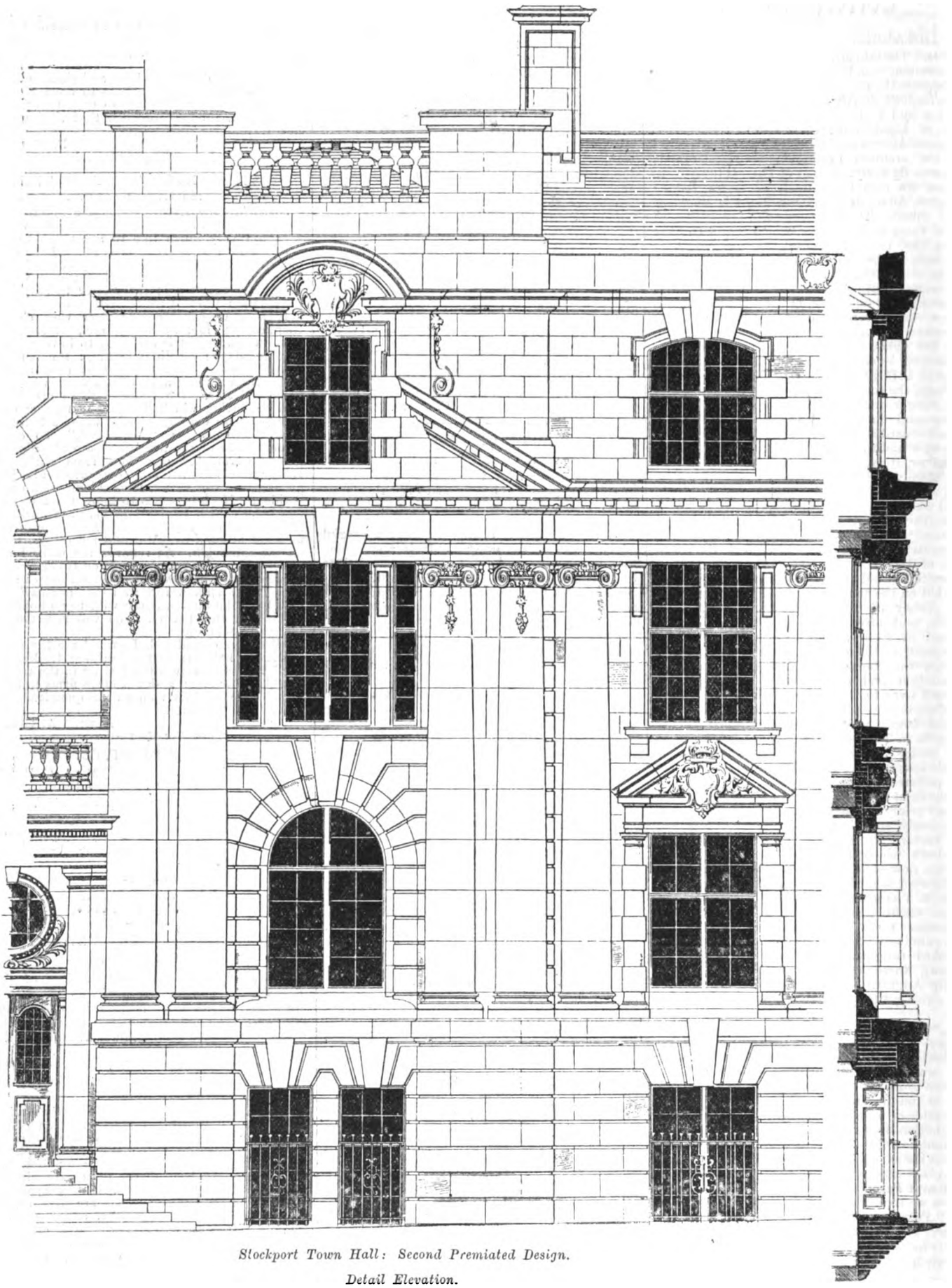

Stockport Town Hall: Second Premiated Design.

Detail Elevation.

Ample and diffused light is obtained to every room, corridor, passage, etc., throughout the structure, including the basement floor. We believe as an absolute certainty there will not be a dark corner in the building, and this without the necessity of using "borrowed" light.

The position assigned to the several conveniences, lavatories, etc., for the various departments throughout have been carefully decided upon. In both courtyards isolated blocks are shown, connected with each floor and away from the principal façades, thus obviating the objection arising from unsightly pipes, cowls, etc., and approached through an ante for additional privacy and sweetness. A separate block of lavatories, etc., are also provided in the basement (furthest away from the business part of the structure) for the exclusive use of lady typists, etc., entered by a "private" corridor—in our opinion a very desirable provision.

Suitable provision for a cleaner's store-room to every floor throughout both the public hall as well as the municipal offices has not been overlooked.

The Public Hall.—As this is to be used for purposes other than municipal, access is required to it at such times as the offices may be closed as well as when the offices are open, and without causing obstruction to the municipal work. Separate entrances from the street were therefore essential, although it is also accessible on the ground floor (and, if desired, on the first floor also) from the council suite for civic purposes, etc. To provide independent access and egress both back and front to this hall from the street, without separation from the municipal offices was, in our

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opinion, a necessity. This we have accomplished by placing same at the easterly side of the site, being the least important for position and aspect, and yet where these objects can be attained in the best and simplest manner. It should be noted also that the ground level of the public hall in our scheme is the same as the upper ground floor of the municipal offices.

The hall is lighted by windows from both sides. The ceiling is segmental in form, and the roof principals are of steel construction without thrust on either side wall. The most careful consideration has been given to ensure that the acoustic properties of both the public hall and council chamber shall be good, many of our public edifices being spoiled by reverberation, which renders them even when filled with people, defective for speaking or musical purposes. The main ceiling is slightly varied in level—not one unbroken surface—with sufficient number of distinct breaks, so that any sound waves which might impinge on the ceiling would be scattered and dispersed rather than reflected to the audience. Columns and deep recesses have been avoided on the side walls, which never aid sound, but a simple surface treatment has been suggested in lieu of same. The science of acoustics having reached a more practical stage, the architect of to-day must consider, besides plan and proportion, the resonant as well as the absorbent qualities of the materials used, as well as their mode of finish, to obtain successful results. This we have endeavoured to do.

The public hall is planned so that if desired it can be built at a future date to the municipal offices without entailing any structural alterations. It will be observed that in planning the public hall and council chamber we have carefully avoided columns, either for construction or ornament, in order that an uninterrupted view may be secured to every occupant. The gangway at the back of the council chamber is also worth noting. By this arrangement the amount of traffic across the floor will be greatly reduced, each member being enabled to reach his particular seat without distracting the others. Every door also would have a check spring fixed in the floor to prevent slamming, and glazed with embossed glass, with a small portion left clear to enable a member to see through from the corridor without opening same.

Although the site is somewhat irregular in shape (apart from the discrepancy in levels), yet the whole of the offices and rooms have been made rectangular in our scheme, the spare spaces being utilised for lighting purposes, knowing the bad effect of crooked roofs, etc., on the façades, apart from the undesirable corners and angles that necessarily arise in the plans.

Architectural Character.—After careful reflection, we decided that a structure in the eighteenth century English Renaissance of stern simplicity (and conforming to your instructions) would be the most appropriate. So far as we know, our design is as original as any may be in the twentieth century; certainly no existing building has been consciously copied, either in whole or part, excepting, of course, in matter of detail. Our ideal has been to obtain the dignity essential for the municipal buildings of an important town, combined with the utmost convenience of internal arrangement together with the maximum amount of light. The architecture throughout has been kept subordinate to the practical requirements, and in no single case throughout the design has the convenience of plan been sacrificed in order to improve the elevations.

Our first consideration has been to produce a design of a monumental yet simple character, and one that will harmonise with the adjoining buildings, also to avoid a "great portico" (two stories in height), which, apart from the grave objection as to interference with the light to many important rooms, would enter into competition with the present erections in the immediate vicinity. We have also refrained from costly balustrading to any appreciable extent, relying upon the skyline being broken by one central and two angle domes of modest proportions. Sculpture has been very sparingly introduced (see ½ in. detail); the curved pediments over ground floor windows to front elevation would lend themselves to the introduction of heraldic quarterings of appropriate character.

We desire to direct attention to the suite of committee-rooms, which on occasion can be converted into a large banqueting hall. The great arched window, being, in fact, the centre of the composition, besides expressing the internal treatment, provides access also to a balcony of ample dimensions over the portico for civic announcements, etc., as well as giving increased height and dignity and extra ventilation to the suite of rooms.

Heating and Ventilation.—It is proposed to heat and ventilate the public hall and council chamber on the lines of the Plenum system; fresh air would be passed through a chamber fitted with dry and wet screens, for sieving and washing the air before passing through the heating chamber. A powerful fan would force hot air in winter and cold air in summer through ducts having outlets in suitable positions in both rooms to secure a uniform distribution. For extracting the vitiated air a brick shaft to be provided, up the centre of which would be fixed the cast-iron smoke pipe from boilers, thus securing in winter a powerful exhaust at a minimum cost. Electric fans also to be utilised in suitable positions, having a collecting chamber connected by exhaust ducts from openings at or near the ceilings, as shall be arranged. The remaining rooms throughout the building would be heated by low pressure hot water or steam radiators, admitting warm fresh air under control, extraction flues being provided at various points to ensure a complete circulation of air, together with the "open" fireplaces already shown.

Drainage.—All drains to be constructed of best stoneware pipes, jointed in cement, well ventilated, and kept clear of the building. All rainwater pipes to be disconnected from soil pipes, and all kept outside the building, the latter to be carried up their full diameter to their highest point. All lavatories and sinks to discharge in the open, and to be disconnected from the drainage. The w.c.'s in main building to be either Doulton's, Shanks', or Twyfords', with after-flush. The lavatories to be fitted with Sir William Thompson's taps, having fireclay tops and skirtings. Inspection caps to be provided to the traps of all fittings.

In the arrangement of the drainage, as briefly described, we would ask you to accept our description as enumerating principles only, and not as a perfected scheme, to be more fully considered and detailed in co-operation with your borough surveyor, should our design meet with your approval.

Brief Specification of Materials.—The walls to be carried up in brick. The principal elevation to Wellington-road to be faced throughout with stone (Portland preferred), and the remaining elevations and the two internal courtyards to have stone dressings, with red stock brick (Accrington or Ruabon) for facing generally, as indicated on the drawings. The floors to be of fire-resisting construction. The roofs to be covered with Westmorland green slate, finishing at the apex with a lead roll. The domes to be roofed with lead, the figure of "Justice," shown at the apex of the central dome, to be in bronze. The offices to have pitch pine wood block flooring cut and laid on the quarter. The council suite to have hard floors. We would recommend the council chamber floor to be laid with Cork linoleum for quietness. The vestibules, entrance hall, corridors, public spaces, lavatories, etc., to have marble mosaic floors of simple design. The principal staircase to be in Hopton Wood stone and the others in York stone. The joinery generally to be selected Kauri pine stained and polished, the council and committee-rooms to be in hard wood, either oak or mahogany.

The architects' estimated cost for the building is 60,418*l.*

HALLYARDS, PEEBLES.

THE old portion of the house of Hallyards was in a dilapidated condition, and had to be entirely demolished.

This old portion had been reroofed and generally tampered with, and an ugly early Victorian addition had been made to the south-east end. At the same time the fine old straight avenue leading from the high road had been abandoned and a new curved approach formed.

The drawing shows the design that was made for an entirely new house on the site of the old. The intention was to reopen the old avenue, and to take an old stone figure of the Black Dwarf that was lying about the grounds and use it as the centre of the small court to the south, past which a stream runs.

On the score of expense, however, and for other reasons, the design had to be modified to the modern addition to the house left standing.

The "Black Dwarf's cottage," with its curious doorway some 3 ft. 6 in. high, is a few hundred yards from the house, and in one of the rooms of the old house of Hallyards Sir Walter Scott wrote the novel which took its title from the Dwarf.

Mr. R. S. Lorimer, A.R.S.A., is the architect.

ST. ANDREWS, HELSINGFORS.

THIS house was recently completed, the work being carried out by local contractors from the architect's detail drawings.

All the sanitary and other fittings were sent from Scotland, the steam heating installation being carried out by Messrs. Mackenzie and Moncur, of Edinburgh, who sent their own men to Helsingfors to fit up the work.

Mr. R. S. Lorimer, A.R.S.A., is the architect.

SKETCH FOR A COTTAGE, BECCLES.

THESE were preliminary sketches for a cottage for a lady, which has since been erected on somewhat different lines. The materials proposed were red bricks and tiles and rough cast.

The Student's Column.

ARCHES.—II.

EARLY in the eighteenth century the department known as the "Ponts et Chaussées" was established in France, and the more scientific design of arched structures began to be developed. One of the most distinguished of the many able engineers connected with that body was Perronet, who designed and superintended the erection of several admirable bridges. The improvements introduced by the engineers of the Ponts et Chaussées more particularly related to the proportions for the rise of the arch and for the thickness of the piers. Consideration was also given to the form of the soffit, with the object of producing a pleasing effect and providing a maximum waterway.

In previous times the general rule was to make the rise very great in proportion to the span, but in reducing the proportionate rise Perronet and his colleagues went a little too far. For instance, in the bridge of Nemours the rise was no more than one-fourteenth of the span, being only 3 ft. 9 in. in a span of 53 ft. 9 in.

During the same period very little was done in England towards the development of the arch as applied to bridge building. Old Westminster Bridge was commenced in 1738, but the designer, Charles Labelye, was a Swiss engineer. The bridge lasted only 100 years after its completion in 1750, owing to the insecurity of the foundations, which simply rested on the gravel bed of the river. Old Blackfriars Bridge, designed by Robert Mylne, was built in the middle of the eighteenth century, and it also had to be replaced after 100 years' service owing to the insecure condition of the foundations.

It is a curious thing that some of the most notable arches built in this country during the eighteenth century were designed and erected by men who, although having no scientific training, were yet able to realise to a very considerable extent the true principles involved.

Thus, we find that the Pont-y-tu-Pridd across the Taff at Newbridge was built in 1750 by a country mason named Edwards. A sketch elevation of this bridge is shown in Fig. 9. The arch has a clear span of 140 ft., with a rise of 35 ft., and the width of the soffit is 15 ft. 10 in. at the springing, diminishing to 14 ft. 5 in. at the crown. The arch stones are 2 ft. 6 in. deep, and the rest of the ring is of rubble masonry. A previously-erected bridge on the same site had failed owing to the excessive weight of the haunches having forced up the crown of the arch. Hence, in designing the new structure, Edwards pierced the spandrils near the abutments of the arch so as to prevent the likelihood of any similar mishap.

Thomas Telford, also beginning life as a simple mason, built quite a number of stone arches, but none of any great size or special importance.

It is stated by Smiles that an attempt was made to construct a cast-iron bridge at Lyons in the year 1755. One of the arches was actually erected in the builder's yard, but nothing further came of the project. The first cast-iron bridge actually built was designed by Mr. Abraham Darby, the owner of the Coalbrookdale Ironworks. Fig. 10 is an outline of this bridge, which was erected in 1777. The arch is of 100 ft. 6 in. clear span, and consists of two 70 ft. cast-iron ribs, connected at the crown, and with a rise of 45 ft. The floor of the bridge is formed of cast-iron plates, 1 in. thick. A town has grown up around the bridge, and has appropriately taken the name of Ironbridge.

Although the Coalbrookdale Bridge was perfectly successful from the day of its completion, no further venture was made for several years in the direction of replacing stone by iron in arch construction.

In 1787, Tom Paine, the well-known author, offered to build a cast-iron bridge with one arch of 400 ft. span in America; and in 1788 he took out a patent for the construction of cast-iron bridges. Although Paine did not secure any commissions as a bridge engineer, his propaganda were useful in attracting attention to the advantages to be derived from the employment of iron in arch construction.

The next practical step in advance was

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evidenced by the erection of the Wearmouth Bridge at Sunderland, designed by Mr. Rowland Burdon, M.P., who also provided the funds necessary for the realisation of his scheme. The bridge, as originally built in 1796, comprised an arch of open cast-iron panels, acting as voussoirs; the clear span was 236 ft., with a rise of 34 ft., and the springings were 95 ft. above the bed of the river, giving a clear headway of 100 ft. above low-water level at the crown of the arch. About 214 tons of cast-iron and 46 tons of wrought-iron were used in the structure.

Here we have one more example of a remarkably bold project devised and carried to a successful issue by an entirely self-educated engineer. Considering the limited amount of information available at that time with regard to cast-iron as a material of arch construction, it is not too much to say that the work of Mr. Burdon—and, let us add, of Mr. Darby—deserved even greater commendation than that of the early builders of masonry arches, who had at disposal the data accumulated during many centuries by their predecessors.

Wearmouth Bridge was repaired and widened at a later date, but after the lapse of more than a century it still serves as the chief means of communication between the northern and southern parts of an important town.

Even at the close of the eighteenth century, there is reason for the assertion that the perception of the properties of the arch was not very much clearer than that attributable to the Romans. Even the introduction of iron did not imply any great increase of knowledge. The Wearmouth Bridge was practically an imitation in iron of the familiar stone arch. True, the superior strength of the material permitted the designer to concentrate it into ribs instead of making a solid arch ring. But this feature was not new, for it had been exemplified in masonry at a much earlier date, when stone ribs were used, being filled in with rough concrete or rubble.

Still, the engineering world was moving forward, for we find that in 1801 Telford seriously made the bold proposal to throw across the Thames a single cast-iron arch with a span of 600 ft. and a rise of 65 ft. A Parliamentary Committee, appointed to inquire into the feasibility of this daring scheme, was chiefly remarkable for the lack of theoretical knowledge displayed by mathematicians and engineers alike. The practical engineer, with a natural aptitude for structural mechanics, and educated in the school of daily practice and experience, was still looked upon as the man from whom the soundest opinion could be obtained.

Telford's scheme came to naught, but he went on in other directions, and in his bridge at Craigellachie, built in 1812, over the Spey (Fig. 11), he marked another important step in the progress of cast-iron arches. This bridge has a span of 150 ft., with a rise of 20 ft., and the design approached far nearer to modern ideals than anything previously attempted.

The opening years of the nineteenth century were characterised by undoubted improvements in the construction of stone arches. John Rennie was the first engineer in the world to recognise the fact that the depth of the voussoirs ought to be proportioned to the pressures coming upon them. In Roman arches the rings were of uniform depth, and in the eighteenth century the voussoirs were often made deeper at the crown than at the springing. Rennie increased the depth of the voussoirs from the crown to the springing, and thus gave to the world a further insight into the correct principles underlying arch construction.

Foremost among the bridges in which this improvement was exemplified were Waterloo Bridge, commenced by John Rennie in 1811, and new London Bridge, erected between 1824 and 1831, under the superintendence of Sir John Rennie, son of John Rennie the first.

London Bridge still deserves to be cited as one of the finest arched structures in existence, although in boldness it is surpassed by bridges constructed centuries ago. The centre arch has a span of 152 ft. with a rise of 29 ft. 6 in., dimensions which fall far below those of the Trezzo arch, erected in the fourteenth century. But in London Bridge we have a splendid example of the masonry arch, appealing with equal force to architects and engineers alike. As may be seen from the drawing reproduced in Fig. 12, the arches are proportioned so beautifully that the excellence of the design must be apparent even to the most casual observer.

In another respect London Bridge affords evidence of substantial improvement, for the foundations of the piers and abutments were laid at a depth of nearly 30 ft. below low water level, thus involving difficulties that were seldom faced by ancient and mediæval bridge builders.

The Grosvenor Bridge over the Dee at Chester, built in 1827-1832, represents the maximum span of any stone arch in this country, this bridge having a single span of 200 ft. and a rise of 42 ft.

The Cabin John Bridge, in America, has the greatest span of any existing masonry arch, the span being 220 ft. with a rise of 57 ft. It carries a 9 ft. diameter conduit and a 20 ft. roadway at a height of 101 ft. above the ravine traversed.

Reverting to the metal arch, we find that even Rennie possessed only an imperfect notion of the theoretical principles involved in this form of construction. Southwark Bridge, completed in 1819, was one of his most important works, with two spans of 210 ft. and one of 240 ft., but the design is distinctly suggestive of stone masonry. Each arch consists of eight cast-iron ribs divided into segments corresponding to the voussoirs of a stone arch, and the bridge has been justly characterised as a heavy and wasteful imitation of stone arch construction.

Numerous cast-iron arches were subsequently built, both in this country and abroad, and even as late as 1871 a bridge of this kind was built at Nottingham with a span of 100 ft., but the development of the suspension bridge about 1820, and of the girder bridge at a later date, had the effect of diverting attention for a time from arched bridge construction.

The first wrought-iron arched bridge was erected at St. Denis in the year 1808; but the employment of wrought-iron in structures of this kind did not become common until after the middle of the nineteenth century, when also much greater knowledge of scientific construction and the strength of materials began to be displayed.

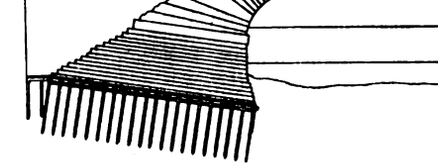

Fig. 9.

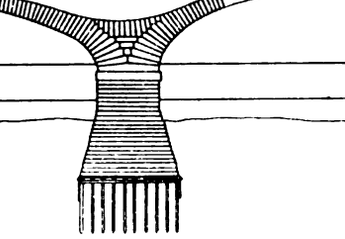

Fig. 10.

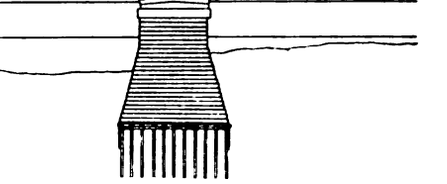

Fig. 11.

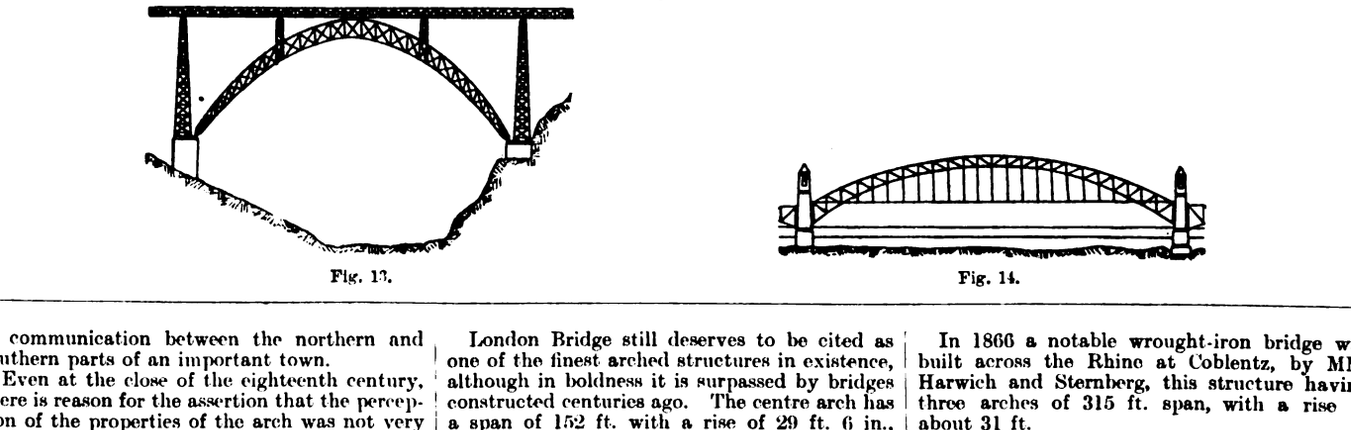

Fig. 12.

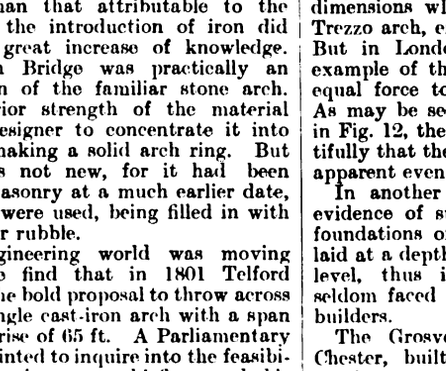

Fig. 13.

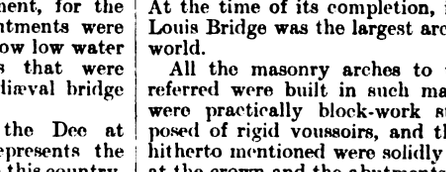

Fig. 14.

In 1866 a notable wrought-iron bridge was built across the Rhine at Coblentz, by MM. Harwich and Sternberg, this structure having three arches of 315 ft. span, with a rise of about 31 ft.

A few years later the St. Louis and Illinois Bridge was commenced across the Mississippi, from the design of Captain Eads, M.Inst.C.E. Although generally classed as a wrought-iron bridge, large quantities of steel were used in the spans, which are formed with ribbed arches, consisting chiefly of steel castings. The centre span is 520 ft. and the two outer spans are each 502 ft. clear; the rise of the centre arch is 47 ft. 6 in. and that of the side arches 46 ft. each. At the time of its completion, in 1874, the St. Louis Bridge was the largest arched span in the world.

All the masonry arches to which we have referred were built in such manner that they were practically block-work structures, composed of rigid voussoirs, and the metal arches hitherto mentioned were solidly connected both at the crown and the abutments.

The first employment of hinges in wrought-iron bridges was exemplified in 1858, in a railway bridge over the St. Denis Canal, in France.

Since 1870 the employment of hinges has become general in metal arches, and, in a modified form, in stone and concrete arches.

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This method of construction is extremely convenient, as, when hinges are introduced at the crown and the springings, the calculation of stresses is much simplified.

In Germany many three-hinged stone and concrete arches have been built, up to 277 ft. span, the hinges being formed by sheets of lead about 1 in. thick, and extending over the middle third of the depth of the voussoir joints. The remaining thirds of the joints are left open, and, as the lead is plastic, this mode of construction forms what is equivalent to an articulation.

Within recent years numerous steel arches of great span have been erected in various parts of the world, one reason for the adoption of the arch being the pleasing effect obtained, and another the avoidance of false-works during erection. Most of these structures have been of the two-hinged and the three-hinged type.

In 1877 the Luiz I. Bridge, over the Douro at Oporto, was completed with the remarkable span of 566 ft. and a rise of 146 ft. This fine arch was built from the designs of M. Seyrig, and is of the two-hinged type.

The Garabit Viaduct, in France, built in 1884 by the same engineer, is another good example of the two-hinged steel arch, having a span of 541 ft. and a rise of 186 ft. The viaduct, which is shown in Fig. 13, consists of a crescent-shaped arch formed by two latticed ribs, and carries a railway at the height of 406 ft. above the level of the water below.

The Washington Bridge, over the Harlem River, New York, erected in 1888 from the designs of Mr. Hutton, also exemplifies two-hinged construction. It has a total length of 2,375 ft., and comprises two principal steel arches of 510 ft. span, springing from granite piers, with a rise of 91.7 ft. The ribs of each arch rest on steel pins carried on cast-steel bearings, the ribs being formed of steel plate and having a nearly uniform depth of 13 ft.

The highway bridge across the Rhine at Bonn is a very handsome structure with three arches. The centre arch (Fig. 14) has a span of 614 ft., and the two outer arches are of 307 ft. span each.

The Niagara Falls arch, completed in 1898 from the designs of Mr. Buck, is a two-hinged structure with a span of 840 ft. clear and a rise of 137 ft. The bridge carries a railroad and a highway, in replacement of a suspension bridge previously existing on the same site, and was erected without causing any stoppage of the traffic. This magnificent structure represents the maximum span hitherto attained in any arch.

For many centuries the arch has been largely used in roof construction, and fine examples of every type are to be found in all parts of the world. Since the introduction of steel, the arch has been still more freely used for the same purpose, the three-hinged type being usually adopted in the present day. A familiar example of the non-hinged roof arch is to be found in St. Pancras Railway Station, the span there being 240 ft. In the United States the arch is largely used for roofs, the three-hinged type being generally adopted, and one of the largest spans, 368 ft. with a rise of 206.3 ft., was to be found in the roof of the Liberal Arts Building at the Columbian Exposition.

In these introductory notes we have not attempted to present a complete chronological record of arch building, but simply to bring together a few examples typical of the developments that have taken place during various epochs in the history of the art, and since the art became a science.

LIVERPOOL CATHEDRAL.—It has been announced that Mr. H. Douglas Horsfall, of Liverpool, has given 5,000*l.* for the purpose of erecting a reredos in the new Liverpool Cathedral. At a meeting of the executive committee of the Cathedral on the 4th inst., a sub-committee was appointed to make the necessary arrangements for the ceremony of laying the foundation-stone, which, it was stated, would probably take place in May or June next.

AN IMPORTANT EXPLANATION.—Mr. Costigan, the secretary of the London Master Builders' Association, writes:—"Mr. James Carmichael builder and contractor, of Trinity-road, Wandsworth-common, has asked me to state that the Mr. Carmichael who was fined 2*l.* last week at the Westminster Police Court for travelling without a railway ticket, is not, and never has been, in any way whatever connected with his firm." We may add that Mr. James Carmichael occupies a high position in the building trade, and is senior vice-president of the London Master Builders' Association.

OBITUARY.

MR. H. DRU-DRURY.—Workmen employed on the South-Eastern and Chatham Railway at Blackheath late on Monday night found the body of a man lying in the four-foot way, and the head some distance from the body. The corpse was subsequently identified as that of Mr. Howard Dru-Drury, twenty-seven years of age, the son of Colonel Edward Dru-Drury, of Maisonette, Woodville-road, Blackheath. Mr. Dru-Drury was in business as an architect at Queen Anne's-gate.

MR. W. STEGGALL.—We regret to record the death, by an accident, on Monday, of Mr. W. Steggall, the builder (trading under the style of Benjamin Goodman). Mr. Steggall was standing on the bridge of a large crane watching the workmen below, when, from some cause or other, to be determined at the inquest (held too late last Thursday afternoon to admit insertion in this issue), the machinery was set in motion, and he was caught by the chain and knocked into the pit below—a depth of some twenty-five feet. He died two hours afterwards from the injuries received in his fall. Mr. Steggall came to London some twenty years ago, and took over the business of Mr. B. Goodman. Seven years ago his son, Mr. William F. Steggall, entered into partnership with him, so that the business will still be carried on on practically the same lines as in the past.

GENERAL BUILDING NEWS.

PARISH HALL, CHIRK, DENBIGH.—A new Parish Hall has been erected at Chirk as a memorial of the King's Coronation and as a tribute to the memory of the late Queen Victoria. The hall comprises an assembly-room 70 ft. long by 36 ft. wide, with stage, retiring-rooms, and lavatories. In the front are the library, reading-room, and secretary's office and additional lavatory accommodation. On the first floor is a council-chamber, 51 ft. 6 in. by 22 ft. 9 in., and a room for technical classes. A caretaker's house forms one wing of the building. The building is in the Jacobean style, and is built of dressed rubble walling with chiselled dressings, both of local Cefn stone; and the roofs are covered with Ruabon red tiles. A ventilating turret crowns the apex of the roof. The buildings are heated with hot-water pipes. Messrs. Grayson and Ould, of Liverpool, were the architects, and Mr. John Stringer, of Sandbach, Cheshire, the contractor.

BUILDING IN YORK.—The activity in the building trade in York which was seen in 1901-2 has shown some falling off during the past twelve months, and the rapid growth of cottage property on the outskirts seems likely to abate. Speculative builders like to see some probability of a return for their outlay, and new houses are not being snapped up as they were twelve months ago. When the citizens rejected the offer of electric trams they may have done the owners of slum property in the centre of the city a good turn, but they discouraged the putting up of more desirable residences round which there was room for the life-giving air to play. In 1899 the number of dwelling-houses completed was 570; in 1900, 547; in 1901, 441; and in 1902, 351; whilst the total for 1903 up to a recent date was 342. Most of these are small houses planned to meet the requirements of the local authority and with very little space to spare, and the extension of the city has been most marked in the South Bank, Poppleton-road, Heworth, and Burton-lane districts. Several larger works have also made substantial progress during the twelve months. The Haxby-road Board School is practically complete, and the school on Poppleton-road is making rapid progress. Other big undertakings are the North-Eastern Railway offices (which will have cost something like 100,000*l.* when ready for occupation), the extensions at the County Hospital, Rowntree's Cocoa Works, the York Union Bank, and the Post Office, and the alterations to business premises in High Ousegate. Two miles and a quarter of private streets have also been made up.—*Yorkshire Herald.*

BUILDING TRADE, OLDHAM.—The past year has seen but little that is striking in regard to the building and allied trades. The depression in the cotton industry has had its effect upon this, as, indeed, upon all other callings, but, perhaps, in not so marked a degree. Taking it all round, the building trade has this year been quieter than for some years past. The wet and stormy weather has somewhat interfered with outdoor operations, but the winter months which have already elapsed have been very open, and what frost and snow there have been have not seriously hampered progress. During the year some mills have been completed—notably at Royton—and others are in course of erection at Leesbrook, Chadderton, Mills Hill, and Ashton-road, and Waterhead. The effect of these new structures has been to stimulate the building of cottage property in the neighbourhood for about half a mile round, but agents have found it somewhat difficult to let this class of property when in the immediate neighbourhood of the mill, the majority of the operatives preferring to reside a good tram-ride away from the scene of their daily toil. In general, however, there has during the year been a rather better demand for cottage property, but it is found that the town is somewhat overbuilt in this respect, speculative building having gone on in the past to such an extent that there is a depreciation in the class, as well as the number, of tenants. Thus, though, as already intimated, the outlook is improving, agents have not had for a number of years before so many houses empty, and the cotton trade depression has made it very difficult in some cases to get rents in, and comparatively little has been done in regard to the erection of better-class property, this being confined almost entirely to an estate on the Coppice, where a considerable number of villa residences have been put up, but the agents' reports are that in that locality there are more second-class houses empty than has been the case for some time past. In the erection of important buildings in the town nothing has been done during the year, with one notable exception—the Greenhill Electricity Station—whilst the Greenhill bridge reconstruction will probably be commenced almost immediately. During the year there has also been completed the Hollinwood Board School and the Waterloo Juniors' Board School, while an addition was made to the old industrial school for the accommodation of blind and deaf children. A satisfactory feature is that the year has passed off without any disputes between employer and employé, and employment being fairly steady, it is unlikely there will be any pronounced distress amongst this class of workers. The only trade question on hand now is that of a notice which has been given to operative masons from the masters' organisation to the effect that an alteration will be made in the working hours, which will be reduced during the winter months. This notice must be given six months ahead, so that it will not take effect during the present winter, and no reply has as yet been received from the operatives' organisation.—*Oldham Standard.*

INFIRMARY, BURY WORKHOUSE, LANCASHIRE.—The Bury Board of Guardians have resolved that the work of building a new infirmary at the union workhouse should be proceeded with at once, and that the tender of Mr. James Byrom, of Bury, for 20,699*l.* should be accepted. Accommodation will be provided in the new building for 128 beds.

BUILDING IN NEWCASTLE.—Again there has been a busy year in the building trade of Newcastle, and the operations conducted have not been restricted to reconstruction of big blocks in the centre of the city, but have extended also to the outskirts, where residential premises have been put up on a very extensive scale, and the suburban districts have been enriched by churches and schools. Newcastle, unlike many of our cities, has for some sixty years been overtaking the vast building projects of Richard Grainger, whose systematic work in the centre of the town provided shops and business premises greatly in excess of the needs of the period. That the work was in the right direction time has proved, and new shops, offices, and warehouses as roomy and elegant have been reared in all parts of Newcastle, and in some instances Grainger's work has been modernised according to later requirements.—*Newcastle Journal.*

BUILDING IN ABERDEEN.—The building trade in Aberdeen during the year has been in a better condition than could have been anticipated. There have been no trade disputes in the building industry, for masters and men have come to the resolution to settle disputes as to wages or other matters affecting the interests either of employers or employees by means of arbitration. So far as actual working operations are concerned the year just closed has not been favourable. The proportion of rainy and unsuitable days has been large, not only interrupting the work and delaying all those who are dependent upon building operations, but preventing so satisfactory a job being made.

GLASGOW BUILDING TRADE.—The building trade has had a long run of prosperity, but, like the majority of industries, it gives indications of having spent itself. For years the tendency to speculative building, and the great demand for houses of a modern kind on the outskirts of the city has given builders and the allied trades an almost unprecedented amount of work, until the supply threatens to exceed the demand. The growing number of unlet houses in the city gradually served as a warning to builders to stay their hands, and for the official year ending August last the output, compared with the previous year, has declined by half a million pounds. This slackening has continued ever since, but not in any very marked degree. But, with a big reserve

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of housing accommodation now available, it is fully expected that the building industry will for a time pass through a much quieter period. Masters do not regard the Housing Commission as a factor to be seriously considered in the problem. They simply realise that the demand for houses of a smaller kind—one and two room and kitchen houses—has been met, and, with trade generally rather dull and the outlook unpromising, builders acknowledge that everything points to a period of quietness in their trade also.—*Glasgow Evening News.*

BUILDING IN BIRMINGHAM.—If the number of new buildings erected in Birmingham during the past year has not been so great as that recorded in some previous years, the last twelve months have witnessed the completion, commencement, or development of several important undertakings of a character calculated to add to the architectural features of the city. In attempting to compile a record of the chief new buildings of the year, one is confronted with the difficulty that it seldom happens that a large building scheme is entered upon and completed the same year. Many of the undertakings, as a matter of fact, extend over several years. A case in point is the new City Arcades, which, although actually completed during the last twelve months, were commenced four or five years ago. Then, again, there is the new University buildings, which are being constructed at Bournbrook. This undertaking has been in hand over twelve months, and it will probably be another year or two before the scheme is completed. Great progress has been made with the preliminary work, and only last week the Council of the University accepted a tender for the erection of the superstructure, which, it is expected, will involve the expenditure of over a quarter of a million sterling. In other instances the buildings, although begun during last year, are still being proceeded with. To this class belongs the Rowton Houses, the foundation stone of which was laid by Princess Christian on the occasion of her visit in June last. The work is being rapidly pushed forward. With the completion and opening last year of the new Central Hall there was a notable accession to the buildings of Corporation Street. The design of this structure is in the Renaissance style, and it is chiefly built of red terra cotta. A distinguishing feature of the building is the campanile, which rises to a height of 180 ft. and is used as an extract ventilator. The ground floor and basement are arranged for commercial purposes. Another distinguishing feature of the building is the main entrance under the campanile from Corporation-street, on the sides of which are two bas-reliefs in buff terra cotta, one of which represents the historic incident of Wesley's rescue from the fire, and the other of his preaching from his father's tombstone. The great hall has accommodation for more than 2,000 people. It is constructed in the form of an amphitheatre, and has roomy and well-lighted corridors extending round.—*Birmingham Mail.*

LEITH BUILDING TRADE.—In his report on the building trade of Leith in 1903, Mr. Finlay, Burgh Surveyor, states that, contrary to expectation, there has been a very considerable amount of work in hand throughout the year. Fifty-eight warrants were granted by the Dean of Guild Court, as against seventy-six in 1902, and the total value of the buildings for which warrants were given was about 268,000*l.* A large sum has been expended on new warehouses during the year, the most important of the new buildings being the grain elevator at the Edinburgh Dock, a building which, when completed, will measure 160 ft. by 120 ft., 116 ft. high. A large elevator is also in course of erection at Salamander-street. Mr. Finlay states that, judging by the amount of tenement property being erected in the burgh, there is evidently a great demand for houses of this class—particularly for three and four-roomed houses. Tenements are being erected in Sloan-street, Dalmeny-street, Iona-street, Dickson-street, and Buchanan-street, and altogether they will accommodate 240 tenants. The tenements passed by the court during the year will accommodate 401 tenants, and will amount in value to about 100,000*l.* There also appears to be a great demand for self-contained houses and villas. On the whole, the year is said to have been an average one as regards the amount of building undertaken, but there are indications that the coming year will be a quiet one.

MANCHESTER CORPORATION BUILDINGS.—One of the busy departments of the Manchester Corporation during 1903 has been that of the City Architect (Mr. H. Price). Among items within the ken of the department are a number affecting the Sanitary Committee, and of these may be placed first the Blackley Housing Scheme, which provides for the erection of 203 houses. The early spring is to see the completion of 150 of the houses, so far have these progressed. There will be six shops of similar design to the cottages. The houses are rendered necessary in consequence of the displacement of people by the demolition of insanitary property and by various improvement schemes. In designing the Blackley dwellings regard has been had to fitness with the rural surroundings of the locality. Several blocks are in short terraces, and a few are of the semi-detached order, with gardens at the back and front. Then there is the Rochdale-road and Sudell-street housing scheme in hand. The committee also have in view a scheme for the erection of workmen's dwellings on a site almost immediately adjoining the colossal shed of the Corporation Tramways Department in Queen's-road, Cheetham, near the junction of the road with Cheetham Hill-road. The plans have not yet been passed. It has, however, been suggested by the Housing Sub-committee that the workmen's dwellings will not have a frontage to Cheetham Hill-road as many people imagined they were to have, but will be placed in such a position as will prevent the class of property with which that road is associated from being out-countenanced by lower-rented buildings. In Bradford-road, which, like the other housing sites, is in North Manchester, there is to be a set of workmen's dwellings for which plans are in preparation. At Monsall Hospital during the year a shelter has been erected to accommodate about a hundred visitors whilst waiting to see their friends among the patients. A detached house for the residence of the Chief Medical Superintendent has also sprung into existence, and the hospital laundry has received the addition of two drying closets.—*Manchester Courier.*

BUILDING TRADE, BELFAST.—The progress of the building trade during the past year has been somewhat uneventful. One contract, however, attracted a considerable amount of attention—viz., the new Royal Victoria Hospital. The new City Hall is attaining very stately dimensions, and within the vicinity of the City Hall some other fine buildings have been completed, among which may be mentioned the Scottish Provident Buildings and the new branch for the Northern Banking Company, in Donegall-square West. The Ocean Buildings, on the other side of the City Hall, exactly opposite the Scottish Provident, are built in red sandstone in the Gothic style. Not far off, in Donegall-place, new premises have been built. In College-square the new Municipal Technical Institute is gradually assuming shape. Further up Great Victoria-street are two warehouses, one at the corner of Howard-street, the other at the corner of Hope-street. At the other corner of Howard-street the new Assembly Hall is being rapidly pushed forward towards completion. In Wellington-place new offices for the Norwich Union Fire Insurance Company are being erected. The new Cathedral in Donegall-street is assuming a more finished appearance. Making allowance for the fact that the building of small house property has fallen off considerably during the last few years, still, as a whole, the building trade in the year just closed has been fairly satisfactory.—*Northern Whig.*

BUILDING IN NOTTINGHAM.—Despite the fact that depression in some of the local industries has driven a large number of artisans to neighbouring towns and villages, the builder was by no means idle within the city boundary. During the past year 1,630 new houses have been certified for occupation, and over 600 minor alterations to houses and business premises have been carried out. Seventeen new streets have been laid out, principally at Sherwood, Sneinton, and Bulwell. Amongst the principal buildings that have been completed during the year are two Wesleyan chapels—St. Ann's Well-road and Mapperley—a large warehouse in Short-hill, and one in Bayard-lane. Messrs. Goddard, Massey, and Warner's premises, which were destroyed by fire the previous year, have been rebuilt and extended in Trafficstreet; Messrs. Coates have built a rope factory at Spring-close, Lenton; a cigar factory has been erected in Queen's Bridge-road, and a warehouse has been built in Woolpack-lane. Messrs. Boots, Ltd., have materially extended their stores in Parkinson-street, and have in hand the erection of a factory in Island-street, London-road, while in High-street they have a block of shop buildings in course of erection. The Nottingham and District Banking Company, Ltd., had their new branch at the corner of Raleigh-street in Alfreton-road completed during the year, and considerable progress has been made with their other new branch in Arkwright-street, while the Joint Stock Bank in Arkwright-street is also nearing completion. New schools in connection with the Roman Catholic Church in London-road have been built, and the Gordon Boys' Home in Cranmer-street is expected to be finished early in the New Year. A further addition to the fine series of shops fronting Long-row is in course of construction. In the ensuing year a number of big new business premises are contemplated in various parts of the city, as well as considerable extensions of existing buildings. Shipstone's Brewery Company are making a big extension of their beer stores at Basford, and the tannery in Albert-street, Bulwell, is also being considerably enlarged. A big block of buildings is to be erected on Lenton Boulevard near the Castle, the site for which has already been cleared, and the box-making works in Plumptree-street are also to be extended.—*Nottingham Express.*

SANITARY AND ENGINEERING NEWS.

BRIGHTON SEA DEFENCES.—The groynes and other sea defences at Brighton having been injured by recent storms, the Works Committee asked the Borough Surveyor, Mr. F. J. C. May, and the consulting engineer to the Corporation, Mr. Philip Lockwood, to report on the subject. Mr. May recommended the erection of a new concrete groyne and a concrete sea wall opposite the Kemp Town slopes. Mr. Lockwood's report is opposed to this advice. He says the cost would be 42,000*l.* at least, and he points out that nearly 90,000*l.* has been spent during the last eight years in groynes and sea defences for Brighton, and the works which have been executed are sufficient to retain a very much larger amount of beach than there is at present. The important question, he says, is how to obtain a sufficient supply of shingle, or other filling material. Shingle is stopped at Hove, Shoreham, Littlehampton, Bognor, Portland, and other places, and 8,000 loads are being carted from the Brighton beach annually for use in the town—over 27,000 loads being taken in 1901 for the foundations of wood paving. He recommends that the removal of sand and shingle from the beach be discontinued. Mr. May, in a second report, reiterates his opinion that new groynes and a sea wall are necessary, and insists that Brighton cannot afford to wait for the shingle to accumulate in a natural way. The committee have decided to do nothing until it has been seen what will be the effect of the non-removal of sand and shingle from the beach.

DOCK AND CANAL WORKS.—If the requisite powers are obtained in the forthcoming session of Parliament, several very large dock and canal works will be carried out in the near future. In connection with the proposed improvements to the Manchester Ship Canal, the engineers estimate that it will cost 71,023*l.* to divert the Mersey by a new cut at Walton Inferior, of which sum 32,000*l.* will be sunk in masonry, concrete, and walling, while the cost of the proposed variation of the level of the bottom of the canal between Letchford Locks and Trafford-road Bridge will be 91,450*l.* If the work is allowed it will mean considerable change in the constitution of the governing body of the concern, for by the Finance Bill of the company the Manchester Corporation are asked to make a large sacrifice of interest on the debentures they now hold to allow 2,000,000*l.* of fresh capital to rank in priority. As a *quid pro quo* in future, eleven directors are to be appointed by the Corporation and ten by the shareholders. A new company is also proposing to spend 396,680*l.* in constructing a dock at Trafford Park in connection with the Manchester Ship Canal. The Humber Commercial Docks and Railway Company put the cost of their proposed new dock at Grimsby at 1,026,855*l.*, beside which the proposal of the Ipswich Dock Commission to spend 26,950*l.* on their property appears insignificant. The Clyde Navigation estimate their expenditure on the Shieldhall Dock at 1,240,494*l.*, and for quays, wharves, and river wall, 491,507*l.* A sum of 100,822*l.* is proposed to be spent on Llanelly Harbour.

EXTENSIVE SEWER WORK AT BETHNAL GREEN.—The Borough Surveyor of Bethnal Green has reported that a large expenditure must soon be incurred in sewer reconstruction. One hundred streets ought to be dealt with at once, at a cost of 20,855*l.*, the items being 35,970 ft. run of 9 in. pipe, 5,520 ft. 12 in. pipe, 1,050 ft. 15 in. pipe, 1,380 ft. 18 in. pipe, 239 man-holes. The Works Committee reported on Tuesday that the works will be required, that they had adopted the Borough Surveyor's report, and were of opinion that the work should be undertaken as promptly as possible.

FOREIGN.

URUGUAY.—It is announced that entries will be received up to April 15, 1904, at the Secretariat of the Legislative Assembly, Monte Video, for an international competition for a Government building which it is proposed to erect in that city. The total cost is not to exceed 700,000 dollars—about 148,750*l.* To the authors of the designs adjudged first, second, and third, in order of merit, prizes of 6,000, 3,000, and 1,500 dollars, respectively, will be awarded.

FRANCE.—M. Couriot, Professor at the Ecole Centrale des Arts et Manufactures, has been

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elected President for 1894 of the Société des Ingénieurs, Civiles.—At its last session, the Municipal Council of Paris decided that the No. 4 Metropolitan railway, between St. Germain des Prés and the Porte d'Orléans, now in course of construction, is to have the following eight stations: Place St. Sulpice, Rue de Vangirard, Rue Vavin, Boulevard Raspail, Place Denfert-Rochereau, Rue Mouton-Duvernet, Rue d'Alésia, and Porte d'Orléans. —A museum of Public Hygiene is to be organised on the site of the old "Marché de l'Ave Maria," behind the Paris Hôtel de Ville. It is to include all the contrivances or inventions for the protection of workmen from accidents in the course of their work.—At the last sitting of the Paris Council, several members made an attack on the "Vieux Paris" Committee for, as they asserted, going out of its proper sphere of protecting ancient buildings and interfering in schemes of public improvement which were out of its province.—The demolition of the Galerie des Machines has been postponed for the present.—On the occasion of the joint centenary of Isabey and Raffet there is to be an exhibition of their collected works in the conservatory on the Cours la Reine; the proceeds to be devoted to the erection of a monument to Isabey.—The "Marché du Temple," Paris, is shortly to be demolished.—A new architectural society has been formed in Haute Saône; M. Humbaire, of Vesoul, being the first president.—M. Gustave Rémy, architect, of Nogent-sur-Marne, has obtained an honorary diploma at the International Exhibition of Melun for his designs for artisans' dwellings.—The city of Orléans has opened a competition for a building for a museum of sculpture and painting and a natural history museum. The estimated cost is 1,200,000 francs.—A new entry to the port is to be formed at Dieppe.—By a decree of the President of the Republic, the ancient ramparts which constitute the lower *enceinte* of Mont St. Michel are to be made over to the ownership and care of the Service des Beaux-Arts.—A stone bridge is to be built over the Rhone between Avignon and Villeneuve, in place of the existing one.—The municipal council of Bordeaux have definitely adopted the scheme for public improvements, among which will be the construction of a large avenue connecting the Place de la Comédie with the Gare Saint Jean, at an estimated cost of 27 million francs.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. E. Jenkin Williams, architect, has removed his offices from 31, High-street to 14, Dumfries-place, Cardiff.—Messrs. Barnes-Williams, Ford, and Griffin, architects, have dissolved partnership. Mr. Barnes-Williams retires from general practice, but will be available for consultation. He will complete such matters as are at present in his personal charge. Mr. Ford retired from the partnership on August 1 last upon his accepting the post of District Surveyor of West Wandsworth. Mr. Alfred Griffin will continue the practice at 30, Coleman-street, E.C., and 24, Railway-approach, London Bridge, S.E., and will receive and pay all debts due to and owing by the late firm.—Messrs. Manlove, Alliott, and Co., mechanical engineers, of Nottingham, have removed their London office from 57, Gracechurch-street to 41 and 42, Parliament-street, Westminster, S.W.—The Leeds Fireclay Company (Leeds) announce that Mr. A. Barrett, who has been their secretary for fourteen years, has been appointed managing director and deputy-chairman; Mr. B. J. W. Lone has been elected a director and appointed to control the sales department in London and the south; and Mr. H. J. Boot has been appointed secretary of the company.—The partnership between Messrs. Gething and Grice, stone and granite merchants, has been dissolved, Mr. Grice having purchased all Mr. Gething's share and interest in the late business, which will be continued by him under the style of "Grice and Co."

PORTLAND CEMENT IN CANADA.—Canadian journals to hand record that the first circular cement kiln of the International Portland Cement Company, of Hull, Ontario, was formally installed a few days ago by the Governor-General, Lord Minto. The International Company's plant, when completed, will cover seven acres with its buildings. They have 110 acres of clay land and 220 acres of cement rock land immediately beside the works, and so arranged that the natural product will be brought into the factory by carriers and conduits with a minimum amount of labour.

INTERNATIONAL SOCIETY OF SCULPTORS, PAINTERS, AND GRAVERS.—This Society will hold a reception on Monday evening, January 11, at 9.30 p.m., in the New Gallery, on the occasion of the opening of their Fourth Exhibition in London. Monsieur A. Rodin, the newly-elected President, will receive the guests of the Society.

DRYING COAL FOR CEMENT KILNS.—The extensive application of coal dust in the firing of rotary kilns in cement manufacture has attracted considerable attention to the best means for pulverising coal to the required degree of fineness. In order to carry out this process successfully and economically, the material should not contain more than one per cent. of moisture, as it is found that the output of a mill when the material contains not more than this percentage is double the output that can be obtained when the coal contains two per cent. of moisture. It is always important to get rid of the surplus moisture without the loss of volatile constituents, and the difficulty attending this operation is increased by the fact that no two samples of coal are alike, some coals giving up their moisture far less readily than others. It has been found that coals in which the ash is largely composed of silica dry easily and thoroughly, while those in which the ash contains a high proportion of lime or clay are correspondingly difficult to dry. It is very important that the drying apparatus should be designed so that warm air in ample volume may be brought into contact with every particle of the coal, and this can be accomplished by causing the current of air to pass from the dried to the wet material. As a general rule, coal can be delivered from the drier at a temperature of about 150 degrees Fahr. without loss of volatile constituents. If the temperature be increased to 225 degrees Fahr., there is generally a loss of gas, and the latter temperature cannot be recommended in practice. The fan used to remove the saturated air generally has the effect of carrying off from three per cent. to five per cent. of the coal dust, but this may be recovered by passing the current through a settling chamber, the walls of which will absorb and retain sufficient heat to prevent condensation from the moisture-laden air.

ARBITRATION.—An arbitration inquiry was commenced on the 5th inst. at the Surveyors' Institution, Westminster, before Mr. H. T. Steward, sole arbitrator, the parties interested being Messrs. Kirk and Randall, building contractors, of Woolwich, and Sir Charles Wyndham. The proceedings had reference to the erection of the New Theatre, St. Martin's-lane, the architect of which was Mr. Sprague. The theatre was built in 1902 and finished at the beginning of last year. Disputes arose between the contracting parties, and Sir Charles Wyndham took possession of the building in December, 1902, and had the work completed. Law proceedings then arose, and it was decided that all matters in dispute should be referred to Mr. H. T. Steward as arbitrator. The claim was for moneys not paid and for wrongful ejection from the building, and there were counter-claims having reference to the completion of the theatre and to the work not having been completed within the contract time. Mr. English Harrison, K.C., and Mr. Clavell Salter apeared for the builders; and Mr. Spencer Bower, K.C., and Mr. Rose-Innes for Sir Charles Wyndham.

THE LONDON MANUAL.—The London Manual for 1904, edited by Mr. R. Donald, and published by Edward Lloyd, Ltd., is the eighth yearly publication of a useful handbook containing information concerning public bodies. The work, which contains a number of portraits of public men and a mass of clearly-arranged statistics and facts, has been carefully edited and is well up to date. It is an admirable record of the work and the powers of the many public bodies in London.

BREMNER MEMORIAL, WICK.—There has just been erected at Wick, Caithness, under the auspices of the Wick Town Council, a memorial to the late James Bremner, the civil engineer and harbour builder. The memorial takes the form of an obelisk, and is placed in a position overlooking Wick Bay. The obelisk is of polished granite, having a height of 35 ft. from the ground.

THE LABOUR MARKET IN THE COLONIES.—The January circular of the Emigrants' Information Office states that in *Canada* the building, metal, engineering, shipbuilding, and manufacturing trades generally continued busy throughout last year, and skilled men, such as carpenters, bricklayers, painters, plumbers, blacksmiths, ironmoulders, printers, boilermakers, woodworkers, lathers, waggon makers, coopers, iron and brass workers, etc., had no difficulty in procuring work. The demand has been such that experienced men, arriving even at this season of the year, would find work in indoor trades, but they should possess a little money on landing. In *New South Wales* the demand for labour has somewhat improved, but it is still small. In *Victoria* there is no demand for labour, and many persons have left the State owing to the depression. Speaking generally, no working man is advised to go to *South Australia* at the present time unless he is specially skilled in his trade, or has friends to go to, or has sufficient money to live on at first. The returns from *Queensland* for the quarter ending September 30 last show as follows:—There was no demand in the north except for some mechanics, general labourers, and female servants at Charters Towers, Townsville, etc. There was a demand in the central districts for general labourers and a few agricultural hands; there was a demand in the south for mechanics, agricultural labourers, and especially for general labourers. In no part of Queensland was there a demand for miners. In *Western Australia* there was a demand for mechanics in the building or other trades at Kalgoorlie, Boulder, Geraldton, Bunbury, Beverley, and Northam; at Coolgardie, Kanowna, and Albany the supply of all kinds of mechanics was excessive, and at Perth and Fremantle the supply was sufficient in the building trades, except for bricklayers, and excessive in other trades; at other places the supply was sufficient. The supply of miners was sufficient everywhere except at Kalgoorlie, Boulder, and Nannine, and at Kanowna and Cue was excessive. In *Tasmania* there is some demand on the west coast for miners and mechanics. In *New Zealand* nearly all trades are well employed; carpenters, coach and carriage workers, blacksmiths, wheelwrights, plumbers, painters, bricklayers, and especially saw-millers have no difficulty in obtaining work. No persons are now allowed to land in *Cape Colony* unless they have secured definite employment in the Colony and possess £20 on arrival. The labour market is overstocked owing to the large numbers of now arrivals, and a great many mechanics and labourers are unable to obtain work. There is, therefore, now no opening for mechanics in the building or other trades, and all persons are warned against going at the present time, unless they go out to situations engaged for them or have means of their own sufficient to keep them for some months. No one can enter the *Transvaal* without a permit, and persons are warned against going there at the present time in search of work. The building trades have become slacker, and the supply of labour is more than sufficient. Many mechanics, and especially unskilled workmen, are out of employment.

THE THAMES STEAMBOAT SERVICE.—For several years past the London County Council has unsuccessfully attempted to obtain the necessary powers to establish an efficient steamboat service on the Thames, and in the forthcoming session Parliament will be asked to consider two proposals having this aim in view. One is the Council's own bill, which follows the lines of those previously deposited, except that this year power will be asked for issuing combined tramway and boat fares. The second bill is entitled the "Thames Steamboat Service," and is being promoted by the Thames Steamboat Company, which was incorporated in 1897 to "acquire the fleet of steamers and piers and landing-places on the river Thames belonging to the Victoria Steamboats Company, Ltd., who, together with their predecessors, had carried on a service of steamers for passengers on the river Thames for the previous sixty years." The company has a fleet of thirty-six steamers, piers at Battersea and Putney, and are the lessees of other piers, but they allege that, owing to being hampered by the inconvenient situation of many of the existing piers, they ceased to run the service in 1901. They now propose to form a trust, consisting of three representatives each of the L.C.C. and the company, and to create a capital of 240,000*l*., of which 60,000*l*. shall be A stock, 120,000*l*. B stock, and 60,000*l*. C stock. All the stock is to bear interest at the rate of 3½ per cent., and be guaranteed by the London County Council, and the company will take the whole of the A and C stock as payment for their undertaking. This bill is, of course, being strongly opposed by the L.C.C.

THE CITY OF LONDON LYING-IN HOSPITAL.—PROPOSED NEW BUILDINGS.—At a recent special court the governors adopted a report prepared by the committee of management, in which it was stated that the foundations and structure of the existing hospital buildings had been seriously injured by the construction by the Great Northern and City Railway Company of a tube railway in close proximity thereto. Some protracted litigation ended in the company's paying them a sum of 3,000*l*. in respect of the damage. Having obtained tenders for the work of reparation and for some necessary alterations and improvements, they found that the lowest tender far exceeded that amount. The committee thereupon resolved to recommend that, having regard to the highly unsatisfactory state of the older portion of the buildings, it would be advisable to altogether replace such portion, rather than to spend money upon partial restoration and attempted improvements of a structure which, in the opinion of their medical staff, had become inadequate to meet modern requirements. Moreover, the fabric was pronounced eighteen months ago to be in an unsafe condition. The hospital stands at the corner of Old-street and City-road, upon a site leased from St.

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Bartholomew's Hospital. The older buildings were erected after Robert Mylne's plans and designs in 1771-3, twenty years after the foundation of the charity at Shaftesbury, otherwise known as Thanet House (built by Inigo Jones) in Aldersgate-street. The hygienic and ventilating arrangements are now obsolete, and a considerable portion of the fabric stands twenty-six flushing boxes. Probably further on the soil without any intervening cellars or arches.

DESTRUCTIVE FIRES.—In the early morning of December 29 a fire that broke out in the roof of the large hall of the Town Hall at Teddington, resulted in the complete destruction of all but the outer walls, with their connecting girders of the building. The block, triangular on plan, comprised the original parochial offices erected at a cost of about 30,000*l.* in 1886, and since used by the Urban District Council and the Justices of the Spelthorne Division of the county; the Bijou Theatre of Varieties on the floor above; the club-room, on the top floor, of the local Jubilee Club; and the nine shops on the ground floor. It is stated that the loss is covered by insurance.—On the previous day Hanley Castle, near Upton, in Worcestershire, with its valuable contents, the property of Sir Edmund Lechmere, was consumed by fire during the absence of the tenants. The mansion, covering one acre of ground, stands on the site and within the old moat of the castle, which from the fifteenth century belonged successively to the Nevilles, Earls of Warwick, the De Spencers, and the Lechmeres. Of the original castle the last portion, a tower, was taken down one hundred years ago, when the stones were used for repairing the bridge across the Severn at Upton, which had been built *temp.* James I. In the fifteenth century the Earl of Warwick rebuilt the nave of the parish church of St. Mary, where, in the north chancel-aisle, are several memorials, 1568-1829, of the family and ancestors of the late Sir Edmund A. H. Lechmere, Bart., for whom Street restored the church in 1858.—In the night of December 28, the Grange at Earl's Barton, Northamptonshire, the residence of Mrs. H. C. Hornby, upon the improvement of which a large sum was recently expended, was totally burned, at an estimated loss of some 35,000*l.*

PROPOSED DEMOLITION OF AN OLD CITY CHURCH.—By the bill being promoted by the St. Bartholomew's Hospital authorities this session, power is asked to demolish the Church of St. Bartholomew the Less, and to merge the parish into that of St. Bartholomew the Great. At present the whole of the ecclesiastical parish, with the exception of one house, is within the precincts of the hospital, and there are few, if any, parishioners of the parish other than those employed in or connected with the hospital. It is provided that the monuments in the church shall not be disposed of, but shall be placed in the chapel of the hospital. The church was originally the chapel belonging to "the House of the Poor, commonly called St. Bartholomew's Hospital," but after the dissolution of the religious establishments by Henry VIII. it was made a parish church for those who inhabited the precincts of the hospital. At the time Stow made his survey the church contained many monuments and brasses of the fifteenth and succeeding centuries, and some of these have been preserved. Towards the end of the eighteenth century (says Mr. George Godwin in "Churches of London") it appears to have fallen into decay, and in the year 1789 George Dance, who was then the architect and surveyor to the hospital, was directed by the governors to make certain alterations and repairs, on which occasion Dance, having first ruthlessly destroyed the interior of the old building, constructed almost a new church, forming an octagon within the original square plan. The old walls were preserved, and the square tower, which still remain. Within a comparatively short space of time the interior became affected with dry rot to an alarming extent, and in 1823 a general rebuilding was commenced under the direction of Thomas Hardwick, who removed the whole of the timber construction, and reinstated it with stone or iron, leaving the plan strictly the same, but entirely altering the details. The church contains a tablet in memory of the wife of Thomas Bodleius, founder of the Bodleian Library at Oxford.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

24,279 of 1902.—R. B. C. DOUGLAS: *Lathe Turning Machines for the Feet of Chairs, Table Legs, and such like.*
In lathe-turning machines, such as "back knife" lathes, an attachment consisting of slidable guards and protectors actuated by a hand lever, which is fulcrumed to the guide frame of the attachment, and connected to the guards or protectors by connecting links.

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

635 of 1903.—G. BILLAM: *Draught Producer for Fires, Chimneys, and other Ventilating Purposes.*
A draught producer for fires, chimneys, and ventilating purposes, comprising in combination a horizontal channel below the hearthstone, a vertical pipe at the end of said horizontal channel, projecting from the hearthstone, a piece of wire gauze closing the upper end of such channel, a joint at the upper end of the vertical cylinder, a vertical pipe adapted to be placed on said vertical cylinder, a fan-shaped mouthpiece at the top of said vertical pipe standing at an angle to said vertical pipe and turned towards the fireplace, and a valve in said vertical pipe for regulating the draught in the draught producer.

2823 of 1903.—R. W. ODDY: *Domestic Fire Ranges.*
In domestic fire ranges a shallow hot-air chamber, or box, applied at the rear of the oven or boiler, and having an opening at its upper end communicating with the hollow top or exit flue, said opening being controlled, or the area thereof regulated, by a damper or sliding plate.

2971 of 1903.—L. H. ELLINGTON: *Combined Folding Table and Cabinet.*
A combined folding table and cabinet, in which the folding table, or top, turns on a central vertical fulcrum, and in which the cabinet is provided with trays or drawers, or both, that are adapted to be pulled out and then to rest on fall-down end-flaps, which are hinged to the ends of the cabinet.

3052 of 1903.—F. W. ADAMS: *Casement Stays.*
A casement stay, consisting in the combination with the rod of a pivoted guide box through which the rod passes, and of a gravity locking lever pivoted in the guide box, and provided with a projection adapted to engage with any one of a series of slots in the rod.

3100 of 1903.—A. FOSTER: *Reversible Drawback Latches and Locks.*
A drawback latch or lock, consisting of a slider formed with a portion which passes through an endway slotted opening formed through the front of the case, with a portion which lies against the inner face of the front plate, and a latch bolt which is a sliding fit between the front and back plates of the case, and is thereby prevented from moving sideways within the case, the said slider and bolt being formed each with a portion, of which one is detachably engaged with the other by merely putting the parts together without subsequent manipulation, and the said bolt being constructed so that, when reversed, it will correspondingly engage with the slider, and the slider being constructed to come against the side of the bolt while it is also against the inner face of the front plate, and being thereby maintained in position sideways entirely by the front plate and bolt.

3510 of 1903.—J. LAMBERT: *Letter-boxes.*
This invention relates to letter-boxes applicable to doors of houses, offices, and like positions, and relates more particularly to letter-boxes for doors to which the ordinary letter-box is inapplicable on account of its size, the object of the invention being the production of a collapsible letter-box, which is expanded to admit of letters being inserted whenever the letter plate or flap is operated, and which closes automatically when the letter-plate or flap is released.

11,665 of 1903.—J. SHERWIN: *Domestic Fireplaces.*
A domestic fireplace, consisting in the combination with the ash-pit of an ante-chamber or air pit, said ante-chamber or air pit being so placed, fixed, or constructed as to be capable of receiving the ashes from the hearth, admitting air underneath the fire, and allowing for the easy removal of the ashes from below the fire, if desirable, whilst the fire is burning.

13,766 of 1903.—A. E. BUCK: *Rests for Grindstones and Abrading Wheels, and the like.*
Rests for grinding and abrading machines, which consist of a bar, or rest proper, with an open slot at each end, which is free to move upon, and is held in position by, two pins, which are fixed to a rigid bracket, the whole being inclined at a sufficient angle to permit the bar, or rest, to maintain its position with regard to the grinding or abrading machine.

19,730 of 1903.—W. H. FISHBURN: *Window Screen Hangers.*
A window screen hanger, consisting in the combination with slotted brackets attached to the window-frame on opposite sides, and projecting away from the frame, the said slots being closed at the bottom and open at the top, and clips attached to the top of the screen sash and provided with projections adapted to enter the bracket slots.

20,307 of 1903.—E. HUGHES: *Table adjusting Device.*
A table adjusting device, comprising a clamping member, a lower tubular member adjustably connected to the clamping member, a rod having a sliding connection with the lower tubular member, an upper tubular member supported on said rod, a bracket member secured to the table top, and a double-hinged member adjustably adjoining the bracket member and the upper tubular member.

21,677 of 1903.—F. FOUCHE: *Metallic Radiators for Heating and Cooling.*
This invention relates to the construction of metal radiators, or apparatus for effecting exchange of heat, of the kind wherein a fluid (liquid, vapour, or gas) at a given temperature is conveyed to the interior of a series of hollow plates, or radiators, with thin metal walls placed side by side, and another fluid at a different temperature is conveyed into the spaces separating the hollow plates, or radiators, from one another, so that the fluid of lesser temperature absorbs heat from the fluid at the higher temperature, through the metallic walls, until equilibrium of temperature is established. These radiators are superposed or are arranged side by side, and intercommunicate by means of one or more passages.

22,631 of 1903.—F. G. BLAKE: *Outside Shop Blinds for Business and other Premises.*
This invention relates to an improvement in connection with outside shop-blinds for business and other premises, and consists of a facia so fixed on the blind lath as to show, when the blind is down, the name of the firm on the opposite side of the road, which would otherwise be hidden by the shop-blind.

23,177 of 1903.—J. WILLS: *Refrigerator Buildings.*
A refrigerator building, comprising two or more floors, consisting of an elevator shaft having openings at each floor, a closed elevator car open at the front only, and flexible bridging pieces for surrounding the contiguous openings of the car, and elevator shaft to provide a vestibule for closing the stays between the car and the shaft openings.

24,267 of 1903.—C. PRANGEMEIER: *A Tool for Holding Nails while the same are being Driven in.*
A tool for holding nails while the same are being driven in, comprising, in combination, a pair of shanks and cheeks at their front ends, rotatable around a pivot, the upper cheek receiving and covering the lower cheek, oppositely situated vertical grooves in the vertical abutment faces of the two cheeks for the reception of the nail, and a wider bore at the upper ends of the grooves for the accommodation of the nail head, which is protected from direct blows of the hammer by the head portion of the cheek uncovering the same.

13,733 of 1903.—C. E. F. HASSART: *Prismatic Glass Lights.*
A prismatic glass light, comprising on one and the same plate of glass, the combination of prisms, and faces parallel to the smooth face of the plate with symmetrical alternation of the angles of the base of the prisms.

27,445 of 1902.—A. PICKLES & P. R. SEWELL: *Tube, Conduit, Pipe, and the like Cleaners.*
A tube or pipe-cleaning apparatus, consisting in the combination and arrangement of a series of cutters mounted upon the forward end of a central spindle, a sleeve provided with helical vanes, or cleaning brushes, mounted loosely upon such spindle, and a turbine-like propeller, one element of which is secured to the spindle, while the other, or guide-blade portion, is mounted upon a boss that is carried loosely upon the central spindle, and to which a retaining shackle is secured.

2111 of 1903.—J. ERATH: *Construction of Roofs, Ceilings, Floors, Partitions, and the like.*
A method of construction of fire-resisting horizontal or arched ceilings or roofs, dividing floors, with timber or iron framework, and partitions or lining applied to damp walls, or walls serving to keep out heat or cold free from cracks and adapted to deaden sound, the main feature of such method of construction being that, through the medium of bearing irons of special shape, or bars or rods, or of a combination of such irons and bars or rods, the ceilings or the like are suspended, and the walls or the like secured in place, in such a manner that, between the ceiling and timbering, or framework, or between the lining, or facing, and wall, there is enclosed a layer of air.

2765 of 1903.—W. JACKSON: *Method of Slating and Tiling Roofs.*
The slates, or tiles, or other similar roofing materials, to be laid on ordinary battens, the bottom corner slate or tile to be laid at an angle of 45deg., and the remainder to be laid at the same angle, each course to follow on three inches lower than the adjoining one, and the head to abut up to the tail of the slate or

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tile of the next course above it, to allow for three inches lap. The battens to be laid at such an angle that the top corner of each slate or tile rests on them. Each slate or tile to be holed for nailing 3½ in. from left-hand bottom corner and right-hand top corner, and be 1 in. from sides.

2783 of 1903.—SUTCLIFFE, SPEAKMAN, & Co., LIMITED, & E. R. SUTCLIFFE: *A Method of Making Bricks, and Apparatus therefor.*

This consists in the combination in a brick-making machine of a pug-mill with two brick presses, means for driving the same from a common first-motion shaft and pulleys, a reciprocating mould-box containing two moulds, a drum and lever mechanism for reciprocating same, plungers working in each mould, duplicate cam and lever mechanism for operating the plungers so as to effect the feeding of the material under pressure in one mould while the clot is being pushed out of the adjoining mould, and duplicate cam and lever mechanism to operate sliding rakes for drawing the clots on to the table of each brick press alternately.

4435 of 1903.—J. WETTER (O. HEISE): *Impregnation of Wood.*

A process for the uniform impregnation of wood with any desired quantity of impregnating liquid, which consists in introducing the desired quantity of impregnating liquid into the wood with the aid of pressure, and subsequently treating the wood with saturated or superheated steam, or with hot pressure gases, or with a mixture of steam and hot pressure gases.

20,929 of 1903.—R. F. GILLIN & F. C. BOSTOCK: *Plumbing Systems for Flushing and like Purposes, and Valves and Connections therefor.*

In its complete form the system includes a closed air-tight tank, located at a high point in the building, and supplying the water-closets and urinals on the several floors. Water enters through a pipe from the street main at a low point in the tank, and, by its rise, compresses the air imprisoned above it; the air thus compressed serves to produce a rapid flow or initial rush of water to the closets or urinals when their respective valves are operated, and thus insure thorough cleaning. A normally submerged air valve in the tank controls an air inlet pipe, and serves to prevent the formation of a partial vacuum in the tank when the water level falls by reason of frequent use, and permits the remaining water to escape by gravity if the street pressure is insufficient to maintain the supply. The self-closing flushing valves for the closets are designed to prevent unnecessary waste, and the connections from the valves to the closets and to the supply pipes are so arranged as to permit the closets to be easily installed under all conditions of location without danger of fracture by strains due to inaccuracies in pipe-setting or other causes.

21,411 of 1903.—J. SCULLY: *Fire-proof Buildings.*

This consists in the combination with the walls and floor of a structure of a fire-proof tower within the structure and extending through the floor, a ventilating shaft within the tower and communicating with the interior thereof, means for sealing the tower against the admission of gases from the interior of the structure, a supply and discharge pipe within the ventilating shaft, distributing pipes within the floor, ends thereto extending from the floor, sprays upon the ends and gutters within the floors communicating with the discharge pipe.

21,669 of 1903.—H. SWEETMAN: *Paving.*

A paving for roadways, footways, and the like, consisting in the combination of oblong rectangular granite blocks, longitudinal and cross-cut grooves formed on the upper surface of said blocks, a longitudinal cement joint connecting said blocks together, a bed of mortar similar to York paving upon which the blocks rest, and a concrete foundation for the whole.

23,943 of 1903.—W. H. CALLAN: *Ball Valve for Cisterns.*

This consists in the combination with a cistern of a tube upstanding therein and connected with the water supply; a screw-on or other cap to the said tube, the said cap having a central hole or tube and a conical recess on its inner face, and holes or tubes opening communication between the conical recess and the upper part of the cap, which is preferably made dome-shaped; a spindle surmounted by a floor ball, and slidable in the central hole, and carrying a plug corresponding to the conical recess in the cap, below which plug is a leather or other washer suitably supported.

24,292 of 1903.—R. ILLEMAN: *Apparatus for the Manufacture of Building Blocks, Slabs, and the like.*

The method of making two or more building blocks or slabs at the same time by arranging a corresponding number of moulds side by side in partitions, by which they can be quickly and tightly forced together between uprights, means being provided for pouring cement or plaster into the moulds whilst so held together and for releasing the moulds when the cement or plaster has set and taking them apart sufficiently to enable the blocks or slabs to be removed. The moulds consist of side frames, bolted at their lower ends to a cross-beam, a hinged top having a tongue entering into the space between the top ends of the side-frames, a fastening to hold down the hinged top, and projections where required in the inner edges of the mould to form corresponding recesses in the edges of the blocks or slabs, and openings to receive bars passing across the interior of the mould and round which cement or plaster is poured, so that, when removed, the corresponding hollows are left in the block or slab, handles to facilitate the moving of the parts of the moulds, the sides of the mould representing the flat sides of the block or slab being open, but being closed by plates held tightly against the frame whilst the cement or plaster is poured in, and allowed to set.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 18.—By GILLART & SONS (at Portmadoc)

Llanfrothen, Merioneth.—"Tyfry Farm," 88 a. 0r. 37 p., f.	£1,330
"Tymawr Farm," 113 a. 1 r. 18 p., f.	1,800
"Pantywrach Farm" and "Ysguborgoch Holding," 133 a. 3 r. 7 p., f.	1,900
"Llan Farm," 73 a. 1 r. 23 p., f.	1,375
"Maesgwyrlleyn Farm," 48 a. 2 r. 36 p., f.	675
"Caedynewid Fields," 20 a. 0 r. 8 p., f.	225
"Cennant House" and 9 a. 0 r. 19 p., f.	465
"Penybwlch Farm," 7 a. 3 r. 3 p., f.	470

December 23.—By Beadle, Wood, & Co. (at East Ham).

East Ham.—56 and 58, Burgess rd., u.t. 997 yrs., g.r. 12*l.*, w.r. 72*l.* 16s.	500
5 to 29 (odd), Bartle-av., u.t. 997 yrs., g.r. 52*l.*, w.r. 371*l.* 16s.	1,900

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

MONDAY, JANUARY 11.

Royal Institute of British Architects.—Mr. Aston Webb, R.A., president, "at Home."

International Society of Sculptors, Painters, and Gravers.—Reception in the New Gallery, on the occasion of the opening of the fourth exhibition in London. M. A. Rodin, president, will receive the guests. 9.30 p.m.

Surveyors' Institution.—Discussion on Mr. H. T. Scoble's paper on "Industrial Decentralisation, an Important Factor in the Solution of the Housing Problem." 8 p.m.

Glasgow Philosophical Society (Architectural Section).—Mr. John Taylor on "Modern House Decoration and Furnishings," illustrated. 8 p.m.

TUESDAY, JANUARY 12.

Institution of Civil Engineers.—Mr. A. Millar on "The Electrical Re-construction of the South London Tramways on the Conduit System." 8 p.m.

Institute of Builders.—"Conditions of Contract Sub-Committee." 3 p.m.

WEDNESDAY, JANUARY 13.

Society of Arts (Juvenile Lectures).—Mr. Eric Stuart Bruce, M.A., on "Navigation of the Air." 5 p.m.

Edinburgh Architectural Association (Associates' Section).—Lantern night. 8 p.m.

Northern Architectural Association.—Mr. T. J. Gueritte, C.E., on "Reinforced Concrete and its Applications," with lantern illustrations. 7.30 p.m.

THURSDAY, JANUARY 14.

Institution of Electrical Engineers.—(1) Adjourned discussion on Mr. P. V. McMahon's paper on "The City and South London Railway: Working Results of the Three-Wire System applied to Traction, &c." (2) Dr. Hans Behn-Eschenburg on "The Magnetic Dispersion in Induction Motors and its Influence on the Design of these Machines." 8 p.m.

Leeds and Yorkshire Architectural Society.—Annual dinner, Queen's Hotel, Leeds. 7 p.m.

Manchester Society of Architects.—Professor Beresford Pite on "Architecture—Free or Registered," a protest against the Architects' Registration Bill. 6.45 p.m.

FRIDAY, JANUARY 15.

Royal Institution.—Rt. Hon. Lord Rayleigh, M.A., on "Shadows." 9 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. C. R. Bonn on "Steel Work Construction." 8 p.m.

Institution of Mechanical Engineers.—(1) Nomination of Officers for election at the Annual General Meeting on February 19. (2) Paper to be read and discussed: Sixth report to the Alloys Research Committee on "The Tempering of Steel," by the late Sir William C. Roberts-Austen and Professor W. Gowland. 8 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" at railway dep't.
Red wire Cuts	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamfered, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamfered, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	29 0	per ton, delivered.
Best Ground Blue Lias Lime	20 6	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fire Clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington depot	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot.
Beer in blocks	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality.*

	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. " cube.
" " " 6 in. sawn both sides landings	2 7	deld. rly. depôt. per ft. super.
" " " 3 in. do.	1 2½	deld. rly. depot. " "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 best seconds "	12 15 0	" "
20 × 12 " " "	13 10 0	" "
16 × 8 best " "	7 0 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 best blue Portmadoc	6 12 6	" "
20 × 10 best Eureka unfading green	15 2 6	" "
20 × 12 best Eureka unfading green	17 2 6	" "
18 × 10 " "	12 10 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 10 0	" "
18 × 10 " "	9 10 0	" "
16 × 8 " "	6 10 0	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depot.
Hip and Valley tiles	3 7	per doz. " "
Best Broseley tiles	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz. " "

(*Continued on page* 45).

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COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered.
Branch Library, Hutchesontown	Glasgow Corporation	Not stated	Not stated.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
School, &c., Carter Knowle-road, Sheffield	Education Committee	Holmes & Watson, Architects, 38, Church street, Sheffield	Jan. 11
Corrugated Iron School Building, Hengoed	Glamorgan County Council	T. M. Franklin, Clerk to Council, Westgate-street, Cardiff	do.
Road Widenings	Ashton-upon-Mersey U.D.C.	F. Hutton, Surveyor, Public Hall, Ashton-upon-Mersey	do.
Addition to Schools	Bedford Borough Education Com.	H. Young, Architect, Maitland-street, Maitland-road, Bedford	do.
Wood Blocks	Bethnal Green Borough Council	Borough Surveyor, Town Hall, Bethnal Green	do.
Granite Kerb and Pitch	do.	do.	do.
Sinking a Waterworks Well, &c.	Clay Cross U.D.C.	W. H. Radford, Albion-chambers, King-street, Nottingham	do.
2,347 Yards Iron Pipes	do.	do.	do.
Sewering, &c., George-street, Newton Heath	Paving Com., Manchester Corp.	Surveyor's Office, Town Hall, Manchester	do.
Sewering, &c., Wilton-street, Newton Heath	do.	do.	do.
Draining, &c., Burton-street, West Gorton	do.	do.	do.
Draining, &c., Corby-street, West Gorton	do.	do.	do.
Draining, &c., Matthews-street, Ardwick	do.	do.	do.
Draining, &c., Passage, West Gorton	do.	do.	do.
Sewering, &c., Passage, Newton Heath	do.	do.	do.
Kerbing, Paving, &c., Theodore-road	Lewisham Borough Council	Surveyor, Town Hall, Catford	do.
" " Adamsrill-road (part of)	do.	do.	do.
" " Whatman-road	do.	do.	do.
Drainage at Cemetery	Southborough U.D.C.	W. Harmer, Surveyor, 137, London-road, Southborough	do.
Generating Plant	Glasgow Corporation	W. A. Chamen, 75, Waterloo-street, Glasgow	do.
House and Farm Bldgs., Upperclough, Linthwaite	.....	C. F. Mallinson & Son, Surveyors, Market-place, Huddersfield	do.
Wesleyan Sunday School, Skelmanthorpe	.....	J. Berry, Architect, 3, Market-place, Huddersfield	do.
Police Station, Pontnewydd	Monmouth County Council	W. Tanner, F.S.I., County Surveyor, Newport, Mon.	Jan. 12
Stane Skew Bridge, Midgeholme	Cumberland County Council	G. J. Bell, County Surveyor, The Courts, Carlisle	do.
Rough How Bridge, Crosthwaite	do.	do.	do.
Five Pumping Stations, Saltley, &c.	B'ham Tame & Rea Dis. D'age Bd.	J. D. Watson, A.M.I.C.E., Eng'r's Off., Tyburn Cas., B'wich St., M.R.	do.
Road Works, Walford-road, Northwood	Watford R.D.C.	E. Tailey, Surveyor, 9, Market-street, Watford	do.
Twelve Houses, Haigh	.....	R. & W. Dixon, Architects, 5, Eastgate, Burnley	do.
*Street Improvement Works	Bromley Boro' Council	Boro' Engineer, Municipal Offices, Bromley	do.
*Roadmaking and Paving Works	Willesden District Council	Engineer to the Council, Public Offices, Dyne-road, Kilburn, N.W.	do.
Sewering Work, Hollinsend	Handsworth U.D.C.	B. Powell, Surveyor and Engineer, Council Offices, Handsworth	do.
Improvement of Main Road, Cadoxton (Neath)	Glamorgan County Council	County Council Offices, Westgate-st., Cardiff	Jan. 13
Widening, &c., Main Rd.. nr Bonvilstone, Old Toll H.	do.	do.	do.
Widening the Cowbridge, &c., Main Rd., nr Talygarn	do.	do.	do.
Draining Main Road at Brynsaddler	do.	do.	do.
Curbing in the Llandaff Division	do.	do.	do.
2,700 Tons of Granite	Kingston-on-Thames Corporation	Borough Surveyor, Clattern House, Kingston	do.
Two Boilers at Workhouse	Ormskirk Guardians	Engine, Boiler & Employers' Liability In. Co., 12, King-st., Manr.	do.
Waterworks (Divisions II. and III.)	Galway U.D.C.	J. Perry, M.Inst.C.E., County Surveyor's Office, Galway	do.
Stores	Rochdale Canal Co.	80, Dale-street, Manchester	Jan. 14
Carnegie Branch Library, Askam	Dalton-in-Furness U.D.C.	W. Richardson, Surveyor, Public Offices, Dalton-in-Furness	do.
Section D Pipework	Pontypridd U.D.C.	R. P. Wilson, 66, Victoria-street, Westminster	Jan. 15
2,600 Yards Gas Mains, Wattstown	Rhondda U.D.C.	O. Thomas, Engineer, Gas and Water Offices, Pentre, R.S.O.	do.
Electricity Meters	Belfast Corporation	V. A. H. M'Cowen, City Electrical Engineer, Belfast	do.
Institute, Warley Town, Halifax	Mr. A. S. McCrea	Messrs. Walsh & Nicholas, Museum Chambers, Halifax	do.
Villa Residence, Chapel-street, Barnsley	.....	Senior & Clegg, Architects, 15, Regent-st., Barnsley	do.
Alterations, Pupil Teachers' Coll. Bldgs., Princess-st.	Manchester Education Committee	W. Windsor, Quantity Surveyor, 37, Brown-street, Manchester	Jan. 16
Metal Breaking and Carting Work	Burgh of Elgin	A. A. Turriff, Burgh Surveyor, Elgin	do.
Sludge Steamer	Glasgow Corporation	Office of Public Works, City Chambers, Glasgow	do.
Take Down & Rebuild 3 Shops in Taff-st., Pontypridd	Rhondda Valleys Brewery Co.	A. O. Evans, Architect, Pontypridd	do.
7,100 Yards Armoured Cables	Wallasey U.D.C.	J. A. Crowther, Electric Supply Works, Sea View-rd., Liscard	do.
Parsonage Home, Tallylyn	Rev. J. Williams	G. T. Bassett, A.R.I.B.A., Aberystwyth	do.
County Police Station, Winchburgh	Linlithgowshire County Council	W. M. Scott, Architect, Linlithgow	Jan. 18
Hartshill Stone	Woodstock R.D.C.	Surveyor, District Council Offices, Woodstock	do.
Electric Tram Car Bodies	Manchester Corporation	J. M. M'Elroy, 55, Piccadilly, Manchester	do.
Electrical Equipments for Cars	do.	do.	do.
Tram Car Trucks	do.	do.	do.
*Hard Shepley Stone Landings	M.B of Paddington	Town Hall, Paddington, W.	do.
*Making up and Paving New Streets	Camberwell Borough Council	Borough Engineer, Town Hall, Camberwell, S.E.	do.
Private Street Works	Chadderton U.D.C.	A. W. Cox, Surveyor to Council, Chadderton, Oldham	Jan. 19
Steel Girder Footbridge, Grimshaw-lane	do.	do.	do.
New Street Works	Horwich U.D.C.	Surveyor, Council Offices, Horwich	do.
Gravel Flint, Granite, &c., Kelvedon	Braintree R.D.C.	E. H. Bright, Surveyor, Dodds Hall, Braintree, Essex	do.
Pulling Down & Rebldg. Old Royal Oak H'l, Barnsley	Messrs. J. Fox & Sons	Tennant & Bagley, Architects, Pontefract	do.
*Mercantile Marine Office, Royal Albert Dock	Commiss. of H.M. Office of Wks.	J. B. Westcott, H.M. Office of Wks, Storeys Gate, West'ster, S.W.	do.
*Erection of Forty-two Houses at Cheltenham	G.W.R. Co.	Engineer, Gloucester Station	do.
Iron Tank, Cockshutt's-lane, Oughtibridge	Wortley R.D.C.	G. E. Beaumont, Surveyor, Grenoside, near Sheffield	Jan. 20
Reservoir Works " "	do.	do.	do.
Stone, &c., for One Year	B'ham. Public Wks. Committee	G. Price, City Surveyor, Council House, Birmingham	do.
Stores for One Year	do.	J. Price, City Engineer, Council House, Birmingham	do.
Three Business Premises and One House, Aberfan	.....	W. Dowdeswell, Architect, Treharris	do.
Additions to Sanatorium	Blackpool Sanitary Committee	J. S. Brodie, Borough Engineer, Blackpool	do.
*New Free Library, Clarendon-gardens, Ramsgate	Ramsgate Corporation	Town Clerk, Albion House, Ramsgate	do.
*Making up and Paving Street	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.	do.
Street Works, Porth, &c.	Rhondda U.D.C.	W. J. Jones, Engineer and Surveyor, Pentre, Rhondda	Jan. 21
50 to 60 Tons Iron Pipes	Harrogate Corporation	G. Wilkinson, Corporation Electricity Department, Harrogate	Jan. 23
Convent School, Edgeworthstown	.....	Very Rev. Canon Martin, Presbytery, Edgeworthstown, Ireland	do.
*Restoration of Shaftesbury-road School	East Ham Education Committee	R. L. Curtis, Architect, 120, London Wall, Moorgate-st., E.C.	Jan. 24
1983 Yards super. of Flagging for Paths	Belfast Harbour Commissioners	G. F. L. Giles, Harbour Engineer	Jan. 25
Widening Railway, Kirkby, Rainford, &c.	Lancashire & Yorkshire Railway	Engineer's Office, Hunt's Bank, Manchester	Jan. 26
Corrugated Iron Shed, &c.	Walthamstow U.D.C.	G. W. Holmes, Engineer to Council, Town Hall, Walthamstow	do.
*Alterations and Additions to Royal Mint	Commissioners of H.M. Works, &c.	J. B. Westcott, H.M. Office of Works, Storey's Gate, S.W.	do.
*Fire Brigade Station at Kensington	London County Council	Architects' Department, 3, Warwick-street, Charing Cross, S.W.	do.
*Supply of Articles and Execution of Works	Chelsea Borough Council	Borough Surveyor, Town Hall, King's-road, S.W.	Jan. 27
Detritus and Screening Chambers, &c., Warley	Oldbury U.D.C.	J. T. Eayrs, M.Inst.C.E., 39, Corporation-st., Birmingham	Jan. 28
Pumping Station, &c., Warley	do.	do.	do.
Eight Labourers' Dwellings	Birr U.D.C.	H. Browne, Town Surveyor, Town Hall, Birr, Ireland	Feb. 1
Painting	Lancashire & Yorkshire Railway	Engineer's Office, Hunt's Bank, Manchester	Feb. 8
*Erection of Epileptic Homes, &c.	Chorlton & Manchester Asyl. Com.	Giles, Gough, & Trollope, 28, Craven-street, Charing Cross, W.C.	Mar. 4
Parish Church, Claremorris, Tuam, Co. Mayo	Venerable P., Kilkenny	D. W. Morris, Surveyor, Dublin	No date
Extension to Works, Bagby Fields	G. Bray & Co.	G. F. Bowman, Architect, 5, Greek-st., Leeds	do.
Tutor's Residence, Wesleyan College, Headingly	.....	Danby & Simpson, Architects, 10, Park-row, Leeds	do.
Crematorium, Lawnswood Cemetary	Headingly-c.-Burley, Burial Board	W. S. Braithwaite, Architect, 6, South-parade, Leeds	do.
Extension of Post Office, Hawick	Commissioners H.M. Works	H.M. Office of Works, Edinburgh	do.
*Alterations, &c., Union Workhouse	Shardlow Guardians	Naylor & Sale, Architects, Irongate, Derby	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	Aylesbury R.D.C.	3*l.* 3*s.* per week	Jan. 11
Borough Surveyor, Faversham	Town Council	200*l.* per annum	Jan. 12
Inspector of Nuisances, &c., Faversham	do.	100*l.* per annum	do.
Surveyor	Felixstowe & Walton U.D.C.	200*l.*	Jan. 16
*Clerk of Works	Hearts of Oak Benefit Society	Not stated	do.
*Architectural Assistant	Shanghai Municipal Council	300 Shanghai Taels per month	No date

Those marked with an asterisk (*) are advertised in this Number. *Contracts*, iv. vi. viii. x. *Public Appointments*, xix.

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TILES (*continued* —

	s.	d.	
Best Ruabon red, brown or brindled do. (Edwards)	57	6	per 1000 at rly. depot.
Do. Ornamental do.	60	0	" "
Hip tiles	4	0	per doz. " "
Valley tiles	3	0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 " "
Do. Ornamental do.	54	6	" " "
Hip tiles	4	1	per doz. " "
Valley tiles	3	8	" " "
Best "Rosemary" brand plain tiles	48	0	per 1000 " "
Best Ornamental tiles	50	0	per 1000 " "
Hip tiles	4	0	per doz. " "
Valley tiles	3	8	" " "

WOOD.

	At per standard. £. s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15 10 0	16 10 0
Deals: best 3 by 9	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0	0 less thn best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0 10 0	more than battens.
½ in.	1 0 0	"
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0
JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in.	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
" " 3 in by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	33 0 0	upwards.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
½ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1½ in. by 7 in. yellow, planed and matched	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot	0 11 6	0 13 6
1 in. by 7 in. white, planed and matched	0 12 0	0 14 0
1½ in. by 7 in. white, planed and matched	0 14 6	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ..	7 5 0
Compound Girders, ordinary sections	8 2 6 ..	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ..	8 17 6
Flitch Plates	8 5 0 ..	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ..	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	7 10 0 ..	8 0 0
Staffordshire Crown Bars, good merchant quality	8 0 0 ..	8 10 0
Staffordshire "Marked Bars"	10 10 0 ..	—
Mild Steel Bars	8 15 0 ..	9 5 0
Hoop Iron, basis price	9 5 0 ..	9 10 0
" " galvanised	17 10 0 ..	—
(*And upwards, according to size and gauge.)		
Sheet Iron (Black)— Ordinary sizes to 20 g.	9 15 0 ..	—
" " 24 g.	10 15 0 ..	—
" " 26 g.	12 5 0 ..	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ..	—
Ordinary sizes to 22 g. and 24 g	13 5 0 ..	—
" " 26 g.	14 5 0 ..	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	16 0 0 ..	—
" " 22 g. and 24 g.	16 10 0 ..	—
" " 26 g.	18 0 0 ..	—
Galvanised Corrugated Sheets— Ordinary sizes, 6 ft. to 8 ft. 20 g	12 15 0 ..	—
" " 22 g. and 24 g.	13 5 0 ..	—
" " 26 g.	14 0 0 ..	—
Best Soft Steel Sheets, 6ft. by 2ft. to 3 ft. by 20 g. and thicker	11 15 0 ..	—
Best Soft Steel Sheets, 22 g. & 24 g	12 15 0 ..	—
" " 26 g	14 0 0 ..	—
Cut nails, 3 in. to 6 in. (Under 3 in., usual trade extras.)	9 5 0 ..	9 15 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 0 0 ..	—
Pipe in coils	14 10 0 ..	—
Soil pipe	17 0 0 ..	—
Compo pipe	17 0 0 ..	—
ZINC—Sheet— Vieille Montagne ton	26 5 0 ..	—
Silesian	26 0 0 ..	—
COPPER— Strong Sheet per lb.	0 0 10½ ..	—
Thin "	0 0 11½ ..	—
Copper nails "	0 0 11 ..	—
BRASS— Strong Sheet per lb.	0 0 10 ..	—
Thin "	0 0 11 ..	—
TIN—English Ingots "	0 1 4 ..	—
SOLDER—Plumbers' "	0 0 6½ ..	—
Tinmen's "	0 0 8 ..	—
Plowpipe "	0 0 9 ..	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft.	delivered.
" fourths	1½d. "	"
21 oz. thirds	3d. "	"
" fourths	2½d. "	"
26 oz. thirds	3½d. "	"
" fourths	3d. "	"
32 oz. thirds	4½d. "	"
" fourths	4d. "	"
Fluted sheet, 15 oz.	2½d. "	"
" 21 oz.	3½d. "	"
½ Hartley's Rolled Plate	1½d. "	"
⅞ " " "	2d. "	"
⅛ " " "	2½d. "	"

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 8
" " " in drums	"	0 1 11
Boiled " " in pipes or barrels	"	0 1 11
" " " in drums	"	0 2 2
Turpentine, in barrels	"	0 3 8
" in drums	"	0 3 10
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	"	19 0 0
Best Linseed Oil Putty	per cwt.	0 7 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABBEYDALE.—For redecoration and general repairs, Abbeydale P.M. church and schools. Mr. J. P. Earle, architect, Norfolk-row, Sheffield:—

Alfred Machin, Sheffield £195

BIRKENHEAD.—For the erection of a stable and coach house, Rosebrae, Birkenhead, for Mr. C. Gent. Mr. J. H. McGovern, architect, Liverpool:—

Councillor Snape* £145

BLAENGWYNFI.—For supplying and laying 400 lineal yards of 6 in. c.i. socket pipes, Jersey-road, Blaengwynfi, for Glyncorrwg Urban District Council. Mr. W. P. Jones, Surveyor, Council Offices, Cymmer, Port Talbot:—

	Per ton.		Per ton.
E. Roberts	£5 5 0	Needham & Co...	£5 7 6
Thos. Spittle, Newport, Mon.*	5 4 6	C. Jordan	5 10 10
Hutchinson	5 15 0	Stanton Iron Works	5 1 6
Isca Co.	5 2 6	A. Stone	5 10 0

Laying.

	Per lineal yd.		Per lineal yd.
Rogers	0 3 0	Barnes & Chaplin, Cardiff*	0 2 0
Collins	0 2 6		

BOOTLE.—For alterations and additions to the Linacre Hotel, Linacre-lane, Bootle, for Mr. R. Scott. Mr. J. H. McGovern, architect, Harrington Chambers, 26, North John-street, Liverpool:—

General Contractors.—Broadbridge & Reid* .. £830 0 0
Additional Work.—Broadbridge & Reid* .. 229 10 0
Joiner.—W. H. Clark* 135 0 0
Joiner.—Tippin Bros.* 26 0 0
Electric Wiring.—Whipple & Co.* 12 10 0

BURY.—For hospital at Union Workhouse, Jericho, Bury, for the Guardians. Mr. A. Hopkinson, architect, 15, Agur-street, Bury. Quantities by architect:—

	1st Contract.	2nd Contract.	The Whole.
Charles Brierley	£21,539	£10,756	£32,295
John Inman	21,200	10,715	31,915
John Tinline	20,750	10,420	31,170
James Byrom*	20,699	10,440	31,139

[All of Bury.]

CHICHESTER.—For the erection of a shed, and paving and drainage works at Cattle Market, for the Corporation. Mr. T. Pym Jones, City Surveyor, Lion-street, Chichester:—

The Fireproof Partition Co.	£564 5 4	Boulton & Paul	£418 10 0
R. Cook & Co.	560 0 0	E. Turner	390 0 0
		W. H. Gamnon	382 7 0

FARNHAM (Surrey).—For the erection of new separation wards at the Workhouse, Farnham, for the Guardians. Messrs. Friend & Lloyd, architects, Grosvenor-road, Aldershot. Quantities by Mr. J. H. Hendrey, Frensham, Farnham:—

P. J. Caesar	£2,510	W. Smith	£2,260
Martin, Wells, & Co., Ltd.	2,490	Fergusan & Co.	2,255
E. Garland	2,369	Tompsett & Co.	2,250
G. Mardon	2,345	J. Harris	2,200
Mitchell Bros.	2,345	Crosby & Co.	2,171
Mussellwhite & Sapp	2,324	F. Knight	2,099
A. Chuter	2,289	Bateman & Sons	2,080
		G. Kemp, Aldershot*	2,045

[Architects' estimate, 2,123*l.*]

HARROGATE.—For main drainage work (contract 4, section 2) for the Corporation. Mr. E. W. Dixon, M.I.C.E., 5, Prospect-crescent, Harrogate:—

A. Braithwaite & Co.	£6,083	J. L. Hampton Mathews, Harrogate*	£3,763
J. Wilson & Sons	5,497	Wm. Morley & Sons	3,407
B. Firth & Co.	4,736	Hardy & Atkinson	3,383
A. Graham & Sons	4,700	Parker & Sharpe (withdrawn)	3,369
J. S. Dawson	4,293		
Wm. Brigg	4,228		
C. H. Dickenson	4,059		

HAYWARD'S HEATH.—For plastering Infirmary, and other work at Brighton County Borough Asylum. Mr. J. G. Gibbins, surveyor, 3, Palace-place, Brighton:—

Antill & Squires	£638 0 0	E. J. Kent	£418 0 0
George Nicholls	500 0 9	J. M. Parsons, Brighton*	397 2 0
A. & S. Wheater	495 0 0	Martin Reece	386 15 4
James Barnes	480 0 0		
Stephen Knight	469 17 0		

HEXHAM.—For 680 yards of pipe sewers, also tank and filters, for sewage disposal works at Farnley, Corbridge, for the Rural District Council. Mr. J. E. Parker, C.E., Post Office-chambers, Newcastle-on-Tyne:—

E. Henderson & Son, Ponteland £405 18 10

[There were five other tenders.]

HORSHAM.—For stabling, &c., for the Urban District Council. Mr. R. Renwick, Council's Surveyor:—

Wm. Roberts	£2,622	G. Potter	£1,795
Peerless-Dennis & Co.	2,146	H. Lindfield & Son	1,698
Box & Turner	2,015	Wm. Potter, Horsham†	1,680
Hillman & Murrell	2,009		
J. G. Pickard	1,880		

KENDAL.—For supplying, excavating, and laying about 227 yards lineal of 18 in., and 117 yards of 9 in. Clucas's patent pipes, &c., for the Corporation. Mr. R. Hampton Clucas, C.E., Borough Engineer. Quantities by Engineer:—

R. Woodburn	£626 4 0	W. Canadice, Kendal*	£547 13 7
H. W. Dixkin	625 3 6		

KINGSTON-ON-THAMES.—For erecting museum and art gallery for the Corporation. Mr. A. Cox, architect, 4, Adam-street, Adelphi, W.C.:—

Perry & Co.	£4,500	G. Kemp	£4,149
Potter Bros.	4,490	Holliday & Greenwood	4,147
C. E. Sims	4,392	Smith & Sons	4,123
W. T. Renshaw	4,347	Wisdom Bros.	4,114
Strange & Sons	4,259	T. Gough & Co.	4,090
Patman & Fotheringham	4,233	Leslie & Co.	4,072
J. Parnell & Sons	4,226	S. E. Moss & Co.	4,050
Speechly & Smith	4,190	B. E. Nightingale	4,049
T. G. Sharpington	4,188	J. Ferguson & Co.	4,000
P. & E. Davey	4,187	W. H. Gaze & Son	3,989
J. W. Brooking	4,179	John Appleby & Sons	3,974
Johnson & Co.	4,168	Frank Hawkey*	3,950
E. West	4,165	E. Chamberlain	3,886

LIVERPOOL.—For alterations to licensed premises 127, Stanhope-street, Liverpool, for Mr. F. Greaves Mr. J. H. McGovern, architect, Liverpool:—

Tippin Bros.* £180

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LONDON.—For the construction of new roads and sewers on Lord Westbury's Putney Hill Estate. Mr. J. C. Radford, engineer and surveyor, 163, Upper Richmond-road, Putney: —

S. Kavanagh & Co.	£9,960	W. R. Williams....	£9,743
B. Nowell & Co. ..	9,865	E. Parry & Co.* ..	9,561
Jos. Mears	9,780		

PONTYPRIDD.—For private street works, Parade and West-street, for the Urban District Council. Mr. P. R. A. Willoughby, A.M.Inst.C.E.:—

Charles Ash, Pontypridd* £636 0 0

PONTYPRIDD.— For 900 yards stoneware pipe sewer works, Pwllgwaun, Cilfynydd, and Hopkinstown, for the Urban District Council. Mr. P. R. A. Willoughby, A.M.Inst.C.E.:—

Charles Ash, Pontypridd* £330 0 0

PONTYPRIDD.—For (1) masonry abutments, fence, walls, and other works in connection with the reconstruction of Glyntaff Canal Bridge, Treforest; (2) supply and erection of steel work in connection with above bridge, for the Urban District Council. Mr. P. R. A. Willoughby, A.M.Inst.C.E.:—

Masonry Abutments, &c.

R. J. Mathias, Pontypridd* £396 0 0

Steel Work.

Gilbert Thompson & Co., Birmingham* 306 5 0

[12*l.* 5s. per ton.]

ST. AUSTELL (Cornwall).—For additions and alterations at Workhouse, for Guardians of St. Austell Union. Mr. J. Mutton, architect, Charlestown, St. Austell, Cornwall:—

Carpenter and Plumber.

A. Bennet* ..	£154 10 0	J. Knight & Son	£127 9 0
W. G. Behenna	129 10 0	A. Mably	126 15 0

Carpenter.

A. Bennet	94 0 0	J. Knight & Son*	63 0 0

Mason.

R. Richards....	88 0 0	T. Sanders	79 8 0
C. Clemo.....	86 13 0	J. Jacob*	77 0 0

Plumber.

A. Sovering	62 10 0	E. Francis &	
E. Stocker	60 9 0	Son*.....	51 12 6

[All of St. Austell.]

[Architect's estimate for total work, 190*l.*]

SCARBOROUGH.—For laying about 9,000 yards of wood block paving, and other work in connexion, in Westborough, Newborough, and Aquarium Top, for the Town Council. Mr. H. W. Smith, Borough Engineer and Surveyor, Town Hall, Scarborough:—

T. S. Starkey	£5,553 12 11
Improved Wood Pavement Co.....	5,334 10 9
Isaac Robinson.....	5,308 13 6
Acme Wood Block Flooring Co., Ltd.	4,850 14 8
Jas. Brunton, New Cross-street, Hull *	4,848 2 3
J. W. Pearce	4,685 19 10

SEASCALE (Cumberland).—For building a villa and boundary wall, &c., for Mr. F. W. Wrigley. Mr. James Tyson, architect, Seascale:—

J. Sharpe, Drigg Cross, Holmrook*.... .... £841

[Complete tender.]

SHERINGHAM.—For alterations and additions and drainage respectively for the Sheringham Golf Club (Contracts Nos. 1 and 2). Mr. T. Inglis Goldie, architect, Bank-buildings, Bank-plain, Norwich:—

Alterations and Additions.—Contract No. 1.

Blyth & Son..	£113 12 10	Sadler, C. A. ..	£95 0 0

[Architect's estimate, 100*l.*]

Drainage.—Contract No. 2.

E. J. Edwards ..	£228 8 11	T. & J. Burgoyne	£209 6 6
Blyth & Son ..	223 0 11	C. A. Sadler....	200 15 0

[Architect's estimate, 213*l.*]

STANLEY (Durham).—For sewage disposal works on the bacterial principle, West Shield-row, Stanley, for the Urban District Council. Mr. J. Routledge, Surveyor to the Council, Front-street, Stanley:—

No. 1 Contract.

Wm. Ayton & Sons, Blackhill* £2,897 15 8

No. 2 Contract.—Ironfoundry.

Smith Patterson, & Co., Ltd., Dunston* 588 14 5

SWINTON.—For deepening a well, &c., for the Swinton Urban District Council. Mr. R. Fowler, C.E., Engineer and Surveyor, Council Offices, Swinton, near Rotherham:—

J. Smalley ..	£452 12 6	J. T. Hymas ..	£182 6 0
R. D. Batchelor	375 17 0	T. C. Starkey	160 2 6
H. Brown & Co., Stourbridge*	190 18 0		

[Surveyor's estimate, 198*l.* 17*s.* 6*d.*]

SWINTON.—For making up Adwick-road and Spencer-street, for Swinton Urban District Council. Mr. R. Fowler, Surveyor, Council Offices, Swinton, near Rotherham:—

	Adwick-road.	Spencer-street.
J. P. Searle	£128 6 2	£289 17 5
B. Roberts	115 16 3	257 18 1
C. Green & Co., Rotherham*	105 7 6	245 2 4
[Surveyor's estimate	115 6 6	254 13 11.]

WHITCHURCH (Shropshire).—For the Alexandra Temperance Hotel. Mr. Walter Webb, architect, Bargates, Whitchurch:—

T. Pace	£2,874	John Corfield.....	£2,520
J. T. Jones.....	2,857	Richard Powell....	2,397
G. Bullock.....	2,677	George Edge	2,197
T. G. Huxley.....	2,600	G. Dodd & Son,	
Samuel Manley	2,625	Whitchurch*....	2,030

WICKLOW.—For sewers, Main-street, Ball-alley, Market-street, etc., for Wicklow Urban Council. Mr. J. Pansing, Town Surveyor, Church Hill, Wicklow:—

George Dixon	£610 10 0	W. Rose, Abbey-st., Wicklow*	£715 0 0
William Murphy	700 0 0		

[† Accepted on the recommendation of the engineer, whose estimate was 725*l.*]

WEALDSTONE.—For street works (Mason's-avenue, Herga-road, &c.), for the Urban District Council. Mr. H. Walker, C.E., Surveyor, Council Offices, Wealdstone. Quantities by Surveyor:—

	Mason's-avenue and Byron-road (Extension).			Herga-road.			Total.		
	£	s.	d.	£	s.	d.	£	s.	d.
F. Free & Sons ..	2,312	4	9	1,578	12	9	3,890	17	6
R. Ballard, Ltd...	2,204	0	0	1,487	0	0	3,691	0	0
A. B. Chapman ..	2,190	11	3	1,490	12	0	3,681	3	3
Thos. Adams....	2,177	17	5	1,480	6	5	3,658	3	10
F. Fowles	2,139	7	2	1,459	3	7	3,598	10	9
Henry Brown, Watford *	2,065	17	3	1,408	6	2	3,474	3	5

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The Builder.

VOL. LXXXVI.—No. 3180. JANUARY 16, 1904.

ILLUSTRATIONS.

Stockport Town Hall:—
Third Premiated Design } ..... By Mr. H. T. Hare, F.R.I.B.A.
View and Plans }
Houses, St. Felix Schools, Southwold ..... Mr. Arnold Mitchell, F.R.I.B.A., Architect.
An Artist's Cottage ..... Mr. W. A. Pite, F.R.I.B.A., Architect.

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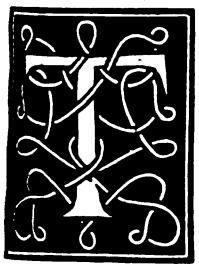
The Church of St. Nicholas, Witham.



THE ancient town of Witham, near the centre of Essex, on the main road between London and Colchester, near the junction of the river Guith with the Blackwater, is divided into two parts. The larger portion has by degrees gathered thickly on the margins of the old Roman road and more recent highway, whilst the smaller and older part lies half a mile to the north-west on pleasant rising ground called Chipping (or Cheping) Hill, where formerly the market and fairs were held and the chief business of the town transacted. It was here, according to the Anglo-Saxon chronicle, that a town was first built by Edward the Elder, son of Alfred the Great, in 913. The ramparts of this Saxon town, or burh, used to be well defined until the Great Eastern Railway Company drove their line right through the midst of it.

The old parish church of St. Nicholas stands near a small open green on Chipping Hill, on the right-hand side of the road that leads from Witham to Braintree. On the south side of the church there used to be considerable remains of earthworks, and much Roman brick or tile has been used in the fabric of the church, both in the nave walls and in the tower. There was certainly some small Roman settlement here, though the *Ad Ansam* of the Itineraries, which is sometimes placed here, was certainly north of Colchester.

When Stephen gave the manor and half hundred of Witham to the Knights-Templars, who had a commandery close by at Cressing, the church of Witham was exempted from the gift, as its advowson had already been granted by him to the royal collegiate church of St. Martin's-le-Grand, London. In the days of Eustace de Fauconbergh, Bishop of London from 1222 to 1228, a dispute arose as to the ecclesiastical rights of the Dean and Canons of St. Martin's over the church of Witham. It resulted in the rectory being assigned to St. Martin's, and a vicarage being formally ordained by the bishop in whose hands the patronage of the vicarage was placed. The taxation roll of 1291 shows that the rectory of Witham was then valued at 36*l.* 13s. 4d. and the vicarage at 10*l.* 13s. 4d. Although the patronage of this vicarage was left in the hands of the bishop, each vicar in the pre-Reformation days had to swear fealty to the canons, as rectors, in their own chapter-house at the time of his appointment. The dean and canons continued to hold the great tithes, and granges where they were collected, until 1502, when Henry VII. transferred the rectory to the great abbey of St. Peter, Westminster, and again in Elizabeth's reign to the bishopric of London.

A chantry was founded in this church, at the altar of St. John Baptist, in 1397, which was declared to be worth 6*l.* 14s. 10d. a year, in the time of Henry VIII. There was also another chantry in the church dedicated to the Blessed Virgin, declared to be worth 7*l.* 0s. 3d. a year. The vicarage was valued in 1535 at 22*l.* 6s. 4d.

Morant, in his "History of Essex," tells us that the top of the tower used to be of timber, but that it was raised with brickwork in the year 1743. He further says:—"This church may vie in neatness with most in this county, the sum of 314*l.* 8s. having been laid out upon it in repairs between the years 1701 and 1706 by the care and partly at the charge of Dr. Warley (the vicar), who collected 293*l.* 14s. 2d. among several gentlemen, and made up the rest himself." He also gave an organ to the church, but it was useless when Morant wrote in 1768.

The church consists of chancel, with north and south chapels and north vestry, nave with side aisles, south porch, and west tower. The earliest work now noticeable in the fabric is the south entrance, beneath the porch, and the archway from the nave into the tower, which dates from towards the close of the twelfth century, and is of the Transitional style. There are three shafts in the jambs, and the mouldings were chiefly zigzag or chevron. The archway into the tower is lofty and narrow and of massive character; though the archway is pointed, the great pilasters that bear it are semi-circular, and closely resemble genuine Norman work. These remains are sufficient to enable it to be said that a church of some size and importance, with a western tower, was erected here about the time of Richard I. We know that there was a church here at a much earlier date, and probably this Transition church was the successor to the far smaller one of the tenth century. Although there is no actual proof of a pre-Norman church at Witham, the assumption that there was one is most reasonable and probable. If the early town of Witham, built under the immediate direction of Edward the Elder, was of sufficient importance to interest the royalty of the day, and to obtain mention among the rare entries of the Anglo-

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St. Nicholas, Witham. Exterior.

Saxon chronicle, it is but fair to assume that a church for Christian worship would be erected for the use of the new fort and town. The exact entry, under the year 913, is as follows:—"Then went King Edward with some of his force to Maldon, in Essex, and there encamped, while the burh at Witham was being wrought and built." Is it not obvious from this—especially as we know that the burh of Maldon was not established or built until 920—that the King was merely tarrying at Maldon in 913 under canvas or in temporary shelters until the works at Witham were sufficiently advanced for him to take up his residence and move his troops there? And that being the case, is it not almost a certainty that a Christian place of worship, however humble, would at that time, or soon after, be founded?

About a century later, probably in the earlier part of the reign of Edward I., the church underwent a thorough reconstruction. The arcades of four arches on each side of the nave, with their columns and responds of four clustered shafts, are of this period, as well as the four western circular clearstory windows, two on the north and two on the south; the four eastern square-headed clearstory windows, of two lights with cinquefoil heads, are of the fifteenth century.

On the north side of the chancel is an interesting mediæval vestry, which should be compared with the one in a like situation in the church of the not far distant town of Braintree. This vestry has had two stories, but the floor of the upper one has gone. The stone newel staircase to the upper room is still extant in a small turret at the north-west angle. There are three square-headed, widely-splayed windows in the upper walls. In the sill of the east window of the basement there have been built in a few old encaustic tiles found in the restoration of 1877. The most interesting feature about this vestry is the doorway out of the chancel. In the hollow of the moulding (on the chancel side) are small well-cut flowers, alternately square and round. The date of this vestry, though altered afterwards, seems to be of the time of Edward I., though possibly a little later. Most likely it came somewhat after the building of the present nave arcades, for the chancel would be in the hands of the canons of St. Martin's for repair or rebuilding, and would not necessarily be rebuilt at quite the same period.

The walls of the church are for the most part of pebbles and flints, with stone quoins, and having a liberal intermixture of Roman tiles and mediæval bricks in the north wall of the nave. But the structure of the vestry is different; the walls in this case are formed of irregular-shaped stones of varying size. Most of these stones have obviously been used in some previous building; there are no traces on them of Norman axeing, and it is at least possible that we have here some of the materials of the first pre-Norman church.

The south porch of the nave is a fairly good example of work towards the end of the fourteenth century, probably of the reign of Richard II. There are two large traceried windows, not glazed; the tracery has been renewed, but on the old lines. The roof is flat, and there is an embattled parapet and two large gargoyles. Over the inner doorway is inscribed, "Samuel Cardel, Churchwarden, 1700," which probably gives the date of a roof renewal.

There is a blocked-up north doorway into the north aisle, just opposite the south entrance; it appears to be of the same date as the south porch.

The western tower stands well, and is of three stages. The walls are a composition of pebble and brick. There is a new turret for stairs up to the first stage in the north-east angle; large angle buttresses reach up to the second stage; the west doorway is of the same date as the south porch and north doorway of the nave, with a two-light late decorated window above; the second stage has trefoil-headed single lights; the third stage has two-light bell-chamber windows that harmonise with the rest, and the top is embattled.

The church underwent very considerable restoration in the year 1877, when about 2000*l.* was expended. A large proportion of this money was spent on the tower, when the uppermost stage (built of brick in 1743) was entirely renewed. Two of the bells were at the same time recast, and the galleries removed and much reseating done in the body of the church.

Most of the present windows of the body of the church have been renewed, and follow the style of the latter half of the fifteenth century, except the window in the east bay of the south aisle, the casing of which is of fifteenth century date.

On the south side of the chancel is a two-arched arcade into the south chapel. This arcade and the arch out of the south aisle, together with the windows and the small south doorway, are of late fifteenth or quite early sixteenth century date. This building probably corresponds to the founding or refounding of the gild or chantry of the Blessed Virgin, for this was the Lady Chapel. On the north side of the chancel, to the west of the vestry, is a wide Tudor arch opening into a chapel now used as the organ chamber. The altar of St. John Baptist was on this side of the church.

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St. Nicholas, Witham. Interior.

The upper doorway on to the rood loft (fifteenth century work) is on the north side of the chancel archway. Below it is another doorway, now blocked up, which looks at first (though of an unusual width for such a purpose) as if it must have served as the lower doorway to the rood stairs. But on going round into the north chapel it becomes manifest that the true lower doorway to the stairs is on that side; the larger opening on the nave side was probably a disused comparatively modern contrivance for reaching the pulpit.

On the south side of the altar in the chancel is a shallow, square-headed piscina niche with stone credence shelf; on the north side is another trefoil-headed niche. In the Lady Chapel is a good late piscina niche with a cinquefoil head; it still retains a wooden credence shelf, an unusual occurrence.

As to the woodwork of the church, the lean-to roofs of the aisles, with tie-beams, are worth noticing, as much of the timber and construction are old. But the exceptional feature of the woodwork of the church is a pair of low wooden sedilia of substantial make and of late thirteenth century date. They stand within the altar rails on the south side, and this, we believe, is their approximately right place, though originally they were combined with other woodwork or wainscotting. "Murray" has been called to account by some for terming these seats "sedilia," as it has been supposed by others that they are only parts of a series of choir stalls, and that wooden sedilia for officiants at Mass were unknown; The use of obviously wooden sedilia, very much after the fashion of those at Witham on the south side of the altar, has recently been clearly shown in the old sixteenth century Flemish plates to the "Booklet of the Mass," which has just been issued to the members of the Alcuin Society.

Under the chancel arch is a good fifteenth century rood screen, with three openings on each side of the doorway. The style is somewhat unusual, and corresponds to that at Worstead and one or two other Norfolk screens; each opening has an ogee curved arch of cusped tracery some little way below the enriched head. The wood canopy work on the west side of the screen is a recent renewal.

The door in the doorway into the north vestry out of the chancel is original; the central closing-ring is a good piece of iron work. The doors of the south entrance of the nave have some fifteenth century tracery carving about them. The small door into the Lady Chapel bears on the outside, "1632, George Ormond."

In the vestry is an old chest with three handsome locks; the woodwork is uncarved, but it is probably of fourteenth century date. On a shelf in the vestry are four funeral helmets, two with spikes for carrying crests; they seem all to be of the sixteenth or possibly early seventeenth century.

As to the monuments of the church, there is one that is of older date than any part of the extant fabric. This is a slightly coped coffin slab with cross patée at the head; it has been sculptured throughout, but is much worn; it is of early twelfth century date, and now stands at the east end of the north aisle.

In the north chapel behind the organ is a fine monument of its class to John Southcotte and his wife. This John, who became a distinguished lawyer, was a younger son of a Devonshire family; he purchased the manor of Little Witham, *alias* Powers Hall, in this parish. He was created a Serjeant in 1558 and one of the Justices of the Queen's Bench in 1562. The monument consists of a table tomb, on which rest the two stiffly-arranged recumbent effigies. The judge—a valuable example of the exact judicial costume of the day—wears his official fur-lined gown and circular tippet; round the neck is a ruff of modest dimensions, and on the head a round flat Tudor cap, of much the same pattern as that now used by a Cambridge LL.D. The effigy of his wife, Elizabeth, daughter and heiress of William Robins, of London, is arrayed in a close-fitting gown or dress, and over it a loose robe with open sleeves; at the neck and wrists are small ruffs, and the hair is brushed back and surmounted by a flat pointed cap. Both figures have their hands joined in prayer, and their heads resting on cushions with embroidered borders. The south side of the tomb, the only one exposed, is divided into two panels bearing a quartered shield of Southcotte, and the like quarterings impaling Robins. There is another shield of Robins at the east end. The cornice moulding is exceptionally bold. On the jamb of the window above

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the tomb is a good architectural tablet, with the Southcotte arms surmounted by helm and crest, and surrounded with well-designed mantlings. The inscription tells of the death of the judge in 1585, aged seventy-four. By his wife he had thirteen children, only three of whom survived him. Sir Edward Southcotte, the fourth in descent from the judge, sold the Witham property to Sir Nicholas Garrard. The two effigies are in fairly good preservation, save that the noses of both have been broken; the faces were evidently intended for portraits.

Over the doorway into the vestry, on the south side of the chancel, is an interesting monument of the important family of Nevill. It is to the memory of Mary Nevill, only daughter and heiress of Sir Thomas Nevill, of Holt, co. Leicester, by Clara, daughter and co-heiress of Ralph Nevill, of Thornton Brigg, Yorks., and to her second husband, Francis Hervey. It is set forth on the monument that she was first married to Thomas Smeethe (a curious variant in the spelling of Smith or Smyth), second son of Sir John Smeethe, Baron of the Exchequer, who died in 1564, and was buried at Cressing; by him she had five children. She was married secondly to Francis Hervey, a son of John Hervey, of Ickworth, Suffolk. The inscription describes her second husband as one of the honourable band of gentlemen pensioners to Queen Elizabeth, and states that he kept house, in worshipful estate and credit, for twenty-seven years at Cressing. The lady died in 1592 and Francis Hervey in 1593. In the centre of this mural monument, supported by an ornamental corbel and panelled pedestal, are the kneeling figures of Francis and his wife, facing each other, with a double prayer-desk between them. The esquire is in late plate armour, with bare head and short beard; the lady is in a loose flowing robe or gown, with flat cap and hair drawn back. On the desk are the quartered impaled arms of the two distinguished families; above it is the long inscription. The figures are flanked by two panelled pilasters supporting a handsome entablature, with pyramidal terminals over each pilaster, and the marble achievement in a medallion in the centre. The whole, though too high up for close observation (it has probably been moved), is a characteristic and good example of small mural monuments of this kind, which might perhaps with advantage be revived.

On the chancel floor, near the entrance to the vestry, is a large stone showing the matrices whence a series of brasses of apparently fifteenth century date have been wrenched; they included figures of knight and lady, two groups of children, four shields of arms, and inscriptions.

Another marble mural monument quite worth noting for the exceptional purity and grace of the lettering is to the memory of the Rev. George Lisle, Rector of Rivenhall (1687), and Anne, his wife (1696); above the tablet are the arms (three double-headed eagles displayed), well arranged after an effective late Renaissance method.

On the floor of the chancel is a nearly obliterated inscription to John Lindsell, Bishop of Colchester; he was the second suffragan Bishop of Colchester appointed under the Act of 26 Henry VIII., c. 14. He was instituted to the vicarage of Witham in 1528. There are also memorials to two Archdeacons of Colchester, who were also vicars of this parish—Jonas Warley, D.D., who died in 1722, and Joseph Jefferson, who died in 1821.

Just within the chancel arch, on the south side, is a nineteenth century mural monument of white marble, which should not be overlooked; it has some merit of its own, but is chiefly remarkable for the pathetic romance attached to the death of the two whom it commemorates. Those who know the beautiful Lac de Gauve, high up in the Pyrenees above Cauteret, will remember the monument surrounded with iron railings standing on a rocky little peninsula that juts out into the waters at the foot of the lake near to the pathway by which it is reached. Here on Witham chancel wall is repeated the sad story there also recorded. William Henry Pattison (of Witham), aged thirty-one, and his wife Sarah Frances, aged twenty-six, were married on August 22, 1832, and were drowned in the Pyrenean lake on September 20. They were brought back home for burial. A medallion in bas-relief on the monument represents with some accuracy the outlines of the mountains and the lake, and shows an angel carrying the two souls to Heaven.

The church, which finds accommodation for about 600 worshippers, is well seated with modern oak, and has some fairly good oak stalls in the choir and a well-carved pulpit. The octagon font is modern.

NOTES.

Exploration in Asia Minor. THE idea of a new impulse being given to archæological research in Asia Minor, which was the subject of a paper by Professor Ramsay, read at the Hellenic Society this week, is one which must be of the greatest interest and promise to all students of architectural history. The exploration of that great tract of country, which may yet reveal we know not what of remains of early forms of classic architecture, has hitherto been but partial and intermittent, as far, at all events, as this country is concerned. Professor Ramsay said that in urging a renewal of English interest in Asia Minor he did not mean to advocate rivalry, but rather co-operation, with the explorers of other countries. He suggested the establishment of a summer school of exploration in Asia Minor, and the establishment of centres for reference and information in some of the powerful cities. The English Government, of course, will furnish no funds for such work, but we hope the scheme may be carried out notwithstanding.

The Fall of a Viaduct. As the result of a Board of Trade inquiry following the collapse of a viaduct on the Great Western Railway in November last, the opinion is formed that the failure was chiefly brought about by the use of a steam crane on the arch which first gave way, and which, it is now stated, was not sufficiently backed up in the haunches. The other contributing cause is said to be found in the fact that the mortar was not sufficiently set. We may here explain that the crane was only used upon the arch while the centring was being lowered, and that during the raising of materials it was placed over the adjoining pier. It may possibly be the case that the separation of the rings was brought about chiefly by the working of the crane, but we still believe that the condition of the mortar was a most important factor. The crane had previously been used on nine other arches for removing the ribs, of which fifty-four were lifted out without mishap. Consequently we may fairly argue that if the mortar in the tenth arch had been sufficiently set, there would have been no collapse, in spite of the crane. Taking this view, the obvious moral is that if people insist upon using lime mortar for bridge building, they must give it adequate time to set, even at the risk of delaying operations in wet weather. Accepting the conclusion stated in the report, we have the equally useful moral, never to use steam cranes, or to place heavy loads of any kind, on recently-built arches. Whichever way we look at the matter, we see reason for the greatest caution in dealing with newly-built arches, especially when lime mortar is used.

Ancient Lights. THE subject of ancient light, or, more correctly, the easement of light, has suddenly found itself discussed in the *Times*. Some owner of a servient tenement, who found himself inconvenienced by the existing law, gave vent to his feelings in our contemporary; he has found some supporters and also some adversaries. The correspondence, however, is not likely to have any practical results. That the existing law does in many instances work unreasonably cannot be doubted, and the only remedy for such unfairness is that which has been consistently advocated in these columns, that the courts should in all cases award damages where the easement of light has been infringed, in place of an injunction. At the present time the owner of a dominant tenement can prevent the owner of the servient tenement from building unless he pays him any price for the right so to do. He places a pistol at his head in the shape of an injunction, and says in effect, "No building or my price." If, however, the courts of law awarded damages based on the actual diminution in value or convenience of darkened buildings, then only a reasonable sum would have to be paid. The diminishing of the light of a building to a degree to lessen it in value, but still to leave it useful for purposes of business or habitation, is a different thing from darkening it so as to make the whole building useless or unhealthy, in which case the question of municipal regulations necessarily comes into play.

Tramways and Street Traffic. THE evidence of Mr. Sellon before the Royal Commission on London traffic contained much food for thought, even if exception be taken to his view of the question as a whole. Mr. Sellon, who is the late chief engineer to the British Electric Traction Company Limited, is naturally a strong advocate for tramways and especially for electric tramways. Comparing horsed tramways with omnibuses, he estimated considerable advantages in

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favour of the former, both in saving horses and in cheapness of running; and electric tramways, he asserted, could cope with 50 per cent. more traffic than that now existing without any increase in the number of vehicles using the road. That tramways can carry a larger number of passengers more cheaply and expeditiously we are not prepared to dispute; but in an old city like London, where the thoroughfares are narrow and not constructed with a view to such traffic, tramways dislocate the general traffic far more than other kinds of vehicles. Wide streets are a necessity where tramways are to be used, and wide streets in the congested areas of London are an impossibility. That portion of Mr. Sellon's evidence which was directed to show how private enterprise and improvement in tramway systems have been hindered by the powers granted to the local authorities is well worthy of attention. A more concrete example of the pernicious influence to be expected from municipal interference and competition it would be hard to cite. The fact that private lines are subjected to the possibility of compulsory purchase at the end of short periods is a clog on enterprise which, if it had existed in the early forties, would have deprived us of our railway system.

Motor-Car Speeds.

THE warning given by Lord Lindley to motorists in his charge to the grand jury at the Norfolk Quarter Sessions comes at an opportune time. The former Master of the Rolls pointed out that the Act was not intended to legitimise a speed of twenty miles an hour in all circumstances, but that the speed was really governed by the important provisions against reckless and negligent driving to the danger of the public. Now, it is common knowledge that many motorists are disposing of the cars they have hitherto used because they are incapable of attaining a speed of twenty miles up hill, and are purchasing cars with a greater horse-power to attain that speed up hill. They maintain that they have a grievance in this under the new Act, because they have hitherto made an average by going at greater speed on the level after hill climbing at a low speed, and assert their intention of now maintaining an average of twenty miles. The remarks of Lord Lindley may save these rash spirits from incurring much unnecessary expense. In this connection we may also call attention to some interesting experiments made with the new numbers, which have been proved to be illegible at speeds of thirty miles an hour. We assume that driving at such a speed as to render the number indecipherable would also in itself be an offence against the Act.

Marylebone Electric Lighting.

THE opponents of municipal trading have for the last year been holding up the electric lighting deadlock in Marylebone as a sample of what can happen when municipalities engage in undertakings for the "welfare" of the ratepayers. Yet when the facts come to be examined it will be found that the Borough Council are not so incompetent as their opponents would have us believe; and the record of the Metropolitan Company from the consumer's point of view cannot be described as good. It will be remembered that the Borough Council agreed to purchase the Marylebone portion of the Supply Company's undertaking, and in this they had the consent of Parliament. The value of the undertaking down to December 31, 1901, having been referred to arbitration, was fixed at 1,212,000*l*. It was only when the Borough Council applied to the London County Council for a loan of 1,274,000*l*. that trouble arose. This application was rejected on highly technical grounds, and the Board of Trade upheld this decision. Mr. Justice Buckley was justified in saying that the Borough Council ought to have thought of all this before they came under statutory liability to purchase. We think that to a reasonable extent they did. What they did not foresee was the wholesale depreciation of municipal stocks, making it practically impossible for them to borrow at much less than four per cent. In order to borrow they must have the sanction of Parliament and the consent of the ratepayers. Judging by the circular issued by the Ratepayers' Committee, it seems possible that they may not get this consent at the meeting convened for the 19th inst. The ratepayers, however, will be very ill-advised if they refuse to consent to the Council's present Bill, and at the same time will not take into consideration the offer of terms made by the company. This offer seems to us to be very disadvantageous to the ratepayers. It virtually amounts to asking them to pay 12,300*l*. a year for twenty-six years in order to get them out of the bargain. We think that most consumers would prefer the municipality to take up the supply.

All Hallows, Lombard-street.

FROM a paragraph in the *Times* of the 9th inst. we learn that Canon Pereira has been presented to the rectory of All Hallows, Lombard-street, with a provision, the motive of which we do not quite understand, that the endowment connected with the church is to be used as a stipend for the Bishop of Croydon, "and so for the promotion of church organisation in the diocese." The presumption is that All Hallows will remain *in statu quo*, and that the new rector is able to be independent of the endowment. We notice the matter mainly to comment on the remarkable terms of the paragraph, in which, referring to the fact that the church had been condemned to be demolished, it is sneeringly observed that "the antiquaries and others succeeded in beating up a sufficient number of the ratepayers to defeat the scheme," and that the ecclesiastical authorities, in parting with the endowment, "have at least shown less selfishness than the majority of the All Hallows vestry." So that it appears that, in the eyes of the *Times*, or of the person who wrote the paragraph (which has all the appearance of being a partisan statement), the joint action of a number of "antiquaries and others" to prevent a fine church of Wren's from being destroyed is only regarded as "selfishness"! It is an idea only too characteristic of the spirit of English newspapers in these matters.

Royal Academy Lectures.

AT the first of Professor Clausen's six lectures to the Royal Academy students on Painting, on Monday last (when there was a large attendance of visitors as well as students), he lectured on "Some Early Painters," more especially Fra Angelico and Masaccio. He commenced his lecture with some general remarks on the state of painting in the present day in comparison with the early Renaissance period—the want of definite aims, owing in part to the almost bewildering amount of our present knowledge of all schools of painting, and the much larger field over which the history and criticism of painting had to range compared with the days of Reynolds's lectures, when hardly anything was known or thought about the primitive Italian painters; incidentally observing that William Blake might be said to have been the first pre-Raphaelite, as he first expressed an admiration for the directness of aim and careful execution of the early painters. Professor Clausen also referred to the great care and finish of execution of the early painters, not merely in isolated instances, but as a practice pervading all their works, a quality of which there was but little to be seen in modern painting. Exhibiting on the screen some examples of Fra Angelico, he drew attention to their childlike simplicity and directness of expression and composition, and their idealised representation of events, as if they represented a vision in the painter's mind of the event, rather than an attempt to realise it in a materialistic sense. The original pictures showed a great deal of beauty of colour and a remarkable clearness of effect resulting from the ignoring of shadow—"when painters begin to see shadows, then their troubles begin." Masaccio's works represented the earliest examples of realistic painting and the power of drawing the figure in perspective in a three-quarter view, instead of the simple side or front view usually shown by Angelico. Some illustrations of Masaccio showed forcibly the gulf which separates him in this respect from Angelico; the figures of Adam and Eve in "The Expulsion" were as well drawn as they could draw them in the Life school to-day. Masaccio's paintings in the chapel of the Carmine must have been drawn without any models before him, for there was no space or light for models: they must have been studied and rehearsed beforehand and then drawn from memory. That was a useful lesson for modern students, who should try to acquire the power, not only of drawing what they saw before them, but of carrying it further in the memory. The remaining lectures, on the succeeding Mondays and Thursdays (the second of which will have been delivered before this issue is published), are on "Lighting and Arrangement," "Colour," "Titian, Rembrandt, and Velasquez," "Open-air Painting and Landscape," and "Realism and Impressionism."

Mr. Garstin's Drawings

AT the Fine Art Society's Gallery is a collection of water-colour drawings by Mr. Norman Garstin, "In Border Lands," illustrating scenes in Normandy, Brittany, and Holland. Mr. Garstin has a style of his own in water-colour, and there is a

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great deal of feeling for both colour and composition in his drawings; they are artistic work, and not mere topography; but where architecture predominates in the subject the rather soft and woolly texture of his work is not satisfying to the architectural eye, and the buildings are rather carelessly treated in detail. For instance, "At the Foot of the Garden, Caudebec" (35), which as a whole is a work of very good pictorial quality, the careless drawing of the cathedral in the middle distance is a weak point in the picture. Those which are purely landscapes are the best. "A Green Alley by the Seine" (23), full of sunlight; "La Bouille, on the Seine" (29); "Evening by the Vire, St. Lo" (36), with the house beneath a dark mass of trees and reflected in the stream; "A Reach of the Rance" (43), a very small and charming little upright landscape; "Summer Evening, Holland" (49), with the long row of tree-trunks reflected in the water; "A Bend of the Seine" (64); "A Water Gate by the Ellé" (76); and "A Home Upon the Waters, Holland" (80), with the large heavy barge and its immense rudder, in yellow light, in the centre of the picture. There are two little experiments in working pictures by stencil, of which "Greeting" (92), a kind of New Year's card, is very successful.

Old Glass Colour Prints.

AT the Leicester Galleries there is on view (and on sale) a collection of curiosities, the property of one owner; a number of colour prints on glass; an old fashion of work which has long since died out, and which, to judge from this collection, the world can very well spare. They are apparently produced by a process of taking off the colour of a print on to the back of the glass, so that it shows in front as a colour print, with a glazed surface. There appears to be an attempt to get up a fashion for collecting these, which may, like other fashions, have its day; but they are worth nothing in an artistic sense. As an illustration of the taste of some of our ancestors they have, however, a certain archæological interest.

The late M. Gérôme.

THE death of M. Gérôme removes from the world a great and most typically French artist—French in his class of subjects, in his feeling, and in his conscientious execution and thorough knowledge of his craft; the latter, perhaps, a characteristic more of the past than the present generation. Owing to a certain apparent lack of poetic feeling—and, it must be admitted, that tendency towards the choice of cruel or unpleasant subjects which seems a besetting sin of French artists who have Orientalised themselves—his works cannot be said ever to have appealed to what is highest and best in human nature. But his art is of great intellectual interest for its power and mastery, and he was a fine and chivalrous character, beloved by his pupils and followers in spite of his relentless criticism. It has been said that "pas mal" was the most enthusiastic approval that anyone in his atelier ever obtained from him; and possibly it was the highest praise that he passed on his own productions. Some further notice of his life and work will be found under the head of "Obituary" on another page.

Literary Criticism on Art.

MR. EDMUND GOSSE'S speech in proposing the health of M. Rodin, at the dinner given to the eminent sculptor, affords an amusing example of the truth of a remark made to us by an English sculptor the other day, that M. Rodin had been exalted into his present position "by a group of hysterical literary men." Mr. Gosse remarked that "we used to think of sculpture as an art in dignified repose; but we turned to M. Rodin and saw torture and ecstasy, languishment and terror—all the primal passions of our race—quivering on the surface which enveloped the vehement creation of his dreams." And then Mr. Gosse groups M. Rodin, by implication, with Pheidias, the most reposeful sculptor that ever worked. "With astonishment and joy we saw him labouring in the refulgence of the uncreated image, while his soul was visibly torn with agony until he could bring his vision to birth." At this rate, M. Rodin at work must, indeed, be a remarkable sight. This journal was one of the very few which recognised M. Rodin's gifts many years ago, when he was almost unknown in this country; but hysterics of the kind in which Mr. Gosse indulges can only serve to make both literature and art ridiculous in the eyes of sane-minded people. We may add that it is not many years since the same discerning critic wrote an almost equally excitable magazine article in praise of a producer of Bible pictures in clay, whom Mr. Gosse (then) maintained to be the greatest sculptor of the day. Now the mantle has descended on M. Rodin.

Institute Prizes Competition.

THE list of works received in competition for the various prizes and medals given by the Institute of Architects is just published, with a list of the mottoes under which works were submitted, and it looks as if this year's competition would be a good one. We are glad to see that the Essay Prize, on the attractive subject "The Delineation of Architecture," has attracted eight competitors—a much larger number than usual. There are twelve competitors for the Silver Medal and ten guineas for measured drawings of ancient buildings; fourteen for the Soane Medallion, "A University Theatre on an Open Site"; and eleven for the Tite Prize, "Design (according to the principles of Palladio, Vignola, Wren, or Chambers) for a Crescent in a Large City." Both these are very attractive subjects, and we hope will have produced some fine designs; but surely the wording of the Tite subject is rather inaccurate in the use of the word "principles"; it should have been "according to the practice" of one or other of the different architects mentioned. Their principles were much the same; their practice in the treatment of the Order differed; but that is not a sufficiently large and vital difference to define as a principle. The Grissell Medal, also an attractive subject—"Design for a Timber Spire or Lantern Termination to a Tower"—has attracted fourteen competitors, which we are very glad to see, as this useful prize for practical construction has been rather neglected. The other prizes are: The Arthur Cates Prize, four competitors; the Owen Jones Studentship, applications and drawings from five competitors (Messrs. W. Davidson, L. R. Guthrie, James M'Lachlan, F. Lishman, and H. Morley); the Godwin Bursary, two applications, from Mr. H. Phillips Fletcher and Mr. F. R. Hiorns; and the Pugin Studentship, three sets of drawings, from Messrs. A. E. Bullock, W. S. A. Gordon, and F. C. Mears. This usually very popular prize seems to be exercising less attraction than formerly.

The President's At Home.

THE President's smoking reception at the rooms of the Institute of Architects on Monday evening was, as far as one could judge from the appearance of the room, the most largely attended of any. At each of these receptions there has been a collection of drawings by a late eminent architect on the walls; on this occasion it was J. L. Pearson who was represented. His drawings of vaulting and other details of work in the mediæval style were very interesting, and showed how practically he had grasped the process of mediæval architecture. Yet it cannot be denied that there was about them an air of being out of date for architects of the new generation; in Wordsworth's phrase, they "speak of something that is gone."

THE INTERNATIONAL SOCIETY AT THE NEW GALLERY

ART used to be so supposed to be concerned with the production of the beautiful; at the exhibition of the so-called "International" Society of Painters, Sculptors, and Gravers at the New Gallery it seems to be largely concerned with the production of the ugly. Such pictures as M. Zuloaga's "Un Mot Piquant" (162) and "Gitane et Andalouse" (174), Mr. Ricketts's "A Burial" (179), M. Vierge's "Etude de Berger Espagnol" (200), M. Anglada's "Danse Gitane" (232), and, worst of all, M. Maurer's "The Dancer" (230) are enough to make one think the art of painting an altogether pernicious machinery for defacing canvas. M. Rafaëlli's portrait (246) of a young lady in white, which would ordinarily pass for a pretty, but not very powerful or original, picture, comes as a positive refreshment after some of the things in the same room, from the mere fact that it is not ugly. Even a painter like M. Cottet, who has produced some fine pictures, seems to have got infected with the atmosphere of the place; his "Deuil Marin" (136), meant to be pathetic, with its three hardly-painted bloodless figures looking as if they were cut out in silhouette, is almost entirely devoid of pictorial quality. He is better in the "Messe du Matin" (148), which was, we think, exhibited in the New Salon, or one on very much the same lines.

Apart from absolute and defiant ugliness, there are such a number of pictures, especially among the smaller ones, the object of which seems to be to represent a figure, an incident, or a scene in some unusual, unexpected, or unreal manner—the craze for what is supposed to be originality at all costs. Architecture, among other subjects, suffers badly in such efforts as Mr. Bauer's "Amiens Cathedral" (94), a muddy scrawl rather than an architectural drawing, and M. le Sidaner's "The Portail" (180; he seems to have mixed French and English in the title), which looks like a brush drawing of architecture on blotting paper, with all the outlines and details run into a smudge. There seems to be no presiding principle in the exhibition after all, for M. Raffaëlli's plain prose portrait, already referred to, looks as if it had no business there; and at

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the top of the north gallery, in the central position, hangs M. Claude Monet's well-painted and well-balanced realistic interior scene, "Le Dejéuner" (218), representing nothing of the poetry or idealism of art, but which in its honest, unaffected style and execution is a condemnation of much of the work exhibited in the same room.

The most important department of the exhibition is the central hall, in which the sculpture is arranged. It is difficult to realise how the work of M. Rodin there grouped would really have struck one if the mind were not almost set against it by the thoughtless and over-wrought adulation at present poured out upon everything that he does, by art critics and literary enthusiasts who seem to have no power of individual judgment, but simply follow in the same rut like a flock of sheep. The colossal figure "Le Penseur" is a fine thing with a rugged vigour about it, though it does not specially suggest thought, as Michelangelo's wonderful figure does; the "Bellona" head is a remarkable conception, but the expression suggests Bellona sulky rather than vengeful and dangerous. The small bronze group "A Dream" is a pretty and poetic fancy, somewhat resembling in sculpture some of the ideas which Mr. Henry J. Stock has endeavoured to express in painting. On the other hand, we have one group (not named in the catalogue) in which two figures are twisted and contorted together so that you can hardly make out which limbs belong to which, and with that peculiar mode of execution which M. Rodin has recently adopted, as if the thing were in a half-melting state and running soft; and, to crown all, we have a bronze of a nude John the Baptist without a head. This whim of sending to an exhibition limbs and parts of figures, and headless figures, and figures carved in different fragments and then visibly skewered together (we are spared this latter amusement, at all events, in the present exhibition) is simply a piece of affectation, as if the public were to take thankfully any fragment of a figure which the great master chose to set before them—a disrespectful proceeding, in which the sculptor is encouraged by the infatuation of the critics and the public.

Among the other works in sculpture are several by M. Bartholomé, the author of the "Monument aux Morts," a far greater work than anything M. Rodin has produced, but the very existence of which is unknown to most of the English adulators of the latter. There is nothing here quite worthy of the author of the "Monument," but there is a deep pathos in the strange "Le Réveil dans la Mort," husband and wife and infant child becoming momentarily conscious of each other's affection in the tomb. His "l'Enfant Mort" is a pathetic group of fine sculptural line. M. Bartholomé's success in giving expression to the two wonderful figures with their backs to the spectator, in the doorway in the "Monument," has apparently led him to try this effect where there was less motive for it, as in his group "Le Secret," which is a little too like a joke in sculpture, and the "Petite Fontaine d'Encoignure," which, however, is a pretty fancy; a nude figure is faced inwards in a niche under the shell basin above, and the fountain water would, as it overflowed, run down her back, or else would make a watery veil before the figure. Among other pieces of sculpture in the central hall may be mentioned a capital small bronze group of "Tiger and Wild Boar" by Mr. J. H. M. Furse, and a fine life-size sketch of a head, "The Bard," by Mr. Taubman.

Among the pictures which are of any importance are Sir James Guthrie's portrait of a child (168) in the west room, a welcome contrast to some of the portraits there, and Mr. Lavery's "A Lady in Pink" (181), a brilliant and effective piece of colour. The same room contains Whistler's full-length portrait entitled "Rose et Or" (153), stated to be "unfinished," but not more manifestly so than many pictures of his which do not bear that legend; and two real pictures by the same unequal artist, "Symphony in White" (152) with two figures, a beautiful piece of delicate colour, and "Valparaiso" (154), a pearly-grey morning scene in a harbour; true, the water is not like water, but the general effect is very beautiful, and one can only wish that Whistler had always painted like this. In the north room Mr. Bertram Priestman shows, in a large landscape, "The Lock Pool" (192), an obvious intention to challenge Constable on his own ground; owing to the glass, the picture is difficult to see, but it looks a fine one, only wanting, it seems to us, a touch of high light here and there, to prevent it looking too sombre. Still, this is a serious work of high intention. Mr. Millie Dow's "Eve" (192) is not worth the title, being no more than a pretty and rather sentimental nude study. M. Claus's two studies in light and colour, "Matin" (207) and "Azaleas" (220), are real works of art, though in a somewhat far-fetched manner, and Mrs. Withers's "White House by the River" (216), a very "dirty white" house, has a certain melancholy power about it, as also Mr. Withers's "The Bridge at Moret" (159). Mr. James Paterson's "Edinburgh Castle" (247) is a really fine work, with a remarkable effect of scale and aerial tone in the painting of the ancient castle high up in the picture. In the south room are a considerable number of works in black and white, including, we are glad to see, a row of Mr. Timothy Cole's beautiful wood-engravings; charcoal drawings by Mr. Pennell; a number of etchings, colour prints, and lithographs by M. Felicien Rops, unequal in interest, but containing a good deal that is very clever, both in respect of execution and suggestion; and a casket in gold, silver, enamels, and precious stones by Mr. H. Wilson.

COUNTRY HOUSES.*

THERE is something very attractive about the country house, and its whole environment and surroundings appeal strongly to the imagination. It is always associated with peaceful, quiet days spent amidst fields and gardens, and we instinctively conjure up in our mind's eye the lichen-coloured roofs and tall grey chimneys nestling amidst a wealth of green trees and foliage, and cool old-fashioned rooms, with white panelled walls and time-worn furniture. But to-night we do not want to talk so much about old houses as to deal with the problem of country houses to-day, and if the few notes and thoughts I have put together, from my own practical experience in various parts of the country, will in any way help you in building them, I shall be gratified, for in our work we are all students, and every day learn more and realise, I hope, that we have much more to learn.

At the present time in England more country houses are being built, and more money and thought are being expended upon them, than perhaps at any time since the days of the Stuarts. Knowledge and taste preside over the building of new houses to a greater degree than any time during the last fifty years, and a school of architects has arisen that is producing work that will rank with anything in either this or any other country. But this is not universal, and though the example of these men has been, and is, very potent, yet it will be long years before the mass is leavened and the country house is a joy to look upon, and able to hold its own with its forefathers!

In dealing with country houses one of the first things to be settled is the question of site, and though in many cases this is already decided and leaves but small choice, yet the actual position of the house and garden surrounding it needs the most careful consideration on the part of the architect. It is, of course, imperative that the site should be visited and thoroughly studied, for though this may sound a ridiculous reminder, yet the lack of this is responsible for so many failures in the disposition of the house and grounds that are continually seen, showing at a glance that they have been planned regardless of their surroundings and with no relation to either the garden or aspect. If the site is a small one, of some few acres in extent, we must consider the best approach from the road, trying to avoid cutting up the ground by unnecessary drives and paths, and whether any future buildings on the adjoining property will be detrimental.

Of course no hard and fast rules can be laid down, as everything will be governed by local circumstances and diversity of conditions, but a great deal can be done by thinking over, on the ground, all the possible objections, and trying to overcome them in imagination one by one.

The aspects having been studied, we must then plan out the garden, if possible, arranging this on the south or west, and, as a general rule, getting the house on the northern side of the ground. By so doing we can plant out our boundary to the south, and so get the garden and principal rooms full of sunlight, without the ultimate fear of losing it by being built out later on.

In dealing with a larger site one has a freer hand, though here the very abundance of choice is apt to lead one astray. The whole ground having been gone over, after a time the undesirable spots will be eliminated, and one or two suitable ones remain. Here we are faced with a more difficult task, for not only must we decide the best position for the house and surrounding buildings, but also the arrangement of the gardens, distance from the main road and cost of making our drive, and the numerous other buildings in connection with a fair-sized country house.

After the site is settled—in as dry a spot as possible, and on a southern slope for choice, as in this country we can do with all the sun we get—it is a good method to stand on the spot where the house will be, and, before anything else, decide the position of the approach road, and the pleasure and kitchen gardens. These will, more or less, resolve themselves into blocks, as aspects, levels of the ground, and so on will to a large extent decide their position and arrangement.

If the stables and coachmen's quarters are to be near the house, and form part of the scheme, they should be on the northern or back part of the ground, easily approached from the drive, without, if possible, passing the house, and contiguous to the gardens, for easy carrying of manure and other requisites.

The arrangement of the garden and the environment of the house very greatly control the plan, for it seems impossible to design the house with any success without, at the same time knowing more or less definitely the scheme of the garden lay-out. For years past English gardens have suffered, in that they have been, as it were, divorced from the house, which generally has been built and completed entirely apart; hence it is that in so many we see to-day, where much care and taste have been bestowed upon them, the result is disappointing, as neither the garden nor the house have been planned to fit the other. It may be almost accepted as an axiom that garden-making should never be considered as apart from the architecture of the house, for to a great extent it should be influenced by the plan of the house, which should be, as it were, continued in the garden, and conceived in the same spirit.

If the position of the house is settled, the levels of the site will roughly show where a terrace will be made up, and where the lawns and gardens will be, and these, to a great extent, govern the planning of the various rooms overlooking them. Do not, I beg, design your house by itself, and think you can fit a garden to it afterwards, for you cannot do so, with any success—just as a good and suitable frame enhances the beauty of a picture, so a carefully thought-out garden will form a setting to your house. So much is now being done, and so keen an interest is being taken in this most delightful craft, that the laying-out of gardens and their embellishment by garden architecture, is one of the practical interests of the pleasant side of life, and it behoves us as architects to keep abreast of this movement, and to study how best we can adapt our houses and gardens to each other. At the present time flower-gardening was never so successful or so eagerly enjoyed, but the growth of flowers is not permanent, and is, consequently, less expensive than other and structural adornments, so that it is possible in a few years, and at no great expense, to change the whole character of a flower-garden. But garden architecture and the planning and disposition of gardens is both permanent and costly, and if mistakes are made the experiment is a matter of lasting regret. Much of the external beauty of new country houses and homes, which in a hundred years will be old country houses, depends on whether they are successful or not in the arrangement of their gardens and surroundings.

The individual peculiarities belonging to every site and its special points should be kept in view and emphasised in the lay-out of the garden, and any local character, in the way of fences, hedgerows, stone and brick walls, should be retained, as nothing is so inharmonious in a garden as strange or obvious importations from other districts. The closeness of touch between nature and man's work shows up to an almost painful degree every

* A paper read before the Liverpool Architectural Society, on January 4, by Mr. E. Guy Dawber, F.R.I.B.A.

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failing in outline and detail, and serves but to enhance our admiration for the designers of the graceful examples still to be met with in old gardens. The old wrought iron and wooden gates are amongst some of the best features of garden accessories, and there are still many of these beautiful pieces of native craftsmanship left for us to admire. After all it is the homely, simple outlines and details that give us the most lasting pleasure, for anything lavish and extravagant, especially in a garden, however much it impresses by its costliness and the labour spent upon it, is apt to pall upon that very account.

In old gardens we invariably find a certain amount of architectural design bestowed upon them, in the shape of terraces, flights of steps, balustrades, and garden houses. The gardens were often inclosed with high walls—a thing people to-day seem to have a horror of—and quaint gateways, and pavilions to vary the monotony of their length.

I often think that nowadays far too much variety and charm is sacrificed for the sake of getting garden walls rigidly straight and consequently dull, merely to suit the gardeners' requirements. Where it is possible either in planning the buildings, or the arrangement of the gardens, it is good to get some portion private, shut off from the rest either by trailage and hedges, or walls, so as to avoid the effect of a garden seen all at once, and which conveys no sense of seclusion or mystery.

There is an unfortunate propensity amongst the public to select their greenhouses and conservatories out of catalogues, and all of us know the horticultural builder, who ruthlessly puts up some lean-to abomination, bad in proportion, thin and wiry in design, often spoiling the entire appearance of a well thought-out house. Most of us can call to mind the delightful old conservatories, with their small panes and spacious sashes, that all over the country have been, and are being, swept away to make room for the inartistic ones of the modern manufacturer. For purely commercial purposes such are admirable, but in a garden, or near a house if the conservatory is intended to form part of the general scheme, thought and good taste should be bestowed upon it. And when speaking of conservatories it should be remembered that the tesselated pavement of garish tiles is the worst possible background for flowers, as it detracts from their colour, and that a floor of some neutral tinted stone flags, or other material, is the most satisfactory.

I have dealt rather fully with garden work—the general lay-out and planning of the lawns, terraces, walls, steps, kitchen gardens, and so on—because this is essentially part of an architect's work, as it used to be in years gone by; and it is simply because we have, without protest, allowed the so-called landscape gardener to usurp our position in this matter that the public, as a rule, have ceased to associate the laying-out of a garden in any way with the duties of an architect.

In arranging the actual plan of a country house, a plain, straightforward, commonsense disposal of the various rooms is always in the end the most satisfactory and produces the best results, both internally and externally. If you examine the plans of any of the great masters in our profession, both in this and other countries, the obvious and studied simplicity of their planning will be patent to all. There is no attempt at eccentricity or puzzling odd features, no ill-shaped awkward rooms, full of strange angles and recesses, but rooms kept big and square with well-planned and proportioned doors and windows, all generally worked out on centre lines. Invariably, if you see a particularly pleasing and well-balanced elevation, you will find it accompanies a good and simply-arranged plan. Nowadays in some plans that we see the position of the furniture in the room, and the use it is going to be put to, seems to be the last consideration, and rooms are planned, bedrooms especially, in which it is impossible to arrange it. I know a country house where the principal bedroom has the bed standing in the middle, as there is literally no wall space not taken up by fireplace, doors, and windows. This in a modern house is quite inexcusable, and naturally brings contempt on architects!

The charm of a country house, as a rule, lies in the fact that we are not in any way governed by the cramped conditions of building in a town or city. There are no ancient lights to contend with, no narrow frontages or deep sites with blank walls, and but few restrictions and regulations to thwart our ideas. In towns house planning has to be considered from a different standpoint, and every inch of space utilised in the most economical manner; in the country a spaciousness of plan is one of the great fascinations of the house, and where we are not rigidly tied down to price, it gives an opportunity for a display of picturesqueness in the arrangement, quite as much as in the elevations. Every house must be planned to suit the requirements of its occupants, and to meet special circumstances. No two houses can ever be alike to-day any more than they were in the past, and I think it is this very diversity—of site, aspect, materials, and occupants—that gives architects such a chance and scope for their powers as seldom falls to the lot of other workers.

In designing a country house we should think it out in the "round," and recollect that it will be seen from all sides. There should be no back to it, no unsightly straggling outbuildings and offices; but all self-contained and arranged, so that from all points of view it is interesting and picturesque. A little thought will soon enable us to do this, for nothing is so unpleasant as the idea of there being a "back" to a house in the country after the manner of a town or city. Some of the most picturesque parts of old houses are the kitchens and outbuildings, and that is the reason why I am so insistent upon having the house and garden arranged at the same time, because often the most pleasing views of a house are obtained from the kitchen gardens and the domestic portions of the building. The plan again governs the roofing, and wherever a house is difficult to roof you may be sure the plan is wrong and needs reconsideration.

As a very broad rule it is well to keep the various rooms and lines of walls alike in width, so that the spans of the roof will be the same. If you get them unequal the ridges come at varying levels, and you get space in the roof too small for attics and wasteful and extravagant. So much of the beauty of a house depends on the grouping and arrangement of the roof.

As I mentioned before, the plan of a house is governed by the daily life and pursuits of the occupants. In a district, for example, where large house-parties assemble and much entertaining is done, a large hall or general sitting-room will be found more useful than the ordinary drawing-room—indeed it is almost indispensable. It is the one room where everybody gathers, where books and papers are read, tea is taken, and where all the inmates assemble both before and after meals. The old-fashioned drawing-room is to my mind almost unnecessary, as nowadays people—the younger ones especially—generally migrate to the billiard-room after dinner, and if this is made large enough to take the table at one end, and with ample space for easy-chairs around the fire at the other, it makes one of the most popular rooms of the house. This hall should be treated as a living room, with no external doors, and arranged with a fireplace, and, to be thoroughly comfortable, its importance should not be overlooked, as it gives a good impression on entering the house, and first impressions of buildings, as of people, go a long way. For a moderately large country house a hall, dining-room, billiard-room, and business-room, with a boudoir or sitting-room for the lady of the house, which can be used as a drawing-room, opening for choice out of the hall, gives really all the accommodation needed, and with well-arranged domestic quarters makes a thoroughly workable house.

Of course, circumstances govern the plan to a great extent, but, as a general rule, it is better to get few and large rooms, as I have suggested, some communicating with each other, than a series of many smaller ones. It is both useful and effective to plan some of the rooms on a central axis, with large double doors, that on occasion can be arranged to open wide when entertaining. The doors can be planned to fold in four halves or two in the thickness of the wall, which can be brought forward on either side of the door, forming recesses for china or books.

When building on a sloping site, a pleasing variety of plan may be obtained by arranging some of the rooms on a lower level than the rest; this enables them to be made higher, yet still keeping the bedroom floor over on the same level. This, if the steps down are wide and shallow, gives an opportunity for delightfully picturesque effects, as we see in so many old houses.

In a country house, so long as the plan is well and conveniently arranged, I think it may with advantage be spread out. There seems no particular reason in planning it so economically that all landing space is omitted and the doors and rooms all concentrated together. It certainly gives far greater opportunities for picturesque grouping outside, and in the country, too, one takes life more leisurely than in town, and a few yards more to walk from room to room does not mean very much after all.

Wide and spacious corridors are, again, always attractive features, and add so much to the beauty of a house. If made wide enough, some 7 ft. or 8 ft., to admit of furniture being put in them, they are most useful, besides being of practical value in forming a channel for through ventilation. There is nothing that spoils the effect of a house so much as mean and cramped passages.

It is a question if too much importance is not given to the staircase in the ordinary country house. Where parlours and reception-rooms are upstairs, as in towns, then the stairs must necessarily be treated as one of the decorative adjuncts of the house; but where, as in the country, they merely give access to sleeping apartments, I am inclined to think too much is made of them. The old turret stairs lasted for centuries, until the Elizabethan days, and even much later in remote districts, and though we do not want to revert to these times, yet a circular staircase, if wide enough, is both economical and picturesque, and as all boxes and luggage would be taken up the servants' stairs, it is perhaps all that is necessary. A staircase carried up between walls is always pleasant, and gives a sense of seclusion and privacy that the usual open one seldom does, and in winter time curtains can be drawn across the opening if it gives directly into the hall.

In quite small country houses a departure might be made if two living-rooms only were arranged—one simply for meals, kept as compact as possible, some 14 ft. by 16 ft., and the other the general room, about 16 ft. by 30 ft., or more. This would be more useful and convenient than three or four smaller rooms, as they would be more economical in working, and certainly pleasanter both in summer and winter. Of course, it is absolutely essential that this hall, or general room, both in large and small houses, should be cheerful and bright, and, if possible, with windows overlooking the garden.

One frequently sees large halls in country houses lighted from the top, with no outside windows at all, and with a staircase leading immediately from it and carried round as a gallery above, with all the bedrooms opening off it. Here all feeling of comfort and seclusion is missing, and what should be the pleasantest apartment in the whole house becomes merely a cheerless and unventilated well.

It is unnecessary for me to deal in *detail* with the arrangement of the plan, as this is a matter that every architect must settle according to the requirements of his clients; but careful economy of construction and the working of the house should always be borne in mind. Next in importance to the arrangement of the living rooms are the servants' quarters. It is a great mistake to cramp these, for on the comfort of the domestics depends the smooth working of the house. In establishments that are not large enough to have a servants' hall it is a useful plan to omit altogether the old-fashioned scullery, and to make instead two kitchens—one, the front one, arranged with a fireplace, with dresser and cupboards around it, can be used as a sitting-room for the servants, where they can take their meals, and which can always be kept neat and tidy, and is cool in summer; the other, or working kitchen, would contain the range and the sink, so that all the cooking and preparation of the food, as well as washing of plates, could be done here.

If, in addition to the larders and other offices, there is a good pantry, where the glass, china, and silver can be washed and stored without passing into the kitchens, it makes a most compact arrangement, and, if the rooms are made fairly large, is suitable for quite a moderate-sized house.

Personally, in small establishments I am much against useless passages, as they are always draughty and take up room that would be better added to the kitchens.

Do not forget to give ample store cupboards

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and plenty of space for coals and wood and the lumber and boxes that always seem to accumulate in a country house.

In larger houses the whole arrangement of the servants' quarters is quite as important as any other part of the building, and they should be planned on broad and generous lines. In a house where many guests are entertained, in addition to a large servants' hall, there should be sitting-rooms for both butler and housekeeper, so that tradesmen or people who come on business connected with the house can have a meal here without going into the servants' hall. In the butler's pantry, besides the strong room, it is a convenient plan to fit up at the side of the fireplace a large cupboard with a close-fitting door, heated by hot water from the fire. The cupboard is used exclusively for warming the plates and dishes, which are brought here as soon as they are washed, and can then be kept thoroughly hot and taken out as needed, without in any way inconveniencing the cook when preparing the dinner. In addition, there should be a brushing and cleaning-room, with a large sink, and hot and cold water laid on, in which hunting and shooting things can be washed, and with a rack of hot pipes for drying and airing. Such details may appear trifling to you, but they conduce greatly to the easy working of the establishment.

In planning the bedrooms the position of the bed should always be settled, and then the other pieces of furniture arranged on the plan, as nothing is more annoying than to find it impossible to fit the pieces in afterwards. In new houses much more use should be made of fittings permanently built in recesses, etc., in the rooms, and if these are treated at the same time with the doors, etc., the decorative appearance of the room is greatly improved, and a saving of labour effected. Many architects to-day arrange these fittings throughout the entire house, so as to obviate, as much as possible, the importation of separate pieces of furniture, which only harbour dust and dirt, and are merely a survival of the Middle Ages, when one's possessions were carried from house to house in an oak or iron chest.

The additional expense when building the house is small compared with the cost of purchasing wardrobes and chests, generally selected without the least regard to the character of the rooms or the house they are intended for.

This also bears on another question. It is becoming more and more evident that the scarcity of servants is a problem, the solution of which will have to be seriously dealt with, and one that will greatly affect the future planning of houses.

In towns and cities this question is more to the fore than in the country, and has been the cause indirectly of so many people living in small flats and residential hotels, where the difficulty of obtaining servants is partially overcome. Girls that some few years ago would have gone into domestic service now flock to towns and become waitresses at cafés, or enter public offices, where their duties, though exacting and onerous for the time being, give them more leisure for recreation. It is therefore evident that the planning of houses for the future, whether for rich or poor, must be affected by this question, and, as architects, it is one that we should endeavour to solve by all possible and economical and labour-saving contrivances that can be worked out.

Of course, the whole standard of living to-day is entirely different from what it was even fifty years ago, when baths, closets, and hot and cold water circulations were quite unknown. Nowadays the smallest house is considered incomplete without a bath-room and hot and cold water laid on, and, as you know, in most of the workmen's dwellings to-day this is generally considered imperative. As the difficulty of obtaining servants becomes more severe, it is evident that baths and lavatories will be required in greater proportion, so as to be independent, as much as possible, of the assistance of servants, and in a short time a bath-room and lavatory will be considered a necessary adjunct to every bedroom, for though the initial cost may be great, yet the saving of labour is obvious, and where there is an abundant water supply and a system of hot water throughout the house there can be no objection. Many people urge that we should be better and healthier without this complexity of sanitary appliances, but that is not the view of the general public, who demand these things not as a luxury but as a necessity.

In a country house of any size it is advisable to have the hot water circulation—that is, the water that supplies the baths and sinks, etc.—heated by an independent boiler, so as to leave the kitchen range entirely free for the cooking purposes. Too much stress cannot be laid on this point, as before breakfast, when hot water is required, the range is then in use, and similarly before dinner at night, so that it is impossible to work both range and hot water satisfactorily from one fire, unless in quite a small establishment. With an independent boiler all this is obviated, and much friction avoided, and by a little management plenty of hot water can be obtained by day and also by night, which, in case of illness, is a great boon. In a small house, when an independent boiler is not possible, a Radiator fixed to the hot water circulation, on a landing or passage, regulated by a valve, adds materially to the comfort of the house, without in any way increasing the cost.

If the linen cupboard is arranged in some place near the kitchen the hot water cylinder can be placed in it, so as to insure a supply of well-aired linen, and the expansion pipe taken up into the cistern-room over. All rooms where hot water will be laid on should be arranged as near the kitchen or boiler as possible, so that the water has not too far to travel laterally from its source, which not only makes the general installation more expensive, but gives the water a greater chance of getting cool.

The position of the bath-rooms, water-closets, and housemaid's closets upstairs should be planned to come over rooms on the ground floor, where sanitary fittings will be required, so as to simplify the drainage plan, and reduce the number of unsightly ventilation pipes on the external elevations.

When speaking of sanitary matters, sufficient stress cannot be laid upon the fact that all drains, traps, pipes, and so on, need quite as much attention and periodical examination as do fireplaces and flues. It is an extraordinary thing that in the house where a grate full of ashes or the debris of many days' fire would not be tolerated for a moment the drains, gullies, and sanitary fittings are left to take care of themselves, and hardly any attention is given to them; then when a case of nuisance or stoppage arises, the whole system of modern sanitation is at once condemned as bad and dangerous to health. All rain-water gullies should be regularly cleared out and examined every month, and grease traps to sinks, etc., every week. Cisterns should be thoroughly emptied and cleaned out at least twice a year, and the hot water boilers every three months, if the water is at all inclined to fur the pipes. If such matters are attended to as a matter of course "drains" and such things would not bear the bad reputation they do now.

(To be concluded in our next issue.)

ADDITIONS RECENTLY MADE TO THE VICTORIA AND ALBERT MUSEUM COLLECTIONS.

AMONG many valuable and interesting additions to the Museum are two plaster casts from the antique. One is a cast of a kneeling youth from the original in Parian marble, found during the excavations in 1883 in a room of the villa of Nero of Subiaco. This figure was placed first in the Monastry of S. Scolastica in that town, and afterwards removed to the Museo Della Terme, Rome. Unfortunately the head, one whole arm, and one forearm of this exquisitely modelled statue are wanting. It is dated the second half of the 4th century B.C. The second is a cast from a standing figure of Apollo Della Terme, taken from the Tiber in 1891 near the Palatine Bridge, which can now be seen in the Museo Della Terme. One hand and one whole arm are gone, and the statue is considered to be a Græco-Roman copy of a work of the 5th century B.C. It is more archaic in character, and has not the grace and delicacy of modelling shown in the former example.

An interesting terra cotta group of the Virgin and Child, presented by Mr. Fitzhenry, is shown in the Italian Court. Considerable damage has been done in removing the colour, evidences of which still exist. The work is assigned to the master of the Pellegrini Chapel from Bologna, and is dated first half of the 15th century.

The small collection of pewter work has been grouped together in cases in the South Court in a more comprehensive manner than formerly. A few additions have been made. In a case near these is shown an English silver chalice and paten dated 1527-8, bearing the London hall mark. This is a charming piece, beautifully designed, curiously out of harmony with the rudeness of the engraving.

In the furniture section are three interesting examples of oak work of the first half of the 16th century A.D. They consist of two doors and a towel rail, and are particularly valuable as additions to the few specimens of such work from the Rhine valley. The two doors are similar, and have their upper panels carved in relief with floral ornament surrounding medallions (one to each panel). These medallions contained busts in relief which have been unfortunately destroyed, some showing the method of building up for high relief. A white pigment covers them. There is no evidence of gilding. The lower panels are filled with "linen fold" carving. The towel rail hung above these is of very different character, although it is marked of similar date. The carving retains its Gothic feeling, but the design is Renaissance. The carved panel over the rail consists of a monogram surrounded by rays symbolic of St. Bernardino of Sienna, supported by angels. In the pediment is a figure of the Almighty with a dove over, symbolising The Holy Spirit. The carving is vigorous, but the architectural detail has not the delicacy of the work on the two doors, and indicates a transitional development very nearly approaching pure Renaissance.

A most striking contribution by Mr. J. H. Fitzhenry is a set of six French encaustic tiles, evidently pavement tiles, of quaint designs of animals, figures, and shields, in black, red, and white. Five are dated 14th century, and one is dated 16th century. Also a panel of five French faience tiles, dated 14th century, from St. Julien de Brioude (Haute Loire), enamelled surface, pale green ground and white ornament outlined in black. The designs are Gothic foliage in quatrefoil enclosing shields of arms.

In the Cross Gallery is a very beautiful glazed earthenware vase painted with blue ground and white and black outline. The design is Chinese in character, and consists of foliage encircling mythical lions and birds. It is believed to have been the work of the Chinese at Ispahan in the time of Shaw Abbas II., in the latter part of the 16th or the early part of the 17th centuries. Mr. Chas. Marling, the British Agent at Sofia, is the donor.

In the gallery over the south of the South Court is exhibited a collection of drawings acquired for the National Art Library, including Sir J. E. Millais's original drawing for wood engraving illustrating "A Dream of Fair Women," in Tennyson's poems (Moxon); James Mahoney's "Little Dorrit"; "Waits," by F. W. Lawson, in pencil and chalk; a strong wash study of "Alfred Jingle," by Frederick Barnard; and studies by John Leech and Charles Keene, of characteristic power. The pencil figure studies shown along with the ink reproductions of George Du Maurier are altogether satisfying.

THE "AULD BRIG OF AYR."—A report prepared by Mr. John Eaglesham, C.E., sets forth that, whilst the bridge is in an untoward condition generally, the most serious decay is apparent in the southernmost arch, of which the pier is also very insecure; the parapet above the crown of the arch betrays, by its subsidence, the continued injury sustained by reason of the increased scour of the river set up by the dredging of the harbour down stream. The bridge, which has undergone repairs at various times during the past forty years, consists of four arches, having a span of about 54 ft. each, but with varying lines of springing and other details, which extend for a length of about 260 ft. between the shore abutments; it is 12 ft. wide between the parapet walls, and now serves for foot passengers. It is believed that the bridge was first built during the reign (1214-49) of King Alexander II., and its erection is due, traditionally, to the care of two sisters, named Lowe. Recent events have, in a measure, verified its apostrophe in Burns' poem to the New Bridge:—

> Conceited gowk! puff'd up w' windy pride!
> This mony a year I've stood the flood an' tide;
> And tho' w' crazy eild I'm fair forfairn,
> I'll be a brig when ye're a shapeless cairn!

For in 1877 the New Bridge, built in 1787-8 by Robert Adam, suffered such damage from an increased flood of the river that it was in imminent ruin, and its reconstruction became necessary.

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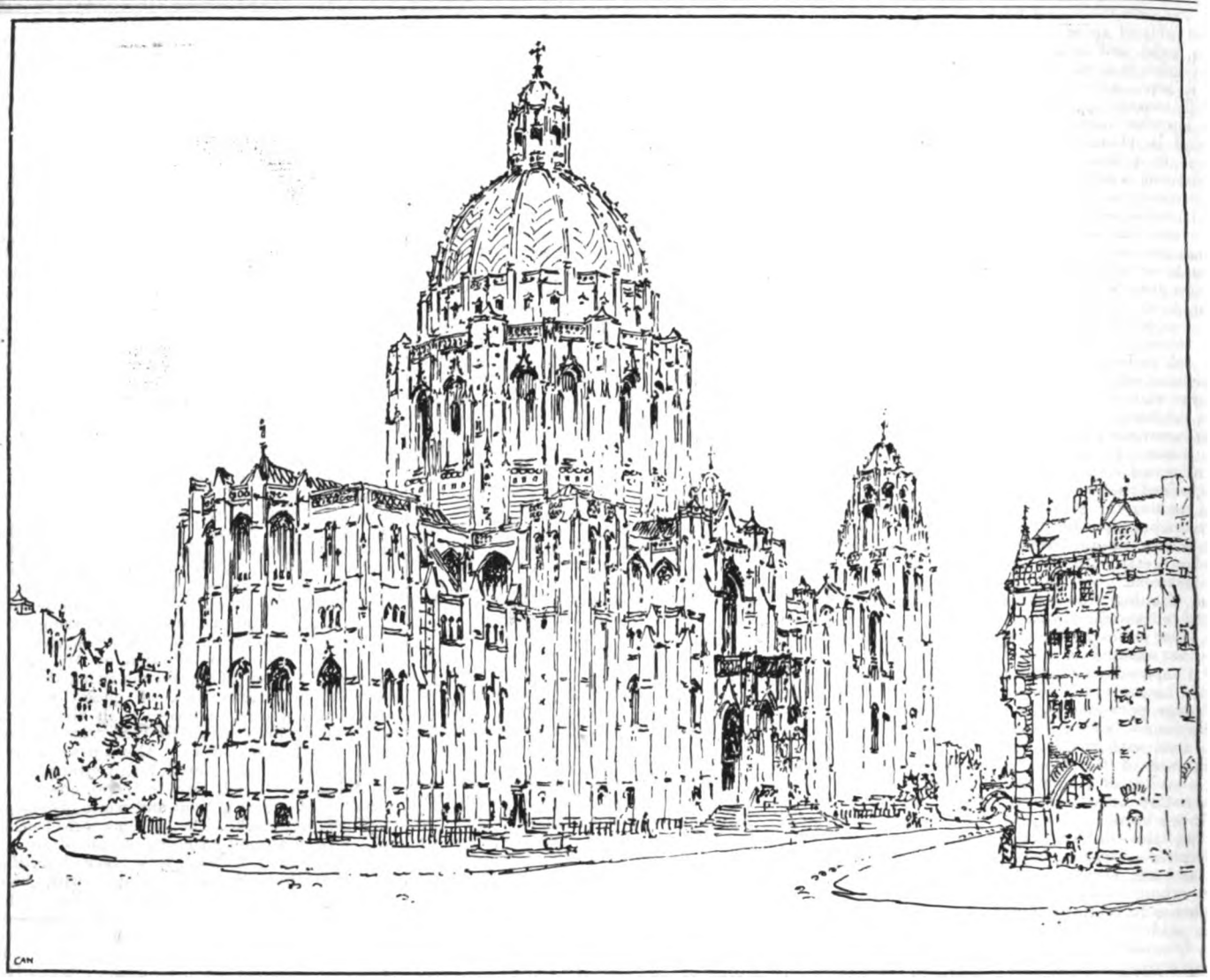

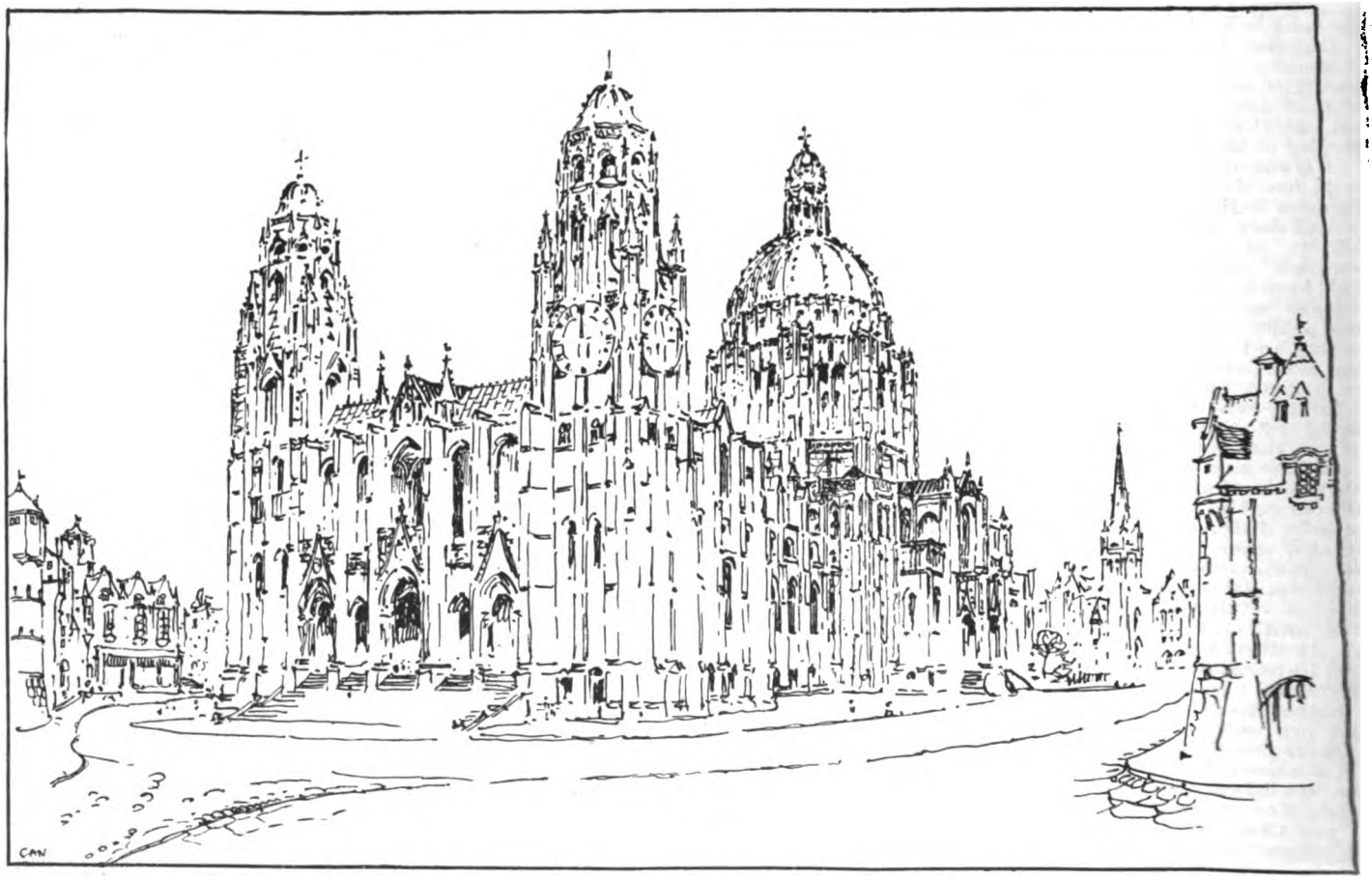

Church of "The Translation of St. Paul." Two Sketches by Mr. C. A. Nicholson.

CHURCH OF THE "TRANSLATION OF ST. PAUL."

THESE two slight but clever sketches of St. Paul's transformed into a Gothic building were sent to us by Mr. C. A. Nicholson, as a pendant to the translation of Peterborough Front into a classic design, which appeared our issue of January 2.

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THE ARCHITECTURAL ASSOCIATION.

AN ordinary fortnightly meeting of the Architectural Association was held on Friday evening last week, in the Meeting Room of the Royal Institute of British Architects, Mr. H. T. Hare, President, occupying the chair. The minutes and some nominations having been read, the following gentlemen were elected as members: Messrs. Francis Goldsbrough, W. A. Whiddington, and H. P. L. Cart.

New Premises Fund.

The President announced the following further donations to the New Premises Fund: Messrs. G. Alan Peache, 5*l.* 5s.; L. Sargant, 2*l.*; and W. M. Fawcett, 1*l.* 1s. A hearty vote of thanks was passed to the donors.

Deceased Members.

The President said he had to propose a vote of condolence to the relatives of the late Mr. Wm. Pain, who was liquidator of the Royal Architectural Museum, and was winding up the affairs of that body on the taking over of the Museum by the Association. Mr. Pain's decease at such a period was most unfortunate, and it would be necessary to appoint a successor to fill his place and complete the business. Mr. Pain was a very old member of the Association, and they would condole with the relatives in the loss they have sustained.

The President also proposed a vote of condolence with the relatives of Mr. Howard Dru-Drury, who was accidentally killed a few days ago, as announced in the last issue of the *Builder*.

Both motions having been agreed to,

Mr. Louis Ambler, hon. secretary, announced the donation of two prints from the *Builder*, dated 1857, illustrating the Royal Architectural Museum, and presented by Mr. W. A. Pite, to whom he proposed a hearty vote of thanks. This having been agreed to, a vote of thanks was accorded to Mr. W. G. B. Lewis for kindly presenting to the office the P.O. Directory for 1904.

Mr. Ambler announced that the following classes were about to commence: January 13, "Ornament and Colour Decoration," Mr. Cole A. Adams lecturer; January 14, "Greek and Roman Architecture," Mr. Hugh Stannus lecturer.

Egyptian Architecture.

Mr. Hugh Stannus then delivered a lecture on "Egyptian Architecture," illustrated by a large number of lantern-slides, made from photographs taken during a recent visit to Egypt. Mr. Stannus said he had had an opportunity of going to Egypt last winter, and he took some photographs while there, and he thought he might place before the members some of the results of his visit.

In studying Egypt, it was best to begin with a map, and to realise the surroundings. Egypt was two countries—Lower Egypt and Upper Egypt. It would help them to understand Egyptian architecture if they remembered that, and also that the physical nature of the two countries was different. In Lower Egypt, *i.e.*, the Delta, they had what was really a swampy morass, where reeds grew to a great extent, and especially the papyrus reed. So much was this the case that in olden times the papyrus came to be regarded as the national flower or plant, just as we speak of the rose of England, the shamrock of Ireland, the thistle of Scotland, and the leek of Wales. There was also plenty of mud; and hence they used the bundle of reeds plastered with mud for constructional building purposes, though later, when translated into stone, the reeds became more or less of a decorative feature. Lower Egypt, too, was nearest to a timber country, *i.e.*, the hills of Lebanon.

In Upper Egypt, on the contrary, they found the lotus and the rocky cliffs, which gave rise to rock-cut caves, stone piers, etc. The valley of the Nile was Egypt; there was no other Egypt but the valley of the Nile and the Delta—and the plant that grew in the Nile valley was the lotus. After every inundation of the river, the lotus sprang up, and it had become associated in the minds of the people with the goodness of the gods—for if there was a good inundation the lotus was plentiful. On festal occasions the lotus-flower was made use of in decorations, and in some paintings we saw ladies wearing garlands of the lotus-flower on their heads. The lotus leaves were used to decorate mummy-cases, coffins, or tombs, and in some cases the Egyptians used to tie little bouquets of lotus-flowers round the tops of their columns in their funeral shrines and their ordinary houses, so that the lotus became associated with the top of the support, and it was only one step more to become the motive for the capital.

It is always useful to distinguish between the different countries, with their products. The materials available in each country dominated the design, both in construction and decorative details, in early times; and the differences were more pronounced. Up to the Eleventh Dynasty there was a paralleled development of the compound shaft in Lower Egypt, and the pier in Upper Egypt. When people could get stone in large masses they used a trabeated construction; whereas if they had only reeds they had to tie them in bundles in order to get strength. In the Eleventh and Twelfth Dynasties the workmen had mastered their materials with better technical equipment; and there were better carrying facilities, hence it was possible to bring down the stones of Upper Egypt into Lower Egypt, and so obliterate to some extent the difference between the two countries.

It has always happened, when two countries had different products, that their arts were different, but with an interchange of products there was an interchange of arts, and that difference likewise was obliterated to a great extent in the case of Upper and Lower Egypt. Some people regretted the introduction of railways, and there was no doubt the railway had tended to obliterate the local differences in England and other countries. So with the improved carrying facilities in Egypt, the same thing had happened.

The next stage of the development came when the Hyksos had been driven out, Egypt was one country, and the King styled himself "Neb Taui"; and the symbolic plants of the two countries, the papyrus and lotus, were combined in decorative representations.

Still later, when the Kings of the Eighteenth Dynasty travelled, hunted, and conquered, and married the ladies of Asia Minor, exotic designs were introduced into Egypt from the countries of Asia.

There was also a period when the Egyptians introduced symbolism more often into their capitals, which show heads or faces of Hat-hor, who was a later form of their earlier goddess Isis. Afterwards there was a period of richness in detail, when Egypt came in contact with Greek art, which caused a renaissance of Egyptian detail and style in the time of the Ptolemies, by the Greek principles and mind working with Egyptian details.

Mr. Stannus then showed a large number of lantern-slides, grouped as follows:—The Country, the Materials, the Stone-orders, the Capitals, the Pylons, and the Clearstories. The illustrations included a native Shelter, supported by bundles of maize-reeds, which was very strong; part of the wall of the old Temple of Osiris; brick Vaults used as granaries and wine stores at Thebes, built 3,000 years ago, in sloping courses of unburnt brick, with a pebble between; which were as strong to-day as ever they were.

In demonstrating the treatment of columns, Mr. Stannus made some interesting remarks on the development of the column from the square pier up to the sixteen-sided figure, and he gave several lantern illustrations, showing square, polygonal, and other columns. The square treatment included the Temple of Kha-f-Ra; the Temple of Tehut-mes III. at Medinet-Habu; and the Temple of Sety I. at Abydos. The Polygonal:—At Beni-hasan the tomb at Khnum-hetep, the tomb of Ameni, and a portion of the beautiful Festal Hall of Tehut-mes III. near Karnak. One illustration was of part of the Temple of Sety I. (Nineteenth Dynasty) at Abydos, showing pilasters.

As to capitals, there were the Bud capital, the Flower capital, the Palm capitals, the Ptolemaic capitals, and the Hat-hor capitals. Mr. Stannus pointed out the differences between the various kinds: the lotus was rather more convex than the papyrus, and so with the buds. The sepal was as long as the petal in the lotus, whereas in the papyrus the sepals were short, and the beautiful fluffy stuff which grew out was much longer. The following were among the slides showing the lotus-bud capital: Tomb of Ptah-shepses (Fifth Dynasty); tomb of Khety (Eleventh Dynasty); the sanctuary of Tehut-mes III. near Luxor; the plan of the court which Rameses skewed in order to avoid pulling it down; the beautiful court of Amen-hetep III. near Luxor, etc. The lotus-flower capital was shown in two little toilet-vases of green pottery, found last year at Abydos; the beautiful pectoral of Usr-t-sen III. (B.C. 2681-2660), and capitals from Philæ Birth-house of Energetes II. (B.C. 120). The papyrus-flower capital was seen in the colonnade of Amen-hetep III. near Luxor, and in the Stelai of Tehut-mes III. near Karnak.

In some interesting remarks on the Palm-leaf capitals, Mr. Stannus, with the aid of diagrams and lantern-slides, showed the resemblance between the Mesopotanian capitals and growing palm leaves, and he suggested that the capitals had their origin in the palms, and he especially pointed out the representation in the capitals of the dates between the drooping and the erect leaves of the palm.

Having shown some Ptolemaic capitals, the lecturer gave a number of slides showing the origin and the development of the Hat-hor capitals. The first was a statue of Isis (typifying divine motherhood, in which cow-horns were represented), Temple near El Kab (one face only), Temple at Dêr-el-Bahri (two faces), Temple of Isis at Philæ (four faces), the Birth-house at Philæ, etc.

In dealing with the Pylon, Mr. Stannus showed slides of the Temple of Amen near Luxor, the two figures in the Theban plain, etc.

Several Osirid figures having been shown, the lecturer made some remarks on Clearstories, and showed, in conclusion, several illustrations of Karnak.

Mr. R. Phené Spiers, in proposing a hearty vote of thanks to the lecturer, said that in reference to the wavy course of brickwork at Abydos, did Mr. Stannus agree with the conclusions of M. Choisy on the subject in his new book? [Mr. Stannus: No.] Well, the subject was rather a long one to go into that night, but there was something to be said for the theory. M. Choisy found that these walls, with undulating, wavy courses, were built in the vicinity of streams of water or springs, and that all other walls were in high positions away from water. The author suggested that, in consequence of the changes of temperature between the night and the day, the mud-brick walls were built to allow of expansion without dislocating the structure. It was an interesting theory, arising out of the subject of construction in Egypt. Mr. Stannus had indicated the difference between the lotus and papyrus, but it might be as well to say that the papyrus plant was not to be found in Egypt now. He was not sure as to the date of the first lotus-flower capital. Mr. Stannus seemed to think it was not used until the Twelfth Dynasty, but he (the speaker) was inclined to think that even in the pectoral illustration which Mr. Stannus had shown the enclosures on each side were really intended for columns. As to why the Luxor entrance court was skewed, Mr. Stannus had come to the conclusion that there was an ancient temple in the foreground which had to be included within the new additions. It was such a long time since he (the speaker) was there that he was not able to say, but M. Choisy said that the temple was so near the river that the builders were obliged to do as they did. Mr. Stannus had taken the subject of the lotus-bud column a little further than was usual. It was a very ingenious piece of reasoning-out.

Professor Elsey Smith said he had much pleasure in seconding the vote of thanks to Mr. Stannus for his interesting and suggestive remarks, and for his beautiful photographs, and the manner in which he had used them and his diagrams.

Mr. J. D. Crace said that when he visited Egypt his attention was largely devoted to the Mahommedan architecture, and, although he visited the temples they had seen views of that evening, he did not study them as an Egyptologist. They could not but admire the method with which Mr. Stannus brought before them the different points he wished to make. The remarks by Mr. Stannus gave food for thought, though whether the deductions were in every case those which they could agree with, was a matter for each one to be guided according to the extent of his studies.

Mr. Ronald P. Jones supported the vote of thanks, and recalled Fergusson's remark as to the advantage of a visit to India, since it familiarised the architect with a complete pointed arch system which had nothing whatever in common with European Gothic. This remark, he thought, was doubly applicable to Egypt, as, in addition to the Saracenic work there, which was purer and more refined than any to be found in India, the ancient temples provided a striking contrast to the Greek and Roman

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columnar architecture. In many points, such as the size of the architrave and abacus and their relation to the diameter of the column, the Egyptian order was very different from the European. Then there was also the contrast in the principles of temple planning, owing to the fact that the Egyptian temple was forbidden ground to the general mass of the people, and was only open to a select priesthood. This led to the development of a plan designed solely for internal effect, while the exterior presented a series of solid blank walls of great height, with the pylon towers forming a façade. Another striking contrast which gave interest to Egyptian work was that between the two styles themselves. For he did not think it possible to find in any other country two systems of architecture, developed at different periods, but under the same climatic conditions, which were so absolutely opposed to one another in principle, method, and effect as the ancient and mediæval Egyptian styles.

Mr. Arnold Mitchell said he must add his thanks as one who had not been to Egypt. They were fortunate in having a man like Mr. Stannus to come and give them the benefit of his knowledge and experience. It was only comparatively recently that the study of Egyptian history had been possible to students. Until the Rosetta stone was read, the history of Egypt was a closed book. A headmaster of a public school told him recently that one of his boys was actually taking down the notes of his class in hieroglyphics.

The President said that the subject was a closed book to most of them, but they could understand, in listening to the lecturer, what a fascinating study it must be if pursued on the spot. The reading and study from a book of Egyptian architecture was rather dry and uninteresting, but it was a very different matter when it was talked about in the pleasing way in which Mr. Stannus had dealt with it. It would be very interesting to hear some of Mr. Spiers's criticisms thrashed out more than they had been. Mr. Stannus's theory as to the development of the column was most interesting, and when Mr. Stannus was referring to the papyrus cap he (the speaker) could not help thinking of a little fable about the origin of the Corinthian cap, which is in "Gwilt's Encyclopædia." There was a little block of a basket of acanthus leaves which was given as the possible origin of the Corinthian cap; but one or two of the illustrations they had seen seemed to form quite sufficient basis for the idea that the Corinthian cap had its origin in Egypt.

The vote of thanks having been heartily agreed to,

Mr. Stannus, in reply, said there were at least a dozen other branches of the subject; but he had thought it best to limit his remarks to an attempt to classify the Egyptian orders. There had been several similar attempts, one by Sir Gardiner Wilkinson, which was a little unscientific, and he thought it would be best to show as he had done the gradual evolution of the subject. As to Mahommedan work, he had taken thirty or forty photographs at Cairo, but it had not been possible to show them that evening. As to Mr. Spiers's remarks as to the curved coursing of the brick wall at Abydos, there was no river nearer than the Nile, and that was nine and a half miles away, and he did not think the influence of the Nile would produce the effect. Professor Petrie gave the reason for the curving of the wall: it was in order to make a stronger piece of walling, and he would rather take that opinion than M. Choisy's. As to lotus-flower capitals, he admitted that there were representations or fancy pictures of them as early as the Fifth Dynasty, but he suggested that this would not decide much, because there were paintings from Pompeii showing architecture, but no one could found anything on them, and the same remark applied to the pectoral he had shown, and to the early representations of the lotus-flower capitals.

The Chairman announced that the next meeting will be held on the 27th inst., when Mr. Maurice B. Adams will read a paper entitled, "As to the Making of Architects," with examples of draughtsmanship. There will be an exhibition of drawings by well-known architects during the evening.

The meeting then terminated.

STAINED GLASS WINDOW, WESTBURY PARISH CHURCH.—A stained glass window has been erected on the south side of Westbury Parish Church, Bristol. The work was carried out by Messrs J. Bell and Son, of Bristol,

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION:

SKETCHING AND PHOTOGRAPHY.

AT the sixth meeting of the current session, held on January 6, two short papers were read upon the relative merits of sketching and photography in the study of architecture. The subject was productive of a long and varied debate, in which members of the Association Camera Club took a prominent part, at the invitation of the Discussion Section.

Mr. Frank Lishman, in stating the claims of sketching, said that all present would agree that the aim of either method was the getting hold of the principles of design in the buildings under consideration, and not the mere collecting of illustrations. In sketching it was the *doing* of the sketch, the taking note, which counts, and the result was of secondary importance. But in photography the order was reversed, for there was practically no *doing* and no taking note in the same useful sense. In certain cases—sculpture, for instance—photography was essential to retentive study, but, generally speaking, it was imperative that the habit of using a sketch-book be firmly established before following the alluring pursuit of the camera. Whether on simple or ambitious lines, sketching should be intelligent, reflecting the mind's impression. It would not fail to bring the student into sympathy with the subject, in revealing its beauty or failure as each part was laid down, and as the whole was contemplated hour by hour. The camera alienated sympathy and annihilated time. The evolution of a sketch arose out of a process of analysis, in which relations of part to whole, of solid to void, proportions, grouping, and scale, were all considered. The critical faculties, which would otherwise lie dormant, were brought into play, inducing discrimination in essentials from non-essentials, accident from purpose. Photography did not awaken them. Mr. Lishman then drew attention to the many advantages offered by sketching—in taking notes, in expressing colour, and in fitting the result of the effort to a useful application of the study. Photography had narrow limits—it did not give planes, and its work was superficial at all times. A sketch might be made of any size or shape, and have all kinds of possibilities for future addition; this elasticity was of great importance.

Mr. G. H. Lovegrove then read a paper upon the photographic side of the investigation of architecture, first pointing out that the work of the camera extended the study to many more enquirers than the limit of sketching allowed. While admitting that the practice of photography did not train the hand and eye, the author thought that this was not the aim and end of all study. The great disadvantage of sketching was the length of time necessary adequately to treat a subject. In all ordinary works the camera would produce at least a dozen accurate representations in the same period, and then the building would be more fully examined and noted. Photographers were not necessarily in a hurry, as most sketchers assumed, and the faults of perspective or distortion made by the former were as capable of correction as mistakes made by the latter. Accuracy was more surely to be obtained by the photographic process; but it was at times too truthful in not admitting of the easy elimination of discordant features, a privilege which the sketcher enjoys. Mr. Lovegrove condemned the habit of working up or producing sketches from photographs; that was a misuse of the science. The camera could not now give us colour, and, indeed, was very liable to render false tones or colour values, though the recent advances in colour photography had undoubtedly raised hopes in this respect. One of the greatest benefits from the use of photography was to place the student on a level with his fellows at all times. To a very large extent the early, and often later, work of the sketcher was of no use to himself or anyone else in after study. In summarising the advantage of this side of the question Mr. Lovegrove claimed that a vast amount of time was saved, and the results contained accuracy, thereby proving of greater subsequent use. In this latter aspect it was significant that photography should take such a large place in the illustrations of all present-day architectural publications.*

* As far as our own publication is concerned, this is certainly not the case. The majority of our illustrations are from drawings, and we prefer that it should be so.—ED.

Mr. Ambler, in opening the discussion, proposed a vote of thanks to the authors of the papers. The speaker, after a careful review of the respective claims, and basing his conclusions upon a long experience as a sketcher, threw in his lot on the side of sketching, but it should of course be undertaken with certain definite and intelligent motives. An architect of eminence, in criticising his early sketches, characterised them as mere evidences of visits to certain buildings. Sketching was unquestionably the surest means of committing features to memory. It was noteworthy that the majority of the best architects of the day were able sketchers; there were, however, a few brilliant exceptions.

In seconding the vote, Mr. Wonnacott prefaced his remarks with the statement that he was a beginner, and, as such, considered photography as the best means of studying buildings, as it embraced all that had been claimed for sketching. He drew attention to the facilities for enlarging any desired part or detail, and in all cases advised the use of only the best possible apparatus.

Mr. A. H. Belcher considered that no man could become an architect who had not acquired proficiency in sketching, because, in the study of old work, it enabled the spectator to penetrate deeper into the principles underlying the design. Photographs were of less value in after years. He would summarise by suggesting the use of photography for general effects, sketching for details of design or construction and measuring, for a complete study.

Mr. F. R. Taylor supported Mr. Lovegrove's contentions, and did not admit that sketching accomplished what photography could not fulfil.

Mr. W. A. Pite said he came to learn. After what had been said he contended that the only way to absorb the characteristics of a building was by sketching. The result of one's labour would manifest the individual impression of the student, which was an important consideration. Photography reproduced mechanically a representation that was not useful for subsequent application. He regarded the photographers as a kind of sportsmen who went about shooting everything without reference to the object of their sport.

Mr. W. A. Forsyth thought the papers and discussion had taken hard and fast opposite lines; both photography and sketching were aids to the end in view, and, therefore, it was difficult, in his opinion, to make such a definite separation. The habit of taking notes was the more important from all points of view, yet it was not complete without photographic assistance. The principal merit in sketching was the process of analysis, which became necessary in knowledgeable work. One of the risks in the use of a camera was that failures were often discovered at the developing stage, which is usually done when the subject is far out of reach. The saving of time was no recommendation.

Mr. G. Sherrin was pleased to renew his acquaintance with the Discussion Section. He considered sketching imperative in the matter of an architect's training, in which photography should be an aid. The great circulation of photographic illustrations in the publications of the day was undoubtedly exercising an influence on modern architecture. He urged all young men to sketch regularly and wisely, because he saw in the present-day work of young architects very little application of the results of their studies.

After Messrs. Gunn, Gammell, and Mears had spoken briefly in support of the sketching side of the question, the Chairman, Mr. J. H. Pearson, called upon the Special Visitor to sum up the discussion.

Mr. Raffles Davison, after unfurling a humorous cartoon by Mr. Crane, proceeded to lay his views of the debate before the meeting. His great esteem for the Architectural Association, with its long record of self-help, induced him at once to accept the Committee's invitation. He took exception to the title of the subject before the meeting—"Sketching *versus* Photography," there should be no *versus*. Did the *opportunity* to photograph do away with the *obligation* to sketch? In approaching this subject he ventured to remark that the deadly sin in architecture, as in everything else, was *affectation*. He would say, 'To thine own self be true . . . thou canst not then be false to any man." It was affectation pure and simple to discount the power of drawing in the education of an architect. But it was necessary to have

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an ideal; and an enthusiasm for a great ideal, which was the guiding spirit through seas of troubles in the art of architecture, would not be seriously checked even by a camera.

The use of a sketch or a photograph must largely depend on the mental attitude of the operator. To draw for the beauty of the sketch itself was one thing, but to obtain a useful record or valuable inspiration was quite another. Whereas the latter might be lacking in charm but yet fulfil its purpose, the former might possess that rigid accuracy to the exclusion of individual impression and inspiration; the broad-minded student would, however, endeavour to combine the ornamental with the useful. To become absorbingly conscious of proportions, rendering of detail, shapes and relations of parts, would produce a correct sketch from which it would almost be possible to build; but if, in a mood of keen appreciation, a rapid but decisive summing-up of the whole was hit off, you might obtain an inspiration of the highest value, such as no setting forth of hard facts would unfold. Mr. Raffles Davison then drew attention to what he considered a striking illustration of this aspect of the subject. A recent issue of the *Pall Mall Magazine* contained illustrations of the English Lake District in which photographs and sketches of the same view were placed side by side. Here the rigid accuracy of the photograph contrasted with the plastic truthfulness of the sketch—the mechanical record with the mental impression of the artist, Mr. Maurice Greiffenhagen. The spirit of the lakeland scenery was absent from the photograph, but the very essence of it was to be found in the sketches. The chief aim of students, therefore, should be to sketch for the spirit of the architecture, and their work should show that pleasure and enthusiasm were involved in its production.

The camera was more expensive, more cumbersome, and more uncertain than the sketch, elements which were comparatively unimportant; but, if the use of the camera deadened the spirits, obscured the artistic faculty, destroyed self-reliance, or weakened the drawing power, it should be used sparingly and not allowed to take the place of a better method.

If it were right to offer advice to those present, he would counsel the cultivation of broad views and wide sympathies—to raise and maintain the ideal, or little will result from the labour. The dissecting analysis of Gothic cathedrals and country houses, the photographic study of their details, the careful measurement of the bones of their construction, would never arouse the spirit that created them. The difference between the photograph and the sketch lay more in the process of its working than in the result. Turn the microscope or camera on to everything, if you will, but leave the sketch uppermost. In the sketch it was seen how the architecture appealed to the artist, and so, we might add, to our knowledge and estimate of it. In the photograph it would be observed that a fine lens was used together with beautiful solutions and printing-paper; indeed, the whole mechanical apparatus has been carefully manipulated. In concluding, the Special Visitor said that he felt the members of the Architectural Association were a body of men eager to pursue art for its own sake, who will neither be deluded by the sketch nor the photograph from the real aim of their ambitions.

THE SURVEYORS' INSTITUTION.

AN ordinary fortnightly meeting of the Surveyors' Institution was held on Monday, at No. 12, Great George-street, S.W., Mr. H. T. Steward, Vice-President, occupying the chair in the absence of Mr. Albert Buck, the President.

New Hon. Secretary.

The Secretary, Mr. Rogers, having read the minutes of the last meeting, Mr. Percivall Currey, the newly-elected Hon. Secretary, was introduced to the meeting by the Chairman, who said that he could not let the opportunity pass without saying a few words in grateful recognition of the valued services which their late Hon. Secretary, Mr. J. W. Penfold, had given to the Institution. He could say this with conviction because he happened to be one of the first members of the Institution, and he knew that in the early days, and for many years afterwards, Mr. Penfold worked hard for their society, and it must be very gratifying to him to see the Institution in such a flourishing condition as it is to-day. That must be great satisfaction to Mr. Penfold, and also to know that, after the hard work he had done for the Institution and the immense amount of pains he had taken for its benefit, his services were thoroughly recognised and appreciated by all of them.

Mr. Currey, before reading the donations to the library and library fund, thanked the members for having elected him, and said he hoped to fill worthily the office so long and so ably occupied by their old friend Mr. Penfold.

Industrial Decentralisation and Housing.

A vote of thanks having been accorded to the donors, the Chairman said that the business of the evening was to resume the discussion on Mr. H. T. Scoble's paper, read on November 23,* on "Industrial Decentralisation: an Important Factor in the Housing of the Working Classes."

Mr. T. W. Wheeler, K.C., said that in substance he agreed with everything that Mr. Scoble had said. He thought that Mr. Scoble's phrase, "dormitory towns," was an admirable one, and that the bringing of people into a big city in the morning in crowded conveyances, taking them back at night in the same way, and affording them a few hours' sleep in their own homes was not altogether satisfactory. He held that the workman, if possible, should not be taken to live far away from his work, but that the workman and his work should co-exist. In reference to the action of Messrs. Ransome and Co. and Messrs. Elliott Bros., in removing their works from London, he thought that that was a wise step on the part of those firms, but it was not stated that they had been able to take their workpeople with them. At Port Sunlight the problem was apparently solved—the workman and his work co-existed. It was well to ask: Who are the working classes? A considerable portion of the working class was able to provide decent houses and accommodation, and that should be remembered by all who were trying to provide the best homes possible—there was no occasion for philanthropic effort on behalf of these people; but, unfortunately, there was a large class who could not pay for decent accommodation. He objected to municipal trading, but he recognised that there was a class—a growing class, he was afraid—for whom it might be necessary a municipality should provide. For that class, who could not pay remunerative rents in London, he had come to the conclusion that the municipality might do something. The municipality were doing something for this class in Camberwell, for they had, not in their own name, but in the person of elected agents, gone into the market, bought up squalid property as cheaply as they could, repaired that property and made it healthy, and then had let it at rents which the class in question could afford. He thought that in that direction a great deal might be done. He was not in favour of compounding for rent, and he thought it would be an admirable thing if the British working-man were brought up face to face with the liability of paying his rates. London was not a densely occupied city; there was not overcrowding to the acre, but there was, for all that, overcrowding of a twofold character—*i.e.*, an overcrowding of an area, in some cases, and overcrowding per room, which was a most offensive and dangerous condition of affairs and which did obtain in London to a large extent. He could not see why London was so largely used for manufactories, and he thought that many factories which are now in London should have been told to go outside; at all events, they should not have been, and should not be, encouraged to come in as they were under the provisions of the Act of 1869.

Mr. Douglas MacKenzie said he had been engaged for a good many years in mechanical transport, and as the use of motor vehicles for mechanical transport of goods had come to the fore he had endeavoured to keep up with the subject. Every case, he found, had to be considered on its merits, and anyone wishing to use this form of traction would have to take what data he could obtain bearing on his own circumstances and then decide for himself. Many factories, in order to get good siding accommodation, had been erected close to railways, with the result that they were often placed in low-lying and unhealthy situations, while many excellent sites had been neglected. Was it possible to utilise those sites? He thought it was. Motor transport, for comparatively short distances, was able to compete with railways in the matter of rates, because the railways were eaten up by terminal charges. Five and a half tons was the critical paying load for motors, and if a manufacturer could not make up that load he would find it better and cheaper to send his goods by horse rather than motor transport. Unfortunately, the roads leading to many of these sites were not suitable for motor vehicles, for they were very soft. Even close to London many by-roads had not proper foundations or crusts, and it was impossible to work motor vehicles over them. He thought that a manufacturer who wished to erect his works on one of these sites should consider whether it would not be well, whether it would not pay, to have the road connecting with the main trunk road made up to a proper state. If that were done, the road would cost next to nothing in maintenance, and would enable the manufacturer to use motor vehicles to full advantage. Another point to be remembered was that in some districts there was considerable prejudice on the part of local authorities against mechanical transport, and he specially mentioned the Hornsey District Council. It must not be forgotten that mechanical transport was really an expert engineer's business. Many people who had tried to use motor vehicles had failed because it was not their business. There were, however, several motor transport firms in London who were prepared to quote a manufacturer who thought of moving his factory into the country In many cases goods were delivered in small quantities, and if a number of journeys had to be made for the purpose that would prove costly, but the difficulty could be got over by the provision of stores. Mr. Scoble had mentioned tramways as affording some means of transport for goods, but these tramways were almost entirely given up to the transport of passengers. It seemed to him that, certainly in the case of tramways built under the Light Railways Act, they should be used for goods transport as well as for passenger transport.

Mr. G. S. Hodgson said that, as an engineer who had been in the United States for twelve years, his experience was that if the Americans had the same machinery as we have—and they often would be only too glad to have it—they would not scrap it sooner than we do; he was glad to corroborate what Mr. Scoble had said on this matter.

Mr. A. E. Baylis said that a manufacturer having a non-commercial basis of profit—a profit in the way of some by-product—who was limited in the effects of competition by the few number of firms engaged in the industry, could afford to erect a model village, whereas a manufacturer working on an ordinary commercial basis, in competition, and with a margin, say, of ten to twenty-five per cent, on his main product, with no by-product, had not the margin with which to erect a model village. The by-products made it possible to erect a model village. Suppose the same factor were acting in the building industry. Assume, for instance, that the by-products on joiners' work—shavings and sawdust—could be converted into a patent medicine or food, or that the rubbish heap of the bricklayer or plasterer were a potent source of radium, in this event, he thought they would agree, there would be no such thing as a housing problem to solve.

Mr. A. King said that decentralisation was taking place, but it was neither necessary nor desirable to remove some works and trades from a centre like London into the country. It was a matter for the manufacturer, and the manufacturer should be left to decide. Industries had to be carried on in a good centre, and this was especially so in the case of some. To remove these trades from London, for instance, would be a mistake. Then take London from the health point of view; there was no city in the world to compare with it.

Mr. A. J. Martin said that the movement in favour of decentralisation afforded the landowner a good opportunity of improving the value of his estate by holding out to manufacturers inducements to settle on it.

Mr. H. Chatfeild Clarke said that Mr. Scoble's paper was an excellent one, and if they had many more as good the Council would have a difficulty in awarding the gold medal recently offered for the best paper read during the session. The question of the housing of the people was, like the poor, always with us. About forty years ago the matter was very pressing, and then it was that several of the artisans' dwellings companies started and commenced the good work they had done since, followed by the municipalities. As to the housing work of the municipalities, it must not be forgotten that they had had to pay for sites

* See our issue for November 28 last.

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in towns such a figure that it was perfectly impossible for them to build dwellings to pay any percentage at all, and the first thing they had to do was to write down the value of the site, as the London County Council had done, by a very large figure—in one case, he believed, as much as 200,000*l.*—before they handed it over to the Housing Committee to build upon. That did not seem to be business, and he did not think it was for the good of the community at large in the long run. The most they could pay for these sites was something under 6d. per foot super.—it ought not to be more than 3½d. or 4d. A company, even when paying this ground rent, was only able to pay from 4½ to 5 per cent. If a town could borrow at 2½ to 3 per cent., while that might be right and fair, it destroyed private enterprise, for no one could or would compete with the municipality. Another important matter was: How was it possible to stop the great influx of people into the towns? Only last week he heard—he hoped it was not true—that men near one of the midland towns preferred to sleep in the slums rather than the cottage in the country, in order to get the brightness of the gas light of the towns. He agreed that London *per se*, especially the east-end of London, was one of the healthiest towns in the kingdom. What streets could be better than the wide streets of the east-end? The whole question was one of £ s. d. The two model villages mentioned by the author could hardly be treated as practical politics, for, in the words of the promoter of one of them, they afforded an illustration of "what could be done with unlimited money." While it was possible for one or two manufacturers with practically unlimited money to make such provision for the comfort of their workpeople, how could other manufacturers do the same without the necessary money? Where was the capital to come from to erect cottages which did not pay 4 per cent.? They might let cottages in special cases at 5s. which were worth 7s. 6d. or 8s., but could they do that to any large extent? And could they take the factories into the country? Having got the factories in the towns, where distribution was to take place, he was inclined to think that the best solution of the problem was to leave them alone and house the people some distance away. The easier modes of access by electric trams, shallow trams, and motor 'bus or carriages, made it possible in the case of many towns to take the people three or four miles to some village where there was plenty of fresh air, and he did not think that a short journey to and from their homes was such a terrible disadvantage to the people. Around Sheffield, for instance, there were some beautiful and healthy places to which the people could be taken by cheap and rapid transit. He was much struck while at Leeds, in connexion with the visit of the Institution to that city, by the existence of a system there of which many of the inhabitants seemed proud, *i.e.*, the system of back to back houses. He believed that nothing could be worse than that system, for he felt it was absolutely wrong to have no through ventilation to staircases and sleeping-rooms, and to have conveniences practically at the front door. He admired the courage of the author in putting forward his views, but he felt that there were serious business and financial difficulties to be overcome before the problem could be solved on the lines advocated. He hoped that they would be overcome, and that many factories would be removed to the country, but for the present he felt that they had to see whether some mode of quick transit would not solve the difficulty.

Mr. Scoble, in the course of a brief reply, said that as to Mr. Wheeler's remarks about Messrs. Ransome's and Messrs. Elliott's factories, in the case of Messrs. Ransome the removal was too far away for it to be possible for the workpeople to follow, but in the case of Messrs. Elliott it was found that the workpeople gradually came to reside in the neighbourhood. As to passenger tramways being used for goods traffic, in some of the passenger tramways in the Midlands a great deal of goods was carried. At any rate, arrangements had been made for doing that. As to estate owners providing sites for manufacturers, that had been done at Trafford Park. Excellent sites had been provided, and of course the owners of the estate had benefited. At Port Sunlight money was not a consideration, but at Bournville the buildings now erected were constructed to pay 4 per cent. If a manufacturer got an increased return by more efficient labour, and at the same time received 4 per cent. on his capital, surely he was doing a good thing for himself as well as his workpeople. The meeting then terminated.

The next meeting will be held on the 25th inst., when Mr. Ralph Nevill, K.C., will read a paper entitled "The Garden City Scheme."

METROPOLITAN ASYLUMS BOARD.

THIS Board resumed its sittings after the Christmas vacation on Saturday last week, Sir R. Hensley being in the chair.

Correspondence was received from the Local Government Board sanctioning the proposal to enter into contracts with Messrs. Belliss and Morcom, Ltd., and Messrs. Drake and Gorham, Ltd., for work in connexion with the electric lighting of the Fountain Hospital at an estimated cost of 1,136*l.* and 2,792*l.* respectively, without first advertising for tenders; authorising the expenditure of an additional sum, not exceeding 450*l.*, on the erection of additional sanitary annexes at Caterham Asylum, the amount to be borrowed, and repaid in fifteen years; stating that they had approved of the plans relating to the proposed reconstruction of the South-Eastern Hospital, and promising to issue an order authorising the expenditure and borrowing of 135,200*l.* in respect of the proposed work, the loan to be repayable in twenty years; sanctioning the proposal to enter into a contract with Messrs. Meldrum Brothers, Ltd., for the installation of a refuse destructor at the Park Hospital at a cost of 320*l.* without first advertising for tenders; and authorising the provision of additional accommodation at the South-Eastern Ambulance Station, at an expenditure of 1,900*l.* Some discussion took place on a motion by Mr. Helby to rescind a resolution passed at a meeting of the Board in November by which they agreed, subject to the approval of the Local Government Board, to purchase a certain property at Hayes for the provision of a home for the feeble-minded. Mr. Helby contended that the Board had plenty of land on which buildings could be erected for the purpose. The motion was seconded by Colonel Graham, and carried by thirty-six votes to ten. On the recommendation of the Finance Committee it was agreed to make application to the Local Government Board for an order sanctioning the expenditure of a sum not exceeding 4,350*l.* on the extension of the generating plant at the Grove Hospital, and the wiring of the Fountain Hospital in connexion with the proposed lighting of that hospital by electricity. The action of the Works Committee in appointing Messrs. Northcroft, Son, and Nicholson to take out the quantities for the cleaning and painting works and repairs about to be carried out at the Eastern and North-Eastern Hospitals was approved. The following particulars of the Engineers' estimate of cost of cleaning and painting works at the various institutions during 1904 was submitted by the same committee:—

Hospital.	Engineer's estimate of cost.
Eastern	£850 0 0
North-Eastern	1,237 10 0
South-Western	744 0 0
Grove	245 0 0
Park	183 0 0
Northern	80 0 0

The Asylums Committee were authorised to carry out, at an expenditure of 509*l.*, the general cleaning and painting work required at Caterham Asylum during 1904; and 116*l.* 10s. on work required in the female centre building of the same asylum.

COMPETITIONS.

SCHOOLS, MANLEY PARK.—The assessor appointed by the Withington Education authority placed first the designs of Mr. Ernest Woodhouse, architect, 88, Mosley-street, Manchester, for new schools at Manley Park; and he has been instructed to proceed with the work.

MIDLAND FEDERATION OF BUILDING TRADE EMPLOYERS.—In the report of the Midland Centre of the National Federation of Building Trade Employers, presented at the annual meeting held at Birmingham, under the presidency of Mr. C. H. Barnsley, reference was made to the depressed condition of the industry throughout the Midland Counties, the information from some localities showing that the conditions had not been so discouraging for a long time. The following officers were elected for the ensuing year: President, Mr. J. Sharman Wood (Worcester); vice-presidents, Mr. H. Willcock (Wolverhampton) and Councillor F. G. Whittall (Birmingham); hon. treasurer, County Alderman, J. Bowen, J.P. (Birmingham).

Illustrations.

COMPETITION DESIGN FOR STOCKPORT TOWN HALL.

WE give this week the perspective view, plans, and detail elevation of the design by Mr. H. T. Hare, which obtained the third premium in the recent competition for Stockport Town Hall.

The following is the architect's description of his intentions in the design, embodied in the report sent in with it:—

"The schedule of accommodation has been closely followed, there being practically no deviation from the schedule of requirements. The plans have been so arranged as to work economically with the somewhat difficult levels of the site, and with a view to avoiding, on the one hand, an excessive amount of excavation, and, on the other, great waste in basements or spaces under floors. Provision has also been made for the possible addition of extra offices on the site of the adjoining chapel if it should be acquired (as doubtless it will) at some future time.

"Each department has been kept entirely distinct and self-contained, and the access to each is direct without passing through the corridors of any other department. The convenient relation of the several officials has also been carefully considered.

"The Town Hall has been placed on the Edward-street frontage, this being the highest portion of the site and the access most convenient. Ample exits, entrances, and cloak-rooms have been provided. A gallery has been placed at one end only, instead of at end and sides as suggested, but the full number of seats is allowed for. Side galleries are of little practical use except for the front row of seats, and further they render a successful architectural treatment of the interior of the hall extremely difficult, if not impossible. The Town Hall is, however, so designed that side galleries could be added if they are specially desired. A large platform or orchestra is provided at one end. The hall is accessible from the main staircase and entrance of the Municipal Buildings, so that it would be conveniently available for civic functions, etc.

"The buildings are proposed to be faced with Darley Dale or one of the excellent Yorkshire building stones, and the roof to be covered with Westmorland slates. The whole of the floors and staircases to be of fireproof construction, and the flat roof to be covered with mineral asphalte. The walls in the internal areas to be faced with white glazed bricks.

"The joinery in the Council Chamber, Town Hall, Committee Rooms, etc., to be of wainscot and other hard woods, and the ceilings to be in modelled fibrous plaster. Marble would be used in the finishing of the entrance hall and main staircase.

"The heating to be by low-pressure hot-water throughout. The ventilation of the Council Chamber and Town Hall would be effected by mechanical means, as indicated on the drawings, and the offices by flues carried up in the chimney stacks."

The architect's estimate of the cost of the building is 54,781*l.*, exclusive of the upper part of the tower, which would add 4,500*l.* more.

MISTRESSES' HOUSES: ST. FELIX SCHOOL, SOUTHWOLD.

THE drawing shows a pair of mistresses' houses which have just been added to St. Felix School, Southwold.

The school is worked upon the separate house system, and these are small houses for sixteen girls each, all teaching being carried on in a separate school block.

Red brick, with a little Portland stone, and tile roofing are the materials used. Messrs. John Youngs and Son, of Norwich, are the contractors, and the architect is Mr. Arnold Mitchell.

AN ARTIST'S COTTAGE.

THESE are sketches made by Mr. W. A. Pite for an artist's cottage proposed to be built at Great Malvern, but which, as it turned out, was not executed.

The studio is arranged as two rooms with different lights, which can be either separated or thrown into one.

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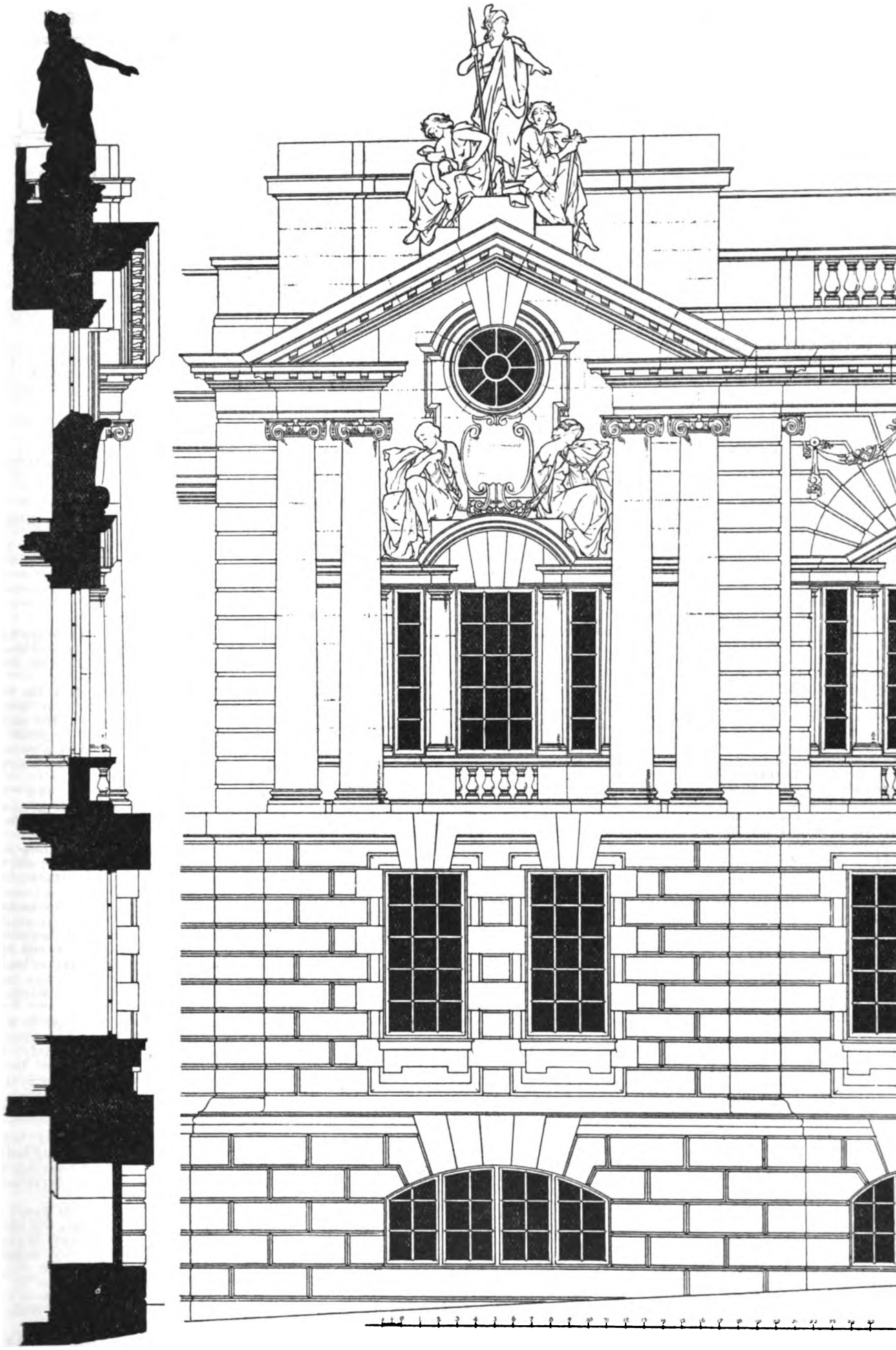

Stockport Town Hall: Third Premiated Design.

Detail Elevation.

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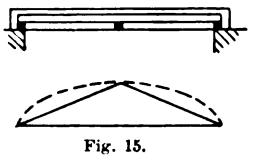
Fig. 15.

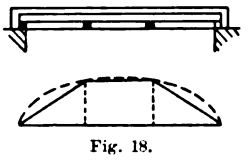
Fig. 18.

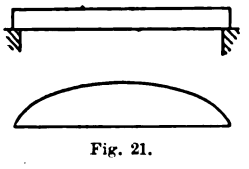
Fig. 21.

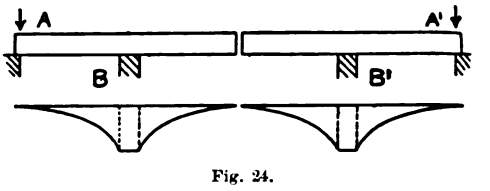

Fig. 24.

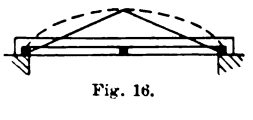
Fig. 16.

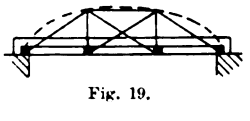
Fig. 19.

Fig. 22.

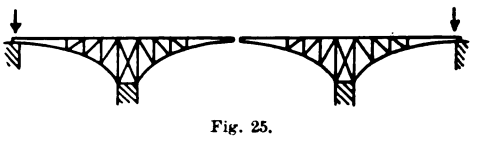
Fig. 25.

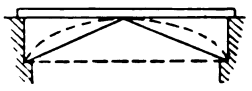
Fig. 17.

Fig. 20.

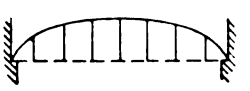
Fig. 23.

Fig. 26.

The Student's Column.

ARCHES.—III.

WHETHER arches be constructed of stone, brick, wood, or metal, the principles governing their stability are of the same nature, although the manner in which they are applied depends upon the material used and the type of construction adopted.

The masonry arch, built up of separate blocks having little or no cohesion, depends for its stability upon the presence of a permanent load so disposed that comparatively little importance attaches to changes in the direction and magnitude of stresses caused by a moving load, and the resultant of the stresses must never pass outside any joint. In practice, the line of pressures should always be within the middle third of any joint.

In a stiff arched rib of steel the conditions are very different, for it may be assumed without serious error that the rib is of uniform elasticity throughout, and the resultant of the stresses at any section of the arch may lie outside the section, because the rib is capable of sustaining bending moment.

In Art. I. we made a suggestion that the arch may have been developed from a very simple contrivance for resisting pressure from above, by arranging separate stones in such a manner as to make the dominant stress compression instead of tension. The *actual* derivation of the arch is involved in the obscurity of the past, and no one can do more than conjecture the era in which this form of structure was conceived or the manner in which it was developed.

The *theoretical* derivation of the arch can be traced very readily, and it may assist some of our readers to obtain a more correct appreciation of what an arch really is if we devote a little space to a demonstration of the manner in which it may be derived from various forms of the beam.

In the first place let us consider a parallel girder, supported at each end, and upon which a uniform load is imposed through a bearer at the centre, as in Fig. 15.

The maximum bending moment is the same value as in a girder under a uniformly distributed load directly supported by the main structure, but the diagram of bending moments is of polygonal form, and may be inscribed within the parabolic curve distinguishing the diagram of bending moments for a girder directly under a uniformly distinguished load.

The maximum bending moment at the centre of the span is

$$M = \frac{w l^2}{8}$$

where w = uniform load per foot, and l = the distance between the supports.

At any other distance x from one support of the girder the bending moment is

$$M_x = \frac{w x (l - x)}{2}$$

Hence, if d = the total depth of the girder, the maximum flange stress is

$$\pm S = \frac{w l^2}{8 d}$$

and at any point at the distance x from one support of the girder the stress will be

$$\pm S = \frac{w x (l - x)}{2 d}$$

the stress being compressive in the upper flange and tensile in the lower flange.

The polygonal diagram of flange stress is represented below the elevation of the girder in Fig. 15, and it will be understood, of course, that the actual dimensions of the diagram will vary in accordance with the conditions of any given case.

In the second place let us take a girder in which the depth is everywhere proportional to the stress diagram in Fig. 15. Such a girder is shown in Fig. 16, which illustrates a polygonal girder or truss. In this case the stress is uniform throughout the length of the girder, and the stress diagram is represented by a rectangle of the same size as that forming the elevation of the girder in Fig. 15. The principal members are an upper compression member of polygonal form and a horizontal tie.

Let D = the maximum depth of the girder, and, for the horizontal stress, we have

$$\pm S = \frac{w l^2}{8 D}$$

The compression of the upper member is due to the pull of the tie, and, conversely, the tension of the tie is due to the thrust of the upper member. A little consideration will show that the only function of the tie is to take the horizontal thrust of the upper member at each end, and if we substitute some other force, or forces, for the force excited by the tie the frame will still be in equilibrium.

Let us assume this substitution to be effected by placing the girder between two abutment walls, and at the same time the load to be transferred to the apex of the triangle. Then the thrust of the upper member is received by the abutments, and the tie, having no work to do, is absolutely superfluous. By disconnecting and removing the tie we have at once the simplest possible form of polygonal arch, as shown in Fig. 17. No change has taken place in the value of the horizontal stress, which is still represented by the equation

$$\pm S = \frac{w l^2}{8 D}$$

No consideration is needed to show that the equilibrium of the structure must be as perfect as that of the polygonal girder, the only difference between the two forms of construction being that in the girder one force of the resisting couple acts along a material bar, while in the arch the same force is exerted along an imaginary member indicated by a dotted line in the diagram.

This type of arch corresponds generally with the rudimentary form of construction shown in Fig. 2, p. 18, and the foregoing line of reasoning constitutes a scientific explanation of what we previously suggested may have been the "first dream of an arch."

The next stage in advance is to be traced in the derivation of a polygonal arch of three sides primarily from a girder, where the uniform load is carried by two bearers between the supports, and directly from a polygonal girder corresponding in figure with the stress diagram of the parallel girder. Figs. 18, 19, and 20 are sufficiently explanatory of the three forms of construction involved in this derivation of the arch, the final form here being seen to agree with that indicated in Fig. 3, p. 18.

It is unnecessary to refer in detail to further development of the polygonal arch by increase in the number of intermediate bearers. The larger the number of bearers the more nearly does the polygonal arch approach the parabolic form characterising the stress diagram of a girder in which the uniform load is directly applied to the upper flange.

Let us now glance briefly at the derivation of the parabolic arch from a parallel girder under a directly applied uniform load, as in Fig. 21.

The maximum bending moment, as before, is

$$M = \frac{w l^2}{8}$$

and the bending moment at any other point x is

$$M_x = \frac{w x (l - x)}{2}$$

Hence the maximum flange stress is

$$\pm S = \frac{w x (l - x)}{2 d}$$

the stress being compressive in the upper flange and tensile in the lower flange. These stresses are represented by the stress diagram drawn below the girder in Fig. 21.

Next let us take a girder in which the depth is everywhere proportional to the bending moment, as in Fig. 22. As before, the stress is uniform throughout the length of the girder, and the stress diagram is represented by a rectangle having the same dimensions as front elevation of the girder in Fig. 21.

The form shown in Fig. 22 is that of a "bow-string" girder, the name of which accurately suggests the character of the stresses in the upper and lower flanges.

The horizontal compression of the bow is due to the pull of the tie, and, conversely, the horizontal tension of the tie is due to the thrust of the bow. Further, as vertical shear is measured by the inclination of the curve of moments at each point in the span, and as the inclination of the bow is throughout proportional to the curve of moments, no shear remains to be borne by the diagonal bracing of the girder, so far as uniform load is concerned. Hence, the bracing is unnecessary when the load is not subject to variation.

In passing, it may be observed that in a bow-string girder of the construction represented, the load is not applied quite continuously, being concentrated at the joints of the bracing. Therefore the correct form for the bow is that of the inscribed polygon, but for our present purpose we assume that the parabolic curve corresponds with the manner of loading.

Assuming the girder to be placed between two abutment walls, as in Fig. 23, and both the horizontal tie and the diagonal bracing to be entirely removed, the structure is converted into an "equilibrated linear arch."

It is perfectly clear that the arch must be in equilibrium under the uniform load, for the bow of the girder from which it is derived is capable of supporting the load without any assistance from the horizontal tie, or from the diagonal bracing, and, consequently, must be in equilibrium under the forces communicated by the abutments and the vertical rods by which the uniform load is suspended.

It should be observed, further, that the arch is in equilibrium because its form corresponds with the curve of the bending moments for the uniform load, and that similar results may be obtained with any specified load by adapting the form of the arch so that it may correspond with the curve of bending moments for the load.

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In considering an arch as a development of the parabolic girder, we must remember that the vertical forces are in no way affected, and that the bending moment still has to be resisted. The resisting couple, however, does not consist of two opposite and equal stresses, but of the horizontal stress of the arch and the horizontal force acting along a purely geometrical line between the two ends of the arch.

The same results are obtained when the uniform load is imposed from above, as in the case of a masonry arch.

We will now proceed a stage further and trace the derivation of the arch from the cantilever. This inquiry will also serve the useful purpose of making clear the difference between cantilever and arched forms of construction.

In Fig. 24 we have two parallel girders held down at the abutments A A' and supported by the piers B B' respectively. The girders are assumed to be separated by a small space at the centre. Thus each projecting portion is a cantilever, counterbalanced partly by the weight of the supported portion, and partly by the downward force exerted at the anchorage.

Assuming the load to be uniformly distributed, as before, the stress diagram for the two cantilevers will be a parabolic curve as shown in the figure, the stress varying from zero at the extreme end of each cantilever to the maximum value at the piers:

$$\mp S = \frac{w l^2}{8 d}$$

the stress being tensile in the upper flange and compressive in the lower flange.

In Fig. 25 we have a pair of parabolic cantilevers nearly meeting at the centre of the span between two piers, the outline of each cantilever corresponding exactly with the stress diagram of each parallel cantilever shown in Fig. 24. Consequently, as the depth of each cantilever is proportional to the bending moment, the horizontal stress in each flange must be uniform, and the stress diagram will be a rectangle corresponding in size with that which represents the elevation of the parallel cantilever.

Each cantilever, being supported by the pier and anchored at the abutment, is in a perfectly stable condition and receives no support from the other cantilever. The profile of a bridge designed in this manner may give the appearance of an arched structure, and there may be nothing to show the casual and uninitiated observer that the centre span is not a parabolic arch, but, as we have already seen, it is nothing of the kind. The straight member along the top of the structure acts simply as a tie between the anchored end and the free end of each cantilever, and being disconnected at the centre there can be no arching action.

It is perfectly easy to convert the pair of cantilevers into one complete arch and two semi-arch spans without making any very noticeable alteration in the general appearance of the structure as a whole. All we have to do is to provide a solid abutment at each end, and to bring the projecting inner ends into contact, as shown in Fig. 26. Then the horizontal compressive force afforded by the abutments takes the place of the force exerted by the ties, and the latter, having no work to do, may be removed. Further, as the form of the arch corresponds with the curve of moments for the uniform load there is no necessity for the diagonal bracing unless the load is variable.

But the force exerted by the abutments does something more, for it acts continuously from one end of the structure to the other, and it is evident that the system of arches may be extended to any desired extent, providing the construction at the abutments and at the intermediate piers is suitable for resisting the thrust of the arches. The opposite thrusts at each pier will balance each other, so that the only load to be carried by the piers will be vertical, but the entire horizontal compressive force must be furnished by the reaction of the abutments at the ends of the system.

The explanation and the diagrams here given should make sufficiently clear the distinction between a series of cantilevers and a series of arches, but it is not quite so easy to detect the difference where actual structures are concerned. The roadway running along the top of the separated cantilevers always looks as if it were continuous when viewed from a short distance, although it does not connect the ties in such a manner as to convert any two adjacent members into an arch, and the roadway running along the top of a series of arches may in outward appearance very much resemble the ties used in cantilever construction. In fact, the auxiliary fittings of the two forms of structure frequently have the effect of masking the essential character of the construction, but this can be determined in any given case by examination of the drawings, or by close inspection of the structure itself.

BOOKS RECEIVED.

LOCKWOOD'S BUILDER'S AND CONTRACTOR'S PRICE BOOK, 1904. (Crosby Lockwood and Son. 4s.)

ST. PATRICK'S CATHEDRAL, DUBLIN. By T. H Bernard, D.D., Dean of St. Patrick's. (Geo. Bell and Sons.)

STRENGTH AND ELASTICITY OF STRUCTURAL MEMBERS. By R. J. Woods, M.Inst.C.E. (Edward Arnold. 10s. 6d.)

PROCEEDINGS OF THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS: 1902-1903. Edited by Thomas Cole, A.M.Inst.C.E. (E. and F. N. Spon. 21s.)

Correspondence.

ACTON TOWN HALL COMPETITION.

SIR,—With reference to your remarks upon the selected design for Acton Town Hall and Municipal Buildings, you say you regret "that no report accompanied the assessor's award which would have thrown light upon the merits of the premiated scheme." I do not know whether this is so or not, though my impression is that one was submitted, but, however that may be, my own report and description was available, and attached to the drawings whilst on exhibition, and I think it would only have been fair, considering your adverse criticism, had you published the same; it would, at least, have explained my ideas and given my reasons (however foolish they may have been) for doing some of the "strange" and "curious" things you complain of.

It is not my intention to enter into a detailed explanation, or to attempt to justify the arrangement of my scheme; it is sufficient for me to know that the assessor, a past President of the Royal Institute of British Architects, by whom he was nominated, and a gentleman of undisputed experience and position in the profession, and, moreover, a total stranger to me, has, after a very careful study of the drawings, arrived at the conclusion that my design is the most suitable of those submitted. Further than this, the Acton Council (to whom I am also a perfect stranger, and amongst whom, I understand, are two architects, both members of the Royal Institute, and also two quantity surveyors) have, after carefully examining all the designs themselves, unanimously arrived at the same conclusion. Under these circumstances, I am egotistical enough to think, in spite of your remarks, that my design cannot be quite so bad as you state, and must have some good points, even though you failed to find them. The unanimous adoption of a competitive design for a large and important block of buildings by a body of gentlemen who are all thoroughly well acquainted with the requirements of the district, is, I daresay you will agree, a very rare occurrence, and, I venture to think, is, to any open-minded person, a very convincing proof of the correctness of the assessor's award.

I take this opportunity of complaining generally of the light and careless manner in which architects' competitive designs have, particularly of late, been criticised in the Press, more especially the winning design, by those who have not made, or even had the opportunity of making, the close study and independent consideration of each design, and of all the many points involved in it, which is so absolutely necessary before an opinion of any value whatever can possibly be formed. It is unreasonable that a design which may have taken its author many weeks, or even months, to think out, should be literally pulled to pieces by one who has probably, at best, merely glanced at the "conditions" and plan of site before starting, and as likely as not does not think it worth his while, to even read the report.

WILLIAM G. HUNT.

*** We are, of course, happy to publish Mr. Hunt's letter, but he is quite mistaken if he thinks we are alone in our opinion. As to the accusation of "light and careless" criticism, we may leave that, as far as we are concerned, to the general judgment of our readers. We fear we are still in the mind that our opinion on the subject is worth more than that of the combined wisdom of the Acton Council, or than that of the assessor in this instance.—ED.

WHAT IS A BUILDING?

SIR,—The District Surveyor for South Fulham claims that a small open shed, which we have put up with wrought iron supports and galvanised iron roof, is a building, and that a portable, sectional stand consisting of wooden uprights and diagonals which we brought from Earl's Court Exhibition, where we used it for our exhibits, and which we have now simply stood up in our yard and put some corrugated iron sheets on top, and screwed them down, to prevent the wind blowing them away, also constitutes a building.

Now, we are in search of a definition of "a building," because the Building Act is silent upon this point, and seems to leave the question of what is to determine a building to the very various interpretations of their officers, and the inconvenience and expense of this uncertainty is meantime thrown upon owners.

Perhaps some of your readers who are well versed in such matters can supply us with a definition as to what really constitutes a building.

J. H. HEATHMAN & CO.

*** Various legal decisions which have been given leave no doubt that any structure which is put up in a permanent manner, and intended to retain its position permanently, is a "building" within the intent and purpose of the Act. According to the general spirit of these decisions the District Surveyor is right.—ED.

DELAY IN COMPLETING STREET PAVING.

SIR,—I beg to call your attention to one of the, so called, advantages of municipal trading.

The Borough of Fulham is now manufacturing a patent stone for street paving purposes from their "destructor" residue. I am interested in 28 houses in Sedlescombe-road, Fulham. The road-making and paving charges in respect of these houses (475*l.*) were paid in advance early in July. The works were not commenced until the end of October. In reply to an enquiry, from the owner, as to when the paving would be completed, the Borough Engineer and Surveyor wrote on December 22 last:

> I have given instructions that the remainder of the footpath which has not been paved shall be covered with ashes and made satisfactory until such time as the flags (which are already made, but need drying and hardening) can be laid. You may be sure that there will be no delay in carrying out this work at the earliest possible moment. In fact, immediately the flags are fit to leave the works they will do so.

Had the paving contract been placed with a contractor the work would long since have been completed, or the Borough Council would doubtless have enforced penalties.

The owner has had the last six of these houses finished and ready for occupation since September last, but has been quite unable to let them on account of the condition of the roads and pavements, and is, consequently, suffering a heavy loss, the rents amounting to 21*l.* per month.

H. S. E. VAN DER PANT.

EASTER HOLIDAYS AND THE BUILDING TRADES.

SIR,—I do not hesitate to answer the first sentence of your correspondent's letter in the affirmative. Easter holidays are, in my opinion, a decided nuisance to all who are engaged in the building trades.

I would venture to assert that nearly, if not all, employers of labour in these trades would gladly welcome the abolition of these holidays for more reasons than one. It means that work is at a standstill from Thursday evening (in a great many cases from midday) until the following Tuesday morning. And then, how many of our large contractors (and small ones too) expect to see the full number of men on the books in their places when the whistle is blown at six o'clock on Tuesday morning? Very often only about one-half turn up the first day after the holidays; on Wednesday perhaps about 75 per cent. are on the job. Thursday may see most of them there (this depends to a great extent as to how much time they have made during the previous week or two); and are the majority of the men who do put in an appearance any time during the week very "fit"? I will leave the answer to your experienced readers. My own experience (about 30 years) is that the Easter holidays unnecessarily disorganise work for at least a week in a busy time of the year, and I heartily endorse all that your correspondent has written.

R. BRICKWOOD.

WATER SUPPLY OF NARBOROUGH, LEICESTER.

SIR,—Where ignorance is bliss, 'tis folly to be wise. I am staying in the village of Narborough, adjacent to Leicester. The inhabitants here derive their drinking water from

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shallow wells, and think (and boast) they have a very fine quality of water. But, seeing that the village pump is in the roadway and the well is in such a position that the surface water from the road must go into it, and that it is opposite a slaughter-house, and is surrounded by earth closets and, possibly, cesspools, and, to cap all, the densely-packed graveyard is 15 ft. above and about 50 ft. away, I began to have my doubts about it, especially as the water contained, after boiling, a large quantity of thick, grey sediment, like cigar ash.

So I sent a sample for analysis to the Medical Officer of Health, who reported it to be "heavily polluted with animal organic matter, and unfit for drinking."

I append the analysis. And now the villagers are afraid that a good supply will be laid on, for which they will have to pay; rather than do which, they prefer to drink the remains of their ancestors. From what I have seen of the surrounding villages, the conditions are the same.

J. D. WALKER.

COPY OF ANALYSIS.

Colour: Rather turbid.
Reaction: Alkaline.
Odour at 120° F.: Perceptible.
Chlorine: 5·9 parts per 100,000.
Free ammonia: 0·003 parts per 100,000.
Albumenoid ammonia: 0·032 parts per 100,000.
Nitrogen (from nitrates and nitrites): Very excessive.
Nitrites: Present.
Opinion.—The sample is contaminated with animal organic matter, and unfit for drinking.
(Signed) J. E. O'CONNOR, M.S.D., P.H. Camb.,
Medical Officer of Health.

OBITUARY.

M. GÉRÔME.—M. Jean Louis Gérôme, the eminent French painter and (latterly) sculptor, died on the 11th inst. of apoplexy. He was born at Vesoul on May 11, 1824, and therefore was 80 at the time of his death, but was still a prominent and energetic member of the Paris social and artistic world. Gérôme came to Paris in 1841, and entered the atelier of Delaroche, subsequently accompanying him into Italy. He exhibited, for the first time, in the Salon of 1847, a picture representing some young Greeks at a cockfight, which obtained a third medal. Among his principal works since that time may be mentioned the reception of the Siamese ambassadors by Napoléon III. (in the Versailles Museum); "The Age of Augustus"; "The Nativity"; "Phryne before the Areopagite Council"; "The Plague at Marseilles"; "St. Martin dividing his Cloak" (in the Church of St. Nicholas des Champs); "Son Eminence Grise"; "The Slave Merchant," a remarkable work, exhibited many years ago at the Royal Academy; "Le Premier Baiser du Soleil"; "La Soil"; "The Sword Dance"; and many others which we have not space to mention. Among his sculptures were the remarkable "Bellona," in ivory, marble, and bronze (also exhibited at the Royal Academy); a "Phryne"; a remarkable work in last year's Salon, a tinted statue of a nude female juggler playing with balls; and various admirable equestrian statuettes, of Napoléon in Egypt, Tamerlane, Frederick the Great, etc. He also modelled the figure of "La Douleur," which surmounts the monument to his son in the cemetery at Montmartre. Napoléon's campaign in Egypt interested him much, and one of his most celebrated pictures is that of Napoléon contemplating the Sphinx. Gérôme was a member of the Academie des Beaux-Arts, and Grand Officier of the Legion of Honour. He was appointed in 1867 Professor at the Ecole des Beaux-Arts. He was a very important figure in Paris society, as well as in French art. He was one of a group of French artists of the last century, of whom Decamps and Vernet were earlier members, who gave one the impression of combining the artistic and the military character. The portraits of Gérôme always suggest the personality of a soldier rather than of an artist.

MR. SAXON SNELL.—We greatly regret to announce the death, on last Sunday morning, at his residence, Lancaster Lodge, Amersham-road, Putney, after a short illness, of Mr. Henry Saxon Snell, in his 73rd year. During the period 1878-91 Mr. Saxon Snell practised at No. 22, Southampton-buildings, W.C., in co-partnership with his sons, Mr. Harry Saxon Snell—who retired from the firm after a few years—and Mr. Alfred Saxon Snell, F.R.I.B.A., under the style of Messrs. H. Saxon Snell and Son. The partnership was dissolved in 1891, when he resumed independent practice during a period of five years, and then relinquished the active pursuit of his profession. He, however, continued to retain a keen interest in all matters relating to the planning of hospitals and their ventilation, and only a week before his death was much occupied with his scheme for solving the problem of hospital sites in London by building in the public parks. Mr. Saxon Snell was elected a Fellow of the Royal Institute of British Architects in 1871, and became a member of the Architectural Association in 1850, being one of its two oldest members. He was the author of "Charitable and Parochial Institutions," and, in conjunction with the late Dr. F. J. Mouatt, of "Hospital Construction and Management," as well as of several papers and pamphlets upon kindred subjects. He was a member of the Council of the Sanitary Institute. In last November he made a liberal donation to the New Premises Fund of the Architectural Association. Mr. Saxon Snell was the son of Mr. George Blagrave Snell, of London; he entered the office of Sir James Pennethorne, and became assistant to Sir Joseph Paxton and of Sir William Tite; he was also, about that time, chief draughtsman in the Science and Art Department, South Kensington. In 1851 he gained the Royal Academy Silver Medal for his measured drawings of the steeple of St. Mary-le-Bow, Cheapside. In, or about, 1866 he obtained his first important appointment as architect to the St. Marylebone Board of Guardians, and carried out the temporary casual wards, which formed the precursor of many buildings subsequently built by him for that Board.

Of Mr. Saxon Snell's principal architectural work, we may mention the following instances, denoting by an asterisk those of which illustrations and plans have been published in *The Builder*: The Boys' School at Wandsworth-common, for the Commissioners of the Royal Patriotic Fund, for which he was, with four other architects, nominated to compete (June 22, 1872*); the Metropolitan Convalescent Home for Children, at Kingston-hill, Norbiton (July 17, 1875*); the Parish Mortuary, Fletcher's-row, Clerkenwell (July 22, 1876*); the Holborn Union Infirmary, Highgate-hill (March 1, 1879*); St. Olave's, Tooley-street, Union Infirmary, opened in 1879; St. George's, Hanover-square, Union Infirmary, 1876; the permanent Casual Wards, Marylebone Workhouse, 1878; the Marylebone (old) Swimming Baths, Marylebone-road, 1874; the St. Marylebone Dispensaries and Relief-stations in Little Union-place and Earl-street, Lisson-grove; and the Infirm Wards and Administrative Offices for St. Luke's Workhouse, in City-road and Shepherdess-walk, as part of the scheme for the reconstruction of the Workhouse buildings (January 11, 1879*). About thirty-five years ago Mr. Saxon Snell began the re-construction of the Marylebone Workhouse; the first portion erected from his plans and designs comprised the first new "chronic" ward blocks, with the laundry and the Guardians' offices on the east portion of the site in Northumberland-street, Marylebone-road (see also *infra*). In 1887 his designs were adopted for a conversion of the front main building of the Aberdeen Royal Infirmary for administrative and clinical purposes only, and for the removal of all the patients into new pavilions at the rear; the plans, together with an entire re-arrangement of the exterior, but leaving the exterior, of the front and main building, were carried out under his firm's and Messrs. W. and J. Smith and Kelly, the City Architects', superintendence (June 11, 1887*). He was architect, jointly with Mr. Alfred Williams, of the Kensington Infirmary, and assisted the late Captain Fowke, R.E., on the Dublin Exhibition. His plans and designs were selected for the proposed Kensington District Schools at Ashford, in 1879, but the dissolution of the Board caused the abandonment of the project. The firm of Messrs. H. Saxon Snell and Son were employed as architects for the extensions and improvements of the Hendon Union Workhouse and Infirmary; the additions to St. Olave's, Tooley-street, Workhouse; the Royal Victoria Hospital at Montreal; and the Forres Hospital, N.B.; for the Holborn Union—the Workhouse in Merton-lane, Mitcham, for 1,000 able-bodied paupers, with quarters for married couples, workshops and gas-works, re-drainage, the Schools at Mitcham, numerous alterations, etc.; there, as he stated in a letter printed in our columns on November 6, 1886, he first, as he believed, adopted the block system in its entirety with open connecting corridors (October 23, 1886*); alterations, with new offices, relief-station, and dispensary, Highgate Infirmary for the Holborn Union; additional provision for 500 beds for the St. Luke's Workhouse in City-road (cited above); new buildings, with workhouse and casual ward blocks at Wallis's-yard, Pimlico, for the St. George's, Hanover-square, Board of Guardians (May 24, 1884*); administrative offices, the Guardians' board-room, relief-stations, receiving-wards, children's wards, married couples' quarters, dispensary, etc., in Fulham Palace-road, for the Fulham Union (February 2, 1889*); the Hospital for the Sick Poor, and Nurses' Home in Rackham-street. Ladbroke Grove-road, W., for the St. Marylebone Guardians (June 25, 1881*); the Out-patients' Department and Nurses' Home and Dispensary, Victoria Hospital for Children, in Tite-street and Queen's-road, Chelsea (June 27, 1885*); the north-west wing and Out-patients' Department, Hull Royal Infirmary (November 7, 1885*); the Medical Relief and Out-patients' Relief Departments, with Guardians' offices, at the corner of Clerkenwell-road and Red Lion-street, for the Holborn Union (December 12, 1885*); the St. Marylebone Mortuary and Coroner's Court, in Paddington-street, N.W. (February 2, 1889*); a continuation of the works for the re-building of old St. Marylebone Workhouse, on the east and and southern parts of the site, embracing the new "able-bodied" wards, women's workroom, the quarters for married couples, and the laundry overlooking the burial-ground in Paddington-street, 1887-8; and some new buildings (1891-2) at the St. Luke's Workhouse in City-road, for the Holborn Union, in addition to those we have already mentioned.

MR. WILLIAM FOSTER.—The death took place on the 11th inst., at his residence, Priestthorpe-road, Bingley, of Mr. William Foster, at the age of 69 years. Mr. Foster was senior partner in the firm of William Foster and Son, builders and contractors, Bingley. He was a director of the Bingley Building Society and the Bingley Sanitary Tube and Lime Company.

GENERAL BUILDING NEWS.

LIBERAL CLUB, TUNSTALL.—It has been decided to erect a new Liberal Club for Tunstall on a plot of land opposite the recreation ground in Station-road. Mr. A. R. Wood, architect, of Tunstall and Burslem, has planned and designed a building, the estimated cost of which, including the land, will be about 2,500*l*.

BUSINESS PREMISES, BELFAST.—New premises have been erected in Cromac-square by the firm of Messrs. Lennon Bros. Mr. W. J. Moore, architect, Belfast, prepared the plans and Messrs. J. and R. Thompson, contractors, Belfast, were chosen to carry out the work. The buildings have a frontage to Cromac-square of 95 ft., to Verner-street of 105 ft., and to Market-street of 105 ft. The ground floor, with the exception of the space taken up by three shops, is occupied by Messrs. Lennon, and comprises the mart, stores, banana and grape houses, offices, and machines. The empties are stored in a mezzanine floor between the ground and first floors. Stabling buildings giving accommodation for fifteen horses are on the first floor, reached by a gangway, and in close communication are placed the harness-rooms, etc. The mart has an area of 4,000 square feet, and has five entrances from Cromac-square and Verner-street. The strong-room leads directly out of the public office. The banana-rooms are formed of non-conducting walls, so that the temperature can be regulated. These rooms are heated on the high-pressure system, as also are the offices, and are regulated so that the different rooms may be kept at different temperatures. The grape-rooms are adjoining the banana-rooms, and are of similar construction. The heating and wrought-iron work were executed by Messrs. Musgrave and Co.; the plumbing, gasfitting, and copper work were done by Messrs. Baxter and Co.; and the electric lighting by Mr. William Little.

SCOTTISH PROVIDENT INSTITUTION, BRISTOL.—The new building which has just been erected on the corner of St. Stephen-street and Clare-street, for the Bristol branch of the Scottish Provident Institution, was occupied on the 21st ult. The ground floor will be occupied by the Scottish Provident Institution, and the rest of the building will be let off in offices. The building is treated in the Renaissance style. It has a base of Scotch red granite, but the rest of the building is in Doulting stone. The dome is of lead, with moulded ribs and panels. The architects were Messrs. Oatley and Lawrence, and Mr. R. F. Ridd was the builder. The building, which throughout is fireproof, consists of a basement, ground floor, and two upper floors, and the interior fittings are of polished teak. There is a marble floor to the public space on the ground floor occupied by the Scottish Provident Institution, and the other parts of the floor are composed of wood blocks. The staircase which leads to the upper floors has a marble dado.

THEATRE, GRIMSBY.—At the last meeting of the Grimsby Corporation Public Buildings Inspection Committee, the only business was to consider the proposed plans for a new Palace Theatre of Varieties in Victoria-street, on the site of the old theatre. The Borough Surveyor (Mr. Whyatt) explained that the plans met everything that was desired by the committee. The pit, which previously was below the street level, was now level with it. There was a grand staircase up to the dress circle, and an exit from the buffet, whilst there were two separate staircases to the gallery, as well as other emergency exits. — The plans were adopted.

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PAVILION THEATRE, NEWCASTLE. — A new theatre, the Pavilion, has been erected in Westgate-road, Newcastle-on-Tyne. The building, which has been designed by Messrs Wylson and Long, of London, was commenced in the early part of this year. The contractors were Messrs. Jacob Parkinson and Sons, Ltd., of Newcastle. The front of the building, which has been executed in stone and red brick, is some 70 ft. in width, and divided into three bays, separated by broad pilasters, finished with semi-circular arches. The following is a list of the firms engaged in the building: Iron construction, marble work, &c., Messrs. J. Tweddle and Co., Newcastle; electric lighting, Messrs. W. Brown and Co., Blackpool; decorations, Messrs. F. De Jong and Co., London.

TOWN HALL, SUTTON COLDFIELD.—At Sutton Coldfield, on the 29th ult., an inquiry was held at the Council House by Mr. W. A. Ducat, one of the inspectors to the Local Government Board, into an application by the Sutton Corporation for sanction to borrow the sum of 4,086*l*., and to appropriate the proceeds of the sale (4,050*l*.) of the old Town Hall and offices in order to defray the cost of the erection of a new Town Hall, and also for sanction for a loan of 1,920*l*. for the erecting of a fire engine station. The Town Clerk (Mr. V. Holbeche) explained the steps which had led the Corporation to undertake the erection of a new Town Hall, these including the proposed sale of the Sutton Sanatorium, now forming the existing Council House, which was acquired by the Corporation in 1902 at a cost of 9,000*l*., and adapted to its present uses at the outlay of another 1,000*l*. Mr. Mason, of the firm of Messrs. Mason and Edison, architects, London, submitted plans of the new Town Hall, which provide immediate accommodation for 650 persons, and would be equipped with reception rooms, retiring rooms, platform, and kitchen. The estimated cost would be 7,649*l*.

METHODIST SCHOOLS, HUCKNALL TORKARD.—New schools have been opened in connection with Trinity Church, situated in the Market-place, Hucknall Torkard. The chief entrance to the schools is by means of a roadway alongside the church, and communicates with a parlour, 31 ft. long by 21 ft. wide, capable of accommodating 120 persons. On the ground floor an infants' room is also provided, measuring 22 ft. by 21 ft., with gallery for 110 children, whilst there are three class-rooms. The assembly hall is on the first floor, access being gained by means of two staircases. This room, which is about 44 ft. by 36 ft., has a gallery on three sides, and is capable of seating 520 persons. In addition, there are three class-rooms on the east side of the hall and two on the south, whilst five more class-rooms are opened from the gallery. By throwing the ten class-rooms open to the hall the total accommodation is 734 adults. There will be two additional class-rooms on the north-east angle of the site, and altogether the class-rooms number eighteen. The heating of the whole premises is by means of hot water piping and radiators. The building has been erected by Mr. J. A. Munks, of Hucknall, from the designs of Mr. A. H. Goodall, of Nottingham.

THEATRE, GREENOCK.—A new theatre is to be erected at the corner of West Blackhall and Ker Streets, Greenock, for the Regent Property and Assets Company, Limited, from plans by Messrs. Boston, Menzies, and Morton, architects, Greenock, Mr. Alex. Cullen acting as consulting architect for the promoters. The house is a two-tier one, and is seated for 1,650 persons. The cost is estimated at between 12,000*l*. and 15,000*l*.

THEATRE, STANLEY, DURHAM.—The Theatre Royal, Stanley, has been erected at a cost of 7,000*l*., from the designs of Mr. William Forster, architect, Stanley. The theatre includes circle, pit, and gallery. There are eight dressing-rooms on the different landings, with bar on the circle. The paintings have been executed by Mr. Phil Davis, of Lancaster, and the construction of the stage has been superintended by Mr. Fred Angus, of Glasgow. The various contracts have been carried out by the following firms:—Joiner work, Mr. T. Mordue, Dipton; plumbing, Mr T. A. Moffitt, Gateshead; slating, Mr. J. Nelson, Sunderland; decorations and painting, Mr. A. S. Arnison, Sunderland; furnishing, Messrs. Snowball and Son, Gateshead; steel construction, Messrs. Wright and Son, Hull; plastering, Messrs. J. Mule and Son, Sunderland.

NEW FLOUR MILLS, VICTORIA DOCK.—A new branch of business is about to be opened at the Royal Victoria Dock in the interests and development of the milling trade. The firms of Joseph Rank, Ltd., of Hull, and Messrs. William Vernon and Sons, of Liverpool and Birkenhead, will expend large sums, as will also another firm, upon the erection of flour mills on a site extending over several acres on the south side of the dock, which has been let to them, respectively, by the London and India Docks Company. Arrangements are to be made for the discharge of cargoes of grain directly from the ships into the mills, and for the delivery of flour into barges and railway trucks, as well as for its conveyance by road to the depôts in London.

RENOVATION OF THE TOWN HALL, JOHNSTONE.—The Town Council have settled contracts for the renovation, heating, ventilation, and other improvements, which are to cost about 1,200*l*. Mr. M'Lelland, Glasgow and Johnstone, is the architect for the work.

SCHOOL, FLEUR-DE-LIS, MONMOUTHSHIRE.—A new school was opened at Fleur-de-Lis recently. The school is designed to accommodate 370 children—210 boys and girls, and 160 infants, and is arranged on the class-room system, with marching hall for the infants, and general assembly lobby for boys and girls. Two playgrounds are provided, and there are store-rooms for each department. The school has been erected at a cost of £4,760 by Mr. John Jenkins, Newport, according to the designs of Mr. R. L. Roberts, architect, Abercarn.

WYMONDHAM ABBEY CHURCH.—The opening of the nave and south aisle of Wymondham Abbey Church, Norfolk, has just taken place. The restoration of the west tower is completed, as well as that of the nave and south aisle; but the north aisle has yet to be restored, and will be commenced at once. The late Mr. W. S. Hicks was the architect for the restoration, and the work has been carried on by the present firm of Messrs. Hicks & Charlewood, of Newcastle. Messrs. Ratee & Kett, of Cambridge, are the builders.

ISOLATION HOSPITAL, FRIMLEY, SURREY.—The Frimley Urban District Council, having made an application to the Local Government Board for sanction to a loan of 2,350*l*., for the purposes of an isolation hospital on a site at Mytchett, the Board directed Dr. E. Petronell Manby, one of their inspectors, to hold an inquiry, which he did recently at the Council Chamber, High-street, Camberley. Mr. F. C. Uren, surveyor, explained the plans.

THE BUILDING TRADE, GRIMSBY.—The building trade, which in 1902 passed through such an extraordinary period of depression, has during the past twelve months shown a welcome revival. In 1902 the complaint was general that there was a lack of big contracts, that employment was irregular, and that the fishing dispute was responsible for this unfortunate state of things. Matters in 1903 were brighter, and all our builders record an improvement. There have been a good few contracts open to tender, some of them big ones, and in this connection it is encouraging to note that local contractors in practically all instances have been successful in securing the work. One of the biggest was the erection of the new County Police Buildings in Brighowgate, which kept a large staff of the workers busy for a considerable time. Then Lord Heneage and Mr. Grant Thorold have provided much employment by the opening up of their estates in the New Cleethorpes district. Road-making and draining have been carried out and the erection of middle-class house property is being rapidly proceeded with. "Down Docks" new smoke houses, rendered necessary by the increasing herring trade, have been constructed, while Messrs. Hewins and Goodhand have been busy pile driving and building at the dock basin for the new herring stage. Extensions to the Police Department at the Town Hall, the completion of the refuse destructor works, the underground balancing sub-station at Riby-square, and the Great Central Railway Company's extensive alterations at the dock head, the building of new bank premises and insurance offices in Victoria-street, have all kept an army of builders busy. At Cleethorpes builders have been active. The new municipal offices, the new chapel in course of erection at the corners of Tiverton and Harrington streets, and the sea wall extensions have all provided work during the year. House property is being built with startling rapidity on the outskirts of the town, new streets, with new houses, occupying sites that little more than a year ago were field and open country. There have been no disputes during the year, and employment has been good. It is gratifying to observe that this desirable state of things is likely to continue well into the New Year.—*Grimsby News.*

MIDLAND RAILWAY STATION, NOTTINGHAM.—Although the new Midland Railway Station in Nottingham is announced to be opened for traffic on Sunday, the 17th inst., it will be some eight or nine months before the whole of the work involved in the scheme is completed, and by that time the expenditure will have run well into a million sterling. In all there are to be six platforms, with nine distinct sets of metals, including independent up and down goods roads. When the new booking offices are opened on the Carrington-street bridge the present suite of buildings in Station-street will be closed, and their demolition proceeded with, whilst at the same time a new footbridge leading into Station-street will be ready for use. Further east another public footbridge is being provided, extending from Queen's-road to Station-street, and upon this subsidiary booking offices are to be erected for the convenience of passengers coming from the London-road district. Upon platforms 1—3 there will be refreshment and dining rooms, waiting rooms, signal cabins, and lavatories; and on platforms 4 and 5 the station master's office, telegraph office, and more refreshment and waiting rooms and signal cabins will be found. The main entrance to the new station is situated on Carrington-street bridge. The west front has a length of 320 ft. and a general height of 40 ft. There is a clock tower, which rises to a height of 72 ft. The cab approach to the station is reached from the bridge level by two wide entrances, and there are the same number of exits, pedestrians gaining access to the premises by means of two smaller gateways, one beneath the clock tower and one to the southern extremity of the main façade. There are also large and small entrances to this carriage annexe, which is roofed with glass, paved with Jarrah wood blocks, and provided with ornamental iron gates, from Station-street and a cab entrance out of Queen's-road. The carriage entrances have high elliptical arches, and at the sides there are rusticated attached columns of an Ionic order with head pediments over. The other archways are finished with rusticated pilasters and a cornice above. The angles of the clock tower are treated with rusticated Ionic columns, surmounted with a semi-circular dome. The interior of the cab approach, which has a width of 56½ ft., has been built of red pressed bricks, having the ornamental parts in red terra-cotta. Leading out of this carriage way there is the booking hall, 104½ ft. by 42½ ft., and this is approached by three circular-headed gateways fitted with glass screens and swing doors. On either side of the ticket office there is a corridor 25 ft. wide, which affords access to a footbridge or gangway, running at the rear of the main hall for its entire length, from which three staircases lead down to the platforms. Three hydraulic luggage lifts are also provided here. On the north side of the booking hall, approached from the corridor by a passage, a cloak-room, 117 ft. long and averaging 35 ft. wide, will be found, whilst near by there is a small inquiry office, where, too, parcels will be received, though the parcels will be principally dealt with in the large new offices erected in Station-street, and which have been already opened to the public.—*Nottingham Express.*

PROPOSED MUNICIPAL BUILDINGS AT SOUTH SHIELDS.—The South Shields Corporation officials have recently been engaged in applying tests to the ground in Ogle-terrace on which it is proposed to erect the new municipal buildings, for the purpose of ascertaining the stability of the foundations. This has been done in consequence of the existence near at hand of a strata of sand, which proved difficult to deal with in the erection of neighbouring edifices. The result has been reported to the Municipal Buildings Committee, and it appears that the settlement has been much less serious than was feared. The area selected for the test was that upon which the tower, which will be the heaviest part of the new buildings, was intended to be placed. Its weight was estimated at 1,500 tons, and it is proposed that it shall rest on a concrete bed or base of a total area of 1,936 ft., so that the weight of the tower, distributed over this area, would be under one ton per square foot. The test applied was equal to five tons weight per square foot, and a gradual settlement took place to the extent of 11 in., but here it ceased. The committee, accompanied by Mr. Ernest E. Fetch, of London, the architect of the new buildings, inspected the site on the 7th inst. Mr. Fetch pointed out that as designed the tower would not be seen from Fowler-street, which is the main business thoroughfare leading towards it, and on his suggestion the committee decided to recommend the council to bring the building 20 ft. forward, although there was some opposition to this on the ground that as much open space as possible should be allowed in front of the buildings. It was also agreed to make a further test of the site nearer to the main road, and this work will be proceeded with without delay.—*Newcastle Journal.*

BUILDING IN SUNDERLAND.—During the past year 419 plans for buildings of all descriptions were submitted to the Building Committee of the Sunderland Corporation, and of this number 390 were approved. Ninety-nine of the approved plans were for new houses, representing 477 houses—105 one story, 45 one and a half stories, and 327 two or more stories. Among the more important buildings which have been erected, or are in course of erection, are a number of schools and places of

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worship, new premises for the York City and County Bank in Fawcett-street and St. Thomas'-street; alterations to the People's Palace, High-street West; the rebuilding of the Londonderry Hotel, High-street West; and the rebuilding of The Bells Hotel, Bridge-street and West Wear-street.

ALTERATIONS, CALVINISTIC CHAPEL, HOLYWELL, FLINTSHIR.—The authorities of the Rehoboth Calvinistic Methodist Chapel at Holywell are about to carry out alterations and improvements to the building, at a cost of something like 2,500*l*. There is to be a new frontage of red Ruabon brick, with Gwespyr stone dressings, and the interior will be rearranged, and new seating accommodation, galleries, etc., provided. The architect is Mr. T. J. Williams, Liverpool.

PROPOSED EXTENSION, BRISTOL WORKHOUSE.—At a special meeting on the 8th inst. of Bristol Board of Guardians, the report of the Committee appointed to consider the accommodation for indoor poor at Eastville Workhouse, was brought up. The Committee stated that they felt strongly that any scheme should provide for the removal from the workhouses of all imbeciles and epileptics now chargeable therein, and when this was done they considered that the existing buildings at Eastville and Stapleton could, with alterations, improvements, and additions, be made suitable for all the other classes of indoor poor who are chargeable to the Guardians. The scheme they now submitted for the acceptance of the Guardians was briefly as follows: To utilise the Stapleton Workhouse, with slight alterations and improvements, for acute sick in the present hospitals, and for aged and infirm, able-bodied women with babies, married couples, casuals, etc., 1,398 beds; to utilise the Eastville Workhouse, removing the wooden structures, in the main building, and three of the five hospital pavilions (wood and iron) and adapting the present imbeciles' block for chronic sick cases, and also erecting four new pavilion blocks for acute sick cases, a special block for lying-in cases, and using the main building for aged and infirm, able-bodied, married couples, casuals, etc., and erecting new receiving wards and porter's lodge, 1,354 beds; to erect a separate building for the accommodation of all imbeciles and epileptics on a portion of the land owned by the Guardians recently acquired from the Committee of Visitors of the Bristol Lunatic Asylum, 724 beds; total, 3,476 beds. With certain alterations at Stapleton Workhouse, the Committee thought that the building would be very suitable for the accommodation of the classes they proposed, viz., acute sick, in the present infirmaries (293 beds); aged and infirm (818 beds); women (10), suckling babies (10), and six married couples in the main building. The estimate of the architect for the alterations and extensions at Stapleton was 6,360*l*., and at Eastville 50,565*l*. The Committee recommended that a separate institution be erected apart from the workhouses for the accommodation of all the imbeciles and epileptics chargeable to the Guardians. The Committee estimated the cost of this institution for imbeciles, which would contain all necessary administrative offices, complete in itself, at 100,000*l*. The report was adopted, and the Committee were instructed to appoint a deputation to wait upon the Local Government Board to explain the plans prepared by Mr. W. S. Skinner.

BOARD SCHOOLS, HARRINGAY.—The new schools in Mattison-road, Harringay, have just been completed. The buildings, five in number, including the caretaker's cottage, have been erected on a site of just over one and a half acres between Mattison and Pemberton roads, Harringay. They are built of red brick, with red-tiled roofs, in the Georgian style. The architects were Messrs. Mitchell and Butler, and the builders Messrs. McCormick and Sons.

PREMISES, TRAFALGAR-SQUARE, LONDON.—On the 7th inst. Lord Strathcona inaugurated the new European Traffic Headquarters of the Canadian Pacific Railway Company in Trafalgar-square. There is a frontage to Trafalgar-square of 54½ ft., and the height from the pavement to the top of the clock tower is 96 ft. The general office on the ground floor is 43 ft. by 32 ft. and 13½ ft. high. In the basement are four strong rooms, a motor room, &c., and there are five stories above the ground floor. The front is of polished granite on the ground floor, and of Portland stone above. An Otis electric elevator runs from basement to fourth floor. The building is fireproof construction throughout, all steel work being encased with concrete. The foundations being on sand, with softer material below, the whole site has been covered with a raft of Portland cement concrete, having rolled steel joists embedded therein. The staircase is lined throughout with marble. The mosaic floor in the entrance bears the company's monogram, and that in the general office the Canadian coat-of-arms. A series of pictures illustrative of the company's railway and steamship services will be inserted in the panels of the frieze around the walls of the general office. The walls of the waiting-room on the ground floor are panelled in oak. The building has been carried out from the designs and under the superintendence of Mr. G. Richards Julian, architect, of Basinghall-street, E.C., by Messrs. Mark Patrick and Son, of Westminster Bridge-road, S.E.

CENTRAL HOMES, NEW MALDON.—Kingston-on-Thames Guardians on Tuesday accepted the tender of Mr. B. E. Nightingale, Albert Embankment, S.E., at 5,757*l*. for erecting new central homes at New Maldon. There were 38 tenders. Mr. W. Hope was the architect.

LIBRARY FOR TEDDINGTON.—On Monday the Teddington District Council adopted a site for a free library on the Elmfield House Estate, and appointed Mr. Cheers quantity surveyor. A letter was read from Mr. Cheers giving details of plans he had prepared, and these were passed. The building will cost about 5,000*l*.

STAINED GLASS AND DECORATION.

WINDOW, WAREHAM CHURCH.—A two-light transom window has just been filled with stained glass in this church, the figures being St. Berin, bishop; St. Aldhelm, bishop (holding in his hand a model of the church); Alfred the Great; and Edward the Martyr. Each of these figures has a scroll over the heads bearing the name in English. This window has been designed and executed by Messrs. Percy Bacon and Bros., of London, and is placed in the church as a memorial of the restoration of the roof, as indicated by a brass below the window with the following inscription: "This window was placed here by the congregation in grateful recognition of the restoration of the roof by J. B. D., a parishioner, October, 1903." At the same time a small two-light stained-glass window, the work of the same makers, was placed above the chancel arch, representing two archangels with instruments in their hands, the colouring richly treated so as to give a pronounced effect between the chancel and nave.

SANITARY AND ENGINEERING NEWS.

WEYMOUTH HARBOUR IMPROVEMENTS.—In pursuance of an Act they obtained in 1898, the Great Western Railway Company will proceed with their new harbour and other works at Weymouth. They intend to supplant the present incommodious harbour, which is mostly used for the Channel Islands traffic, with a new harbour some 70 acres in area, and to construct two breakwaters from the North Fort and the new Admiralty breakwater respectively. Within the new harbour they propose to build two jetties, with warehouses and wharves, and they will also lay down lines of railway for conveyance of coal to vessels of war anchored in Portland Roads from the new dock railway along the Admiralty breakwater.

FOREIGN.

FRANCE.—It is understood that M. Kaempfen, the Director of the National Museums, is about to retire (he is 77 years old), and to be replaced by M. Homolle, the present Director of the French school at Athens.—M. Henry Marcel, the head of the Fine Arts Department of the Government, has decided to decorate the façade of the Tuileries facing the Rue de Rivoli with statues of eminent men. M. Germain has been commissioned to execute those which will be placed in the niches to right and left of the entrance to the Musée des Arts Decoratifs in the Pavillon Marsan.—At the Ecole des Beaux-Arts there is to be an exhibition of water-colours by M. Moisand, a pupil of the atelier Moyaux at the Ecole, who obtained the Prix Chaudesaigues, and has started on his tour in Italy in accordance with the conditions of the award.—M. Cormon has been commissioned by the Government to paint a picture of the reception of the Mayors of France at the Palais d'Elysée during the exhibition of 1900.—The exhibition of the "Artistes Decorateurs" opens this week at the Petit Palais on the Champs Elysées, and will be open for a month. The exhibition has been organised and arranged by M. Dubufe.—The annual exhibition of lady artists has just opened at the Georges Petit Gallery.—M. Louis Boussier has been elected President, for 1904, of the "Societé des Architectes Diplomés."—A Departmental prison is to be built at Belfort, at an estimated cost of 450,000 francs.

GERMANY.—The new Courts of Justice in Berlin are in process of construction; the work has been entrusted to Messrs. Fasquel and Mönnich, and will be carried out at a cost of nineteen million marks.—The French Church in the Gendarmenmarkt is to be restored at a cost of three million marks.—The new Children's Hospital is now completed, and is in use; the architects are Messrs. Diestl and Schmidt.—A bust of Professor Jacobsthal, executed by Herr Grüttner, was unveiled in the Technical Schools at Charlottenburg, in December; Professor Jacobsthal died on January 1st, 1902.—At the entrance of the Heerstrasse a Triumphal Arch is to be erected at a cost of a million marks.—The new Arch-Episcopal Seminary at Freising, designed by Professor Gabriel von Seidl, was opened in October.—Secondary Schools have been built at Krefeld, at a cost of 500,000 marks; a new theatre is to be built by the managers of the Apollo Theatre.—New Post Office buildings, designed by Herr von Zenger, have been opened at Lindau.—The Church of St. Rupert, at Munich, designed by Professor von Seidl, is completed externally; the building is intended to accommodate 3,000 people.—A Sanatorium for German railway servants has been built at Hanover-Münden; the building consists of basement, ground floor, two upper floors, and attics, and as regards plan and situation is admirably suited to the purpose for which it is intended. The plans are by Herr Max Küster.—A second Lunatic Asylum is to be built at Bayreuth.

AUSTRIA.—The Shelter for the Homeless in Vienna has been completed according to the plans of the architect, Herr Fleischer. It is proposed to build a new theatre at Vienna, to accommodate 3,000 to 4,000 people. The building is to be designed by Herr Fellner.

NEW YORK RAPID TRANSIT SUBWAY.—Considerable progress has been made towards the completion of this line, and work is so far advanced that trial trains have recently been running, two storage-battery cars from the Thirtyfourth-street line having been borrowed for the purposes of the experiments. One car was taken into the subway at Canal-street, being run to and fro between that point and Thirtyfourth-street, and the other car was run between Fiftieth-street up to the end of the finished line in Upper Broadway. These trial runs were, of course, merely intended to test the general construction of the permanent way, and some time will necessarily elapse before the system can be tested in a finally completed condition.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Ivor Jones, architect, of Cardiff, has entered into partnership with Mr. T. E. Richards, of Barry, who will carry on practice under the style of Ivor Jones and T. E. Richards, architects and surveyors, 18, St. Mary-street, Cardiff.

ENGLISH v. AMERICAN FURNITURE IN CAPE COLONY.—Mr. E. J. Cattell, Board of Trade correspondent at Cape Town, writing home to the Commercial Intelligence Department, states that the best descriptions of furniture imported into Cape Colony are, in general, manufactured in England, and the American importations are in no case superior in workmanship. On the other hand, American manufactures of this kind are of inferior quality, and, therefore, comparatively cheaper in price. In South Africa (Mr. Cattell continues) there is a greater demand for a lower grade of furniture than is considered to be of the best English quality, and, as a consequence, American furniture is much in favour, and finds a ready sale. The warehouses in Cape Colony do not give any preference to American manufactures; they are very patriotically inclined, and, as far as is consistent with the needs of the country, they place their orders in England. But there are some classes of furniture which are not obtainable in England at the price which finds a ready sale in Cape Colony, and it is in these departments that the American has an advantage over the English manufacturer, more especially in the case of cheap roller-top desks, extension tables, and chairs. It is very satisfactory to be able to report that the furniture dealers in Cape Colony pay the English manufacturer a great compliment in connection with the manner in which orders are executed. Their experience has invariably been that the exact specification of an article required is rigidly adhered to, and the delivery of such orders is made with commendable expedition and accuracy, English firms being in all respects ahead of their American competitors in this class of business. Their agents are uniformly pronounced to be all that is desired in the matter of business capabilities; whilst their courtesy and general willingness to meet the local buyers leave nothing to be desired.

USES OF THE ELECTRIC FURNACE.—In connection with the manufacture of carborundum, a product of the electric furnace, it has been noticed that when the furnace is heated to an excessively high temperature, the carborundum is decomposed, silicon passing off as vapour, while the carbon remains behind as graphite. This observation has suggested the possibility of producing graphite from amorphous carbon

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by the decomposition of carbides; and from a recent issue of the "Journal of the Franklin Institute," we learn that the idea has been developed in a practical manner for the production of graphite for use as paint pigment, lubricants, and in the manufacture of graphite electrodes, which are largely used in electro-metallurgical and electro-chemical processes. Similarly, a process has been developed for manufacture of silicon, which, in spite of the fact that it is one of the most widely distributed elements, has only been obtained in the pure state with considerable difficulty. It can now be manufactured at a reasonable rate by the aid of the electric furnace, and will probably find an extended use in the manufacture of silicon alloys and for other purposes.

"MYCENÆAN" MARBLE.—According to a recent report by the United States consul at St. Thomas, Ontario, important improvements have been effected in the manufacture of Mycenæan marble, an artificial material now used extensively in America in the decoration of halls, houses, hotel lobbies, etc. It is sometimes referred to as coral marble, or coral tiling. The consul himself describes it as "practically a real marble artificially manufactured, and much admired for its columnar and wainscotting effects." The colour effects are considered especially fine, and the durability of the tiles is said to be very great. Another advantage noted is the applicability of the tiling to almost any surface, rough or smooth. The process is said to be a secret one, known only to the inventor, who has sold his rights to a Canadian company.

NEW MOTOR TRAIN.—A novel system of locomotion, invented by Colonel Renard, is fully described in the columns of our contemporary *Le Génie Civil*, and last week was tried experimentally in the streets of Paris. The train consists of a petroleum-driven vehicle, resembling a road-locomotive, but which may, perhaps, be more correctly described as a steering and machinery car, from which motive power is distributed by means of an articulated shaft to all the other cars or waggons in the train. Similarly, the braking of the whole train is effected by means of a jointed rod, suitably connected with all the brakes, which, therefore, are under the control of the driver on the front car. It will be seen from this brief description that the system combines features of considerable novelty, and the distribution of motive power through the large number of driving wheels in the train, cannot fail to give satisfactory results. Further, the application of a continuous brake in the manner indicated, is a decidedly advantageous feature. During the recent trial in Paris, the train was guided with wonderful ease through the crowded traffic, and there ought to be a large field of usefulness open to the invention.

THE ELECTRICAL STANDARDISING INSTITUTION.—As the result of the recent scholarship examinations the examiners recommend the following awards: To H. S. Phillips (Oakham School) an exhibition of forty guineas, tenable for two years; to L. W. Ballard (Dunheved College, Launceston) and G. E. Whitton (Wellingborough Grammar School) exhibitions of thirty guineas, tenable for two years; and to H. R. Ainsley (Masonic School) a special prize of twenty guineas.

HOUSING SCHEME, SALFORD.—At a recent meeting of Salford Town Council, the Health Committee recommended the adoption of a scheme for the erection of tenement dwellings in the Greengate district. The scheme provides for the erection of thirty-eight two-story buildings divided into seventy-six tenements, allowing for four people to a tenement; 304 persons will thus be accommodated. Each of the tenements will consist of a living-room, a bedroom, scullery, and pantry, with various accessories. The total estimated cost, including land 7,890*l.* and buildings 9,883*l.*, is 19,444*l.* Of this amount 2,078*l.* will be payable to the Improvement Committee, who own part of the site. The annual expenditure is estimated at 1,137*l.* 6s. 9d., and the annual income, after allowing for empties (the rental of each tenement being taken at 4s. 6d. per week), at 844*l.* 14s. 9d. On these figures the engineer reports that it will be necessary to make provision for an annual contribution of 292*l.* 12s. from the rates to the sinking fund and interest account. The committee's scheme was adopted by twenty-seven votes to thirteen.

WILLING'S PRESS GUIDE.—Willing's Press Guide for 1904 (J. Willing, jun., Ltd., 125, Strand, W.C.) is the thirty-first annual issue of a very useful and handy index of the Press of the United Kingdom. The work, which is published at 1s., also contains a list of the principal colonial and foreign journals.

ST. MARY, NEWINGTON, CHARITIES.—The Charity Commissioners have framed a scheme for consolidating and readjusting many of the numerous charities and kindred endowments which appertain to this parish. The scheme sets up a body of sixteen trustees, who are charged with the administration of the receipts arising from the Elephant and Castle charity and thirteen other charities, yielding an aggregate annual income of about 4,500*l.*, besides the freehold of the parish almshouses on the John Walter foundation. The first-named charity consists of the "island" plot, on which stand the well-known public-house and ten or eleven houses and shops at the junction of Newington-causeway and Walworth-road. When the charity was founded in 1658 it yielded an income of 5*l.* per annum; the present income amounts to 2,750*l.* yearly, to which should be added the capital sum of 30,000*l.* acquired by way of premium upon the granting of a new building lease of the ground in 1897. The trustees will be authorised to nominate three-fourths of the inmates of the almshouses, to let in allotments—as provided by the Allotments Extension Act of 1882—any portions of the vacant land belonging to the charities, to contribute 300*l.* every year to the Polytechnic Institute in Borough-road, and to apply a sum of 500*l.* yearly towards the provision of nurses for the sick and infirm, and to expend not more than 3,000*l.* in building and equipping a nurses' training institute. The remaining clear annual income is to be applied to the maintenance of almspeople in the almshouse in Hampton-street and to the bestowal of pensions.

ST. KATHARINE'S CHAPEL, MILTON-ABBAS.—This ancient church, which during a long period had served for baser uses, has recently been repaired and reopened for public worship. It consists of a nave and chancel, measuring about 60 ft. by 20 ft., and having very thick walls, which, together with the two doorways and the older of the windows, are of the Saxon or Early Norman type. It is said that the chapel was originally built by King Athelstan upon the spot in his camp at Middleton Hill, in Dorsetshire, where he had received presage of a coming victory over the Danes; he also celebrated his success by founding close by, in 937-8, a religious house for secular canons, which he dedicated to SS. Mary, Michael, Sampson, and Branwaladr, and which, thirty years afterwards, *temp.* Edgar, was converted into an abbey for forty Benedictine monks. Milton Abbey, built after designs by Sir William Chambers, in or about 1772 for the Earl Dorchester, was erected on the site of the conventual buildings. On the west jamb of the south door of the chapel is an inscription concerning indulgences: "Indulgencia: H. Sci: loci: c: e: x: dies"; and on the east jamb is a raised consecration cross of very early workmanship.

THE LATE MR. H. DRU-DRURY.—Adverting to the announcement in our "Obituary" column of last week (p. 39 *ante*), we may state that at a coroner's inquest, held at Greenwich on the 7th inst., the jury returned a verdict of "Accidental death," with an expression of their opinion that the railway company should make the place where the accident occurred more safe.

REGENT-STREET, etc., 1801-1901.—In the article on the history of Regent-street in our issue for January 2 the statement (page 10) that the sale of Hanover Chapel had a capital value of 414,000*l.* seems to have been not quite accurate; it should have been that it was at the rate of 414,000*l.* per acre.

MECHANICAL ENGRAVING AND COLOUR PRINTING.—The Board of Education, in co-operation with the Council of the Society of Arts, intend during the present year to hold, in the Victoria and Albert Museum, South Kensington, an Exhibition of Engravings produced by mechanical means, such as photogravure and other photographic processes, as a sequel to the Exhibition of Engraving and Etching held during last summer; and, as great advancements have been made in printing in colours since the Exhibition of Modern Illustration in 1901, specimens of colour printing will be included. A committee, of which Sir William de W. Abney, K.C.B., F.R.S., will act as Chairman, has been formed to advise the Board in carrying out the exhibition. All communications should be addressed to the Secretary, Exhibition of Mechanical Engraving, Board of Education, South Kensington.

SALES OF PROPERTY.—No. 9, Grosvenor-gardens, S.W., the residence hitherto of Lord Churchill, has been acquired for purposes connected with the convalescent home for officers at Osborne House, Isle of Wight, lately presented to the nation by King Edward VII.—In the course of next month will be offered for sale by auction a portion of the Yorkshire, W.R., and other estates belonging to Lord Crewe, and comprising nearly 7,200 acres, with a total rent-roll of 6,582*l.* per annum, which, having belonged to many generations of the Milnes family, descended to their present owner from Richard Monckton Milnes, first Lord Houghton, who married a daughter of the second Lord Crewe. The estates include Fryston Hall, with 2,000 acres, near Ferry Bridge; Bawtry Hall, on the Nottinghamshire border, a district famed for its quarries of Roche Abbey stone; lands at Great Houghton, near Barnsley; Austerfield, near Bawtry; Penistone, where "Yorkshire flags" are quarried; Goole; Doncaster; Timberland, near Sleaford; Thurlestone, the native place of the eminent and blind mathematician Nicholas Saunderson; Fishlake, on the Don, where Cornelius Vermuyden erected an embankment in 1600; Bullhouse Hall, a fine old mansion in the Penistone coal-mining district; Tapton Hall, Derbyshire, the home of William Milnes, *temp.* Elizabeth; and the Old Hall Inn at Great Houghton, which in the seventeenth century was the manor house of the Rhodes family and the home in her girlhood of the Countess of Strafford.—It is stated that Earl Fitzwilliam has purchased for 85,000*l.* the Duke of Bedford's property, consisting of about 4,500 acres, in the counties of Huntingdon and Northampton, which embrace 600 acres of woodland, the "Bedford Purlieus," famed in the annals of the Fitzwilliam Hunt, and nearly the entire parish of Wansford, situated on the Nene, in the northern portion of the latter county, and traversed by the great North road from London to Stamford and York.—Monkhams, at Woodford, in Essex, which has been placed in the market, forms one of the few remaining properties after its kind near London, and consists of a large mansion standing in a finely-timbered park, extending over 180 acres; it belonged during a long period to the family founded by Sir John Lyon, *temp.* Henry VIII., and was the home of H. Ford Barclay, the banker.—Mancetter, or Mancester, Manor House, near Atherstone, in north Warwickshire, reckons its history from the Tudor period, when it was occupied by the Glover family, of whom Robert Glover, at Coventry in 1555, and Jocasta, wife of Thomas Lewes and widow of Sir George Appleby, at Lichfield in 1557, suffered death for their adherence to the Protestant faith in the reign of Queen Mary I. An apartment in the house is known as the "Martyr's bedroom"; the house, constructed mainly of timber, retains two of its old gables; the middle portion was refronted with brick four years ago. Not far distant lie the Castle-banks and Oldfield-banks, vestiges of the Roman station named Manduessedum by Antonius, and intersected by Watling Street.

IMPORTS AND EXPORTS OF CEMENT.—The imports of cement into the United Kingdom for building and engineering purposes in 1903 amounted to 261,219 tons, valued at 410,396*l.*; in 1902, 240,893 tons, valued at 392,567*l.*; The exports of cement in 1903 amounted to 400,380 tons, valued at 677,740*l.*; in 1902, 303,252 tons, valued at 520,512*l.*; and in 1901, 305,331 tons, valued at 583,974*l.* The exports in the three several years were distributed as follows:—

	1901. Tons.	1902. Tons.	1903. Tons.
To Holland	3,299	2,676	2,472
,, U.S., America ..	8,102	16,801	21,204
,, Brazil	4,818	6,538	3,844
,, Argentina	17,255	17,825	17,930
,, S. Africa	25,453	44,942	80,798
,, East Indies	54,580	52,511	63,360
,, Australia	26,226	21,155	17,766
,, New Zealand ..	19,004	20,032	31,221
,, Canada	17,657	8,642	29,444
,, Other Countries	128,937	113,130	132,341
Total	306,331	303,252	400,380

A HOUSE MOVING FEAT.—An operation, recently carried out at Brown's Station, on the Baltimore and Ohio Railway, is the most remarkable feat in the way of house moving which has come to our notice. The building, known in the locality as the Brown Mansion, has stood for some generations at the foot of the cliffs near the banks of the Monongahela River. Owing to improvements in progress on the railway, the site formerly occupied by this house was sold to the company. Being reluctant to consent to its demolition, the present owner decided to move the house to a new site at the top of the cliff, which is 160 ft. high. As the building measures 85 ft. by 40 ft., and weighs fully 800 tons, it will be understood that the task was not altogether an easy one. The first operation was to insert eight large baulks of timber beneath the building, while beween these and the foundations were placed some two hundred steel girders. Four ledges were then cut in the face of the cliff at intervals of about 30 ft., and as the building was raised by jacks eight walls of timber crib-work were built up beneath it. When the house had been lifted to a sufficient height it was drawn upon the first ledge by means of winches, and, similarly, it was raised from ledge to ledge, until finally landed in safety upon the new site, 200 ft. back from, and 160 ft. above, its former position. We understand that the expenditure considerably exceeded the original cost of the house itself, but the object of the owner was to preserve a valued heritage, and to avoid the destruction of a familiar landmark.

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PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

28,196 of 1902.—F. MILAN and J. MORTON: *Hydraulic Presses for Pressing and Moulding Dry or Semi-dry Bricks or Slabs.*

Hydraulic presses for pressing and moulding bricks, blocks, or slabs from dry or semi-dry material, consisting in the combination of two arms arranged vertically one above the other in the same axial line in separate cylinders, the upper arm carrying dies or stamps and forming the pressing arm, and the lower arm carrying corresponding dies or stamps normally forming the abutments of the moulds, and operating when said arm is raised to discharge the pressed bricks or blocks from the moulds, the inlet valves controlling the admission of water to each end of said cylinder being coupled to the outlet or exhaust valves controlling the exhaust from the opposite ends of the respective cylinders, so that they open and close simultaneously.

28,634 of 1902.—J. TRIPPETT: *Seats and Stools for Outdoor Use.*

In seats and stools for outdoor use the arrangement and combination of parts and appliances by which such seats may be automatically wiped when wet by the movement of a reversible back, which brings into contact with the said seat a "squillagee."

1468 of 1903.—G. W. EASTON: *Outdoor Seats.*

In outdoor seats, the arrangement of mechanism actuated by the uprights of the back rest adapted to turn the seat laths, supported on pivots, half round when the uprights are moved from the vertical into either end position, and of weights or springs, or both, for automatically returning the uprights to their vertical position, and thereby turning the underside of the laths upwards when the seat is vacated.

3221 of 1903.—A. SHERWIN: *Lavatory Basins.*

This invention has for its object to provide, in conjunction with lavatory basins or like articles, an overflow made integral with the basin or receptacle for the purpose of giving the ready access for the cleansing of the said overflow. To this end a table surrounding the basin or receptacle is provided. A portion of this table is sunk or saddled out at its junction with the basin or receptacle so as to form a recess having a perforated floor or platform at a level conveniently below the surface of the surrounding table. A horn or pipe is connected with the sunk portion of the table immediately underneath the said perforation for the purpose of conducting away any water which may rise in the basin above the level of the perforated floor or platform.

3224 of 1903.—L. W. SHARPE: *Locks or Fastenings for Doors.*

A hasp or fastener with which the bolt of a lock engages, constructed with a loose or removable abutment for the lock bolt, which can be released or removed to permit of the opening of the door without operating the lock.

503 of 1903.—C. E. LONG and J. C. IRVINE: *Locks or Fastenings.*

This relates to a lock having a bolt member pivotted to a case or frame upon one part of a structure, and adapted to engage another part of a structure by receiving a rotative angular movement about its pivot axis, in combination with a key-operated lock carried upon and by the bolt member at a distance from its axis, the key-operated lock accompanying the bolt and receiving a rotatory translation movement, thereby bringing said key-operated lock into position so that its key-operated bolt can be caused to engage a bolt hole in the frame when the bolt member is in engagement.

3809 of 1903.—T. S. FORBES: *Rubber Tile and like Flooring or Floor Coverings.*

A rubber-tiled floor covering composed of rubber sheeting formed with boundary lines of tiles, and having in it tile-shaped recesses or depressions, which are filled in with detached and coloured rubber tiles to form a flat surface, the said covering being adapted to be secured to a floor by nails driven through the sheeting under the detached tiles.

7489 of 1903.—W. REUTER: *Overhead Travelling Cranes and the Like.*

An overhead travelling crane or the like, with two superposed tracks and lifting appliances displaceable thereon, the arrangement being characterised by the fact that the lifting appliance, by means of superposed rollers, may be transferred without the employment of switches, turntables, or the like from the fixed track to the movable track, so that it may be displaced with the latter not only at right angles to the fixed track, but also upon it parallel with this latter by continuing its own rolling movement upon the movable track.

10,039 of 1903.—W. PHILLIPS and E. VERITY: *Windows.*

In connection with sliding-sash windows, the device of a hinge attachment, one wing of which is secured to side window frame or staff beading of the same and the other wing formed as a hasp, and a hook or staple attachment secured to the adjoining stile of the sash frame, so that when the sash frame is sufficiently raised the hasp wing can be turned back over the hook or staple of said attachment.

13,565 of 1903.—J. E. HALL: *Moulds and Centerings for Conduits.*

A combined mould and centering for conduits, so constructed that they may be manipulated at one operation, and comprise a trough-shaped body formed longitudinally in sections, hinged together, and means for holding the sections relatively rigid when moulding the conduit and for moving them relatively to collapse the mould to enable it to be moved from the moulded conduit.

17,574 of 1903.—A. H. W. WEDLER: *Devices for Fastening, Adjusting, and Locking Window Sashes.*

A sash fastening device, comprising, in combination, the following parts secured to the lower sash, namely, a barrel, a piston, a quarter eccentric cam piece pivotally attached to the said piston, a coil spring acting to project the said piston, a key-lock upon the said barrel, a key fitting into such lock, and the following parts secured upon the upper sash: A receiver bed, an extension arm adapted to lie horizontally or to be raised erect, a spring for retaining the said arm in its erect position, and a hinge pin which carries the said extension arm and the said spring, and is bored with a fixed receiver hole, the said arm having a series of receiver holes in a vertical line with the fixed receiver hole, and with the piston when said arm is erect, and having also a bevelled receiver lip adapted, when the arm is in horizontal position, to allow the piston to automatically slide into the fixed receiver hole.

21,374 of 1903.—T. H. APPLEBY and J. TYLOR & SONS, LTD.: *Taps or Valves for Lavatory and other Such-like Purposes.*

Taps or valves in which a spout or bib, through which the water or other liquid is delivered, forms the arm or lever by which the tap or valve is opened and closed, which consists in causing the said spout or bib to rise as it is turned in one direction and to fall as it is turned in the opposite direction, and in connecting to the stem of the said spout or bib a valve which is opened by the rising and closed by the falling motions of the said spout or bib.

22,375 of 1903.—W. R. KINNEAR: *Sheet Metal Radiators.*

The subject of this invention is a radiator constructed of sheet metal, and more particularly a double tubular radiator, in which the spaces for the heating medium are formed in the respective units between two tubular members placed one within the other, and having an air flue extending centrally through the radiator. According to the invention, these tubular members are of flattened or elliptical section, and have the space between them closed by deflecting one or both of the members, so as to bring them together at their ends, where they are united by folded seams.

24,041 of 1903.—J. BACH: *Process for Manufacturing Fire Bricks, Crucibles, Retorts, and Other Refractory Articles.*

A process for manufacturing refractory articles, consisting in moulding and pressing chrome-ore, which is freed, by washing or otherwise, from the easily fusible admixtures, together with fire clay, and in burning the same.

24,510 of 1903.—L. SCHLENTHEIM and DIESPEKER, LIMITED: *Mosaic Steps.*

A method of constructing mosaic steps of the "granito" type, which consists in inserting previously formed mosaic segments in a step mould and then filling in.

24,781 of 1903.—R. N. HAIG and W. TOOMBS: *Construction of Fireproof Buildings.*

The construction of floors and roofs in fireproof buildings, consisting in the combination of rolled steel or iron joists, ties, angles, or other sections, and braces or ties consisting of steel or iron rods or bars passed under the bottom flange of each joist, tie, or angle, and their ends clipped over the top or opposite flange of the joist, tie, or angle that is on each side thereof.

24,933 of 1903.—E. E. HARLES and E. A. GUEDENEY: *Arresting Devices for Doors, Gates, and the like.*

Arresting devices for doors, gates, and the like, comprising an exterior part as a fixture in the floor or ground, into which enters an interior tube, with or without rubber at its upper part, under the action of a spring which can be sunk into the tube by pressure, and maintained by one or more stops guided by one or more grooves with angle joints.

25,003 of 1903.—J. W. AREGOOD: *Brick Driers.*

A brick drier, consisting of a collection of parallel tunnels, connected by a flue extending transversely there beneath, and a furnace communicating with the said flue.

24,807 of 1902.—W. P. THOMPSON: *Paving Material or Asphalte, Filling-up Cement, Waterproofing Material, and Paint.*

The manufacture of paving material, asphalte, filling-up cement, waterproofing for walls, flooring, or the like, or composition for making black ornaments or the like, which consists in the use or application of a mixture of "burgy" (the waste sand of glass works) and pitch, with or without the addition of tars, resins, lac, or dissolved varnish gum, and with or without suitable solvents.

27,736 of 1902.—C. W. HINMAN: *Gas Lighting and Heating Apparatus.*

A gas lighting and heating apparatus, consisting of a holder for holding a variable volume of mixed air and gas under constant pressure, a delivery pipe leading from it to the burner, a pump connected with said holder for simultaneously delivering measured volumes of air and gas thereto, air and gas inlets to said pump, means controlled by the volume of mixed air and gas in said holder for regulating the delivery of air and gas thereto, and a motor for operating said pump.

28,028 of 1902.—W. WHITE: *Apparatus for Use in the Construction of certain Partitions and Partition Walls, and certain other Walls and Baths, Tanks, and other analogous Receptacles.*

This invention relates to the improvements in the construction of walls, partition walls, baths, and tanks, which consists in the employment of sawn or other laths of wood formed into frames of convenient size and form, secured in position by the use of temporary struts or supports, and covered with plaster of the kind known as "granite plaster," or other plaster having similar properties.

24,339 of 1903.—E. G. WATROUS: *Flushing Tanks for Water-closets.*

A flushing tank, in which the float or lever is mounted in bearings upon the overflow pipe, and connected with the inlet valve in such a manner as to open the latter as the float descends, combined with mechanism for opening the discharge pipe, latching mechanism holding it in open position as the water is discharged, and devices operated by the descent of the float for closing said discharge valve.

23,438 of 1903.—S. EWING: *A Yard or Road Gully.*

A yard or road gully, with an integral swan-necked or bell-shaped trap entirely exterior to the body of the gully, a straight-topped weir parallel to the side wall of the gully, a funnel-shaped mouth of discharge or outer leg of trap, and an oblong inner leg, with its narrower sides tending inwards at its lower end flush to the sides of an inlet aperture on the body of the gully.

22,651 of 1903.—L. S. FRANKLIN: *Adjustable Scaffoldings.*

This relates to a scaffolding, comprising a pair of hollow poles, having open guide-ways formed in the front face thereof, sliding blocks designed to operate within the said poles, provided with suitable outwardly extending brackets, a platform designed to rest upon the said brackets, and means for adjusting the vertical position of the blocks within the poles.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

TO CORRESPONDENTS.

W. E. R. (Below our limit.)

T. H. (We have not the information before us, and have not time to obtain it for this issue. The City Architect (Guildhall) could tell you.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commiss on to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

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MEETINGS.

FRIDAY, JANUARY 15.

Royal Institution.—Rt. Hon. Lord Rayleigh, M.A., on "Shadows." 9 p.m.

Institution of Mechanical Engineers.—(1) Nomination of Officers for election at the Annual General Meeting on February 19. (2) Paper to be read and discussed: Sixth report to the Alloys Research Committee on "The Tempering of Steel," by the late Sir William C. Roberts-Austen and Professor W. Gowland. 8 p.m.

Institution of Civil Engineers (Students Meeting).—Mr. A. D. Creer on "Pumping and Disposal of Sewage at York." 8 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. C. R. Bonn on "Steel Work Construction." 8 p.m.

MONDAY, JANUARY 18.

Royal Institute of British Architects.—(1) Award of prizes and studentships. (2) Mr. J. Starkie Gardner on "Architecture in Lead," with lantern illustrations.

London Institution.—Mr. M. H. Spielmann on "British Sculpture of To-day," illustrated. 5 p.m.

Liverpool Architectural Society (Incorporated).—Mr. Hastwell Grayson, M.A., on "Smoky Chimneys." 6 p.m.

TUESDAY, JANUARY 19.

Institution of Civil Engineers.—Paper to be further discussed: "The Electrical Re-Construction of the South London Tramways on the Conduit System," by Mr. Alexander Millar. 8 p.m.

Society of Arts (Applied Art Section).—Mr. George Coffey on "Celtic Ornament." 8 p.m.

Institute of Sanitary Engineers, Ltd. (Lectures on Practical Sanitary Science).—Mr. Henry Adams on "Supervision of Works in Progress." 7 p.m.

Royal Victoria Hall, Waterloo Bridge-road, S.E.—Mr. Bennett H. Brough on "Building Stones."

Dundee Institute of Architecture, Science, and Art.—Mr. David Smith on "An Architectural Tour in Italy." 8 p.m.

WEDNESDAY, JANUARY 20.

Society of Arts.—Mr. Thomas Casson on "Organ Design." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Annual meeting of the members. 8 p.m.

Institute of Sanitary Engineers, Ltd.—General Purposes and Finance Committee. 4 p.m. Election Committee, 5.15. Presidential address and paper by Mr. W. H. Maxwell, A.M.I.C.E. 7 p.m.

Institution of Civil Engineers.—Students' visit to the works of Messrs. Elliott Brothers, Lewisham. Train from Charing Cross Station to Lewisham Junction, 1.45 p.m.

FRIDAY, JANUARY 22.

Architectural Association.—Paper by Mr. Maurice B. Adams, entitled: "As to the Making of Architects, with Examples of Draughtsmanship." 7.30 p.m.

The Junior Institution of Engineers (Westminster Palace Hotel).—Mr. J. Fletcher Moulton, K.C., M.P., F.R.S., will deliver his presidential address. 8 p.m.

SATURDAY, JANUARY 23.

Architectural Association.—First Spring Visit, to the offices of the Royal London Friendly Society, Finsbury-circus, by permission of the architect, Mr. John Belcher, A.R.A. 2.30 p.m.

PUBLISHER'S NOTICES.

Nat. Tel., 6112, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXV. (July to December, 1903) was given as a supplement with last week's issue.

CLOTH CASES for Binding the Numbers are now ready price 2s. 9d. each; also

READING CASES (Cloth), with Strings, price 9d. each.

THE EIGHTY-FIFTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence, will be ready on the 22nd inst.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, &c., &c.

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Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

** Stamps must not be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE noon on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS advertising in "THE BUILDER" may have *Replies addressed to the Office*, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH; By post (carefully packed) 1s.

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"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to J. MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder" by *Friday Morning's Post*.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" at railway depôt
Red wire Cuts	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamfered, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamfered, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	29 0	per ton, delivered.
Best Ground Blue Lias Lime	20 6	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fire Clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer in blocks	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality.*

	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube "
6 in. sawn two sides, landings to sizes (unde. 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
" " 6 in. sawn both sides landings	2 7	deld. rly. depôt. per ft. super. deld. rly. depot.
" " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 best seconds "	12 15 0	" "
20 × 12 " " "	13 10 0	" "
16 × 8 best " "	7 0 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 best blue Portmadoc	6 12 6	" "
20 × 10 best Eureka unfading green	15 2 6	" "
20 × 12 best Eureka unfading green	17 2 6	" "
18 × 10 " "	12 10 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 10 0	" "
18 × 10 " "	9 10 0	" "
16 × 8 " "	6 10 0	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depot
Hip and Valley tiles	3 7	per doz. "
Best Broseley tiles	50 0	per 1000 "
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz. "
Best Ruabon red, brown or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 " "
Do. Ornamental do.	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1000 " "
Best Ornamental tiles	50 0	per 1000 " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "

WOOD.

	At per standard. £. s. d.	£ s. d.
Deals: best 3in. by 11 in. and 4 in. by 9 in. and 11 in.	15 10 0	16 10 0
Deals: best 3 by 9	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 3in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0 10 0	more than battens.
½ in.	1 0 0	"
Fir timber: best middling Danzig or Memel (average specification)	At per load of (50 ft. 4 10 0	5 0 0
Seconds	4 0 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0
JOINERS' WOOD.		
White Sea: first yellow deals, 3 in. by 11 in.	At per standard. 23 0 0	£24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
" 3 in. by 9 in.	17 10 0	19 0 0
" Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
" Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	33 0 0	upwards.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¼ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot	0 11 6	0 1 6
1 in. by 7 in. white, planed and matched	0 12 0	0 14 0

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COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered.
*Designs for a New Schools	Govs. of N'c'tle-on-Tyne R.G.S.	100*l.*, 50*l.*, 25*l.*	April 30
*Design] for Reconstruction of Meat Market	Haverfordwest Town Council	20 Guineas	No Date
Wesleyan Sunday School, Sale	J. Taylor, Sec., Stanley Mount, Brooklands, Cheshire.	Not stated	do.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Hartshill Stone for One Year	Banbury Town Council	N. H. Dawson, Borough Surveyor, Town Hall, Banbury	Jan. 18
Nursery Block, Fir Vale Workhouse	Guardians, Sheffield Union	J. Creswick Brameld, Architect, 8 and 10, George-st., Sheffield	do.
Additions, Temp. Church, St. Vincent, Canton, Cardiff	Rev. D. Davies, M.A.	J. W. Rodger, Architect, 14, High-street, Cardiff	do.
Walls and Fences, West St. Leonard's School	Education Committee	C. A. Pigott, Architect, Saxon Chmbrs., London-rd., St. Leonards	do.
450 yds. 9-in. Sewerage, Fisher's-lane District	Alnwick U.D.C.	G. Wilson, Town Surveyor, Council Offices, Green Bat, Alnwick	do.
Street Works	Halifax Corporation	J. Lord, Borough Engineer, Town Hall, Halifax	do.
Fuel Economiser and Steam Engine at Hospitals	Ashton-under-Lyne Guardians	J. Eaton, Sons, & Cantrell, Architects, Stamford-street, Ashton	Jan. 19
Plumbing Work in connection with Water Supply	Mountain Ash U.D.C.	W. G. Thomas, Surveyor, Town Hall, Mountain Ash	do.
Bridge Reconstruction over the Exe, Stoke Canon	G. W. Railway	Engineer, Paddington Station, London	do.
240 Tons Steel Bridge Girders, &c.	do.	do.	do.
Retorts, &c.	Dundee Gas Commissioners	A. Yuill, Gas Engineer, Dundee Gasworks	do.
Fire Bricks, &c.	do.	do.	do.
800 Lineal Yards Stoneware Pipe Sewer	Rhondda U.D.C.	W. J. Jones, Engineer, Public Offices, Pentre, Rhondda	do.
Stoneware Pipe Sewers	do.	do.	do.
*Making-up] North Grove	Tottenham U.D.C.	Council's Engineer, Croft House, High-road, Tottenham	do.
Eighteen Water Closets, Police Cottages, Priory-road	Dudley Watch Committee	J. Gamage, Borough Engineer, Dudley	Jan. 20
Public Convenience, St. Ann's Fort	King's Lynn Corporation	H. J. Weaver, Borough Surveyor, King's Lynn	do.
House, Scotforth, Lancaster	.....	J. Parkinson, Architect, 67, Church-street, Lancaster	do.
Granite, Meriden, Coventry	Meriden R.D.C.	A. Seymour, Clerk, 11, Priory-street, Coventry	do.
Aisles, &c., and Restoration of Claughton Church	.....	Austin & Paley, Architects, Lancaster	do.
Escape Staircase at Schools, Swinton, Manchester	Guardians, Poor of Manchester	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester	do.
Making-up Poynter-road, Bush Hill Park	Enfield U.D.C.	R. Collins, Surveyor to Council, Public Offices, Enfield	do.
Paints, &c.	Cleansing Com., Manchester Corp.	R. Williamson, Supt. of Cleansing Dept., Town Hall, Manchester	do.
Street Works, Porth, Penygraig, &c.	Rhondda U.D.C.	W. J. Jones, Engineer, Public Offices, Pentre, Rhondda	Jan. 21
400 Tons Tramway Steel Rails, &c.	Cardiff Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff	do.
Firebricks, Retorts, &c.	Salford Gas Department	W. W. Woodward, Engineer, Gas Offices, Bloom-street, Salford	do.
Public Convenience, Minerva-street	Glasgow Corporation	Office of Works, 64, Cochrane-street, Glasgow	do.
Widening main rd., between Morriston & Pontardawe	Glamorgan County Council	County Council Offices, Westgate-street, Cardiff	do.
Two Iron Staircases and Balconies	West Bromwich Union	J. W. Allen, Architect, 298, High-street, West Bromwich	Jan. 22
Steel or Iron Coal-lighters	Lords Commis. of the Admiralty	Secretary of the Admiralty, C.N.I. Branch, Whitehall, S.W.	do.
Two Lighters for Oil	do.	do.	do.
Sewer, &c., Bittaford Bridge, Ugborough	Totnes R.D.C.	C. Ellis, Surveyor, Buckfastleigh	do.
Earthenware Pipe Sewers (Contract 1)	Methley U.D.C.	G. B. Hartley, Engineer, East Parade Chambers, Leeds	Jan. 23
Sewage Disposal Works (Contract 2)	do.	do.	do.
Sewering, &c., Back-lane, Willenhall	Willenhall U.D.C.	E. Fellows, Engineer, Town Hall, Willenhall	do.
Kerbing, &c., Bilston Main Road	do.	do.	do.
Isolation Hospital, &c., Dutton	Runcorn R.D.C.	G. E. Bolshaw, Architect, 189, Lord-street, Southport	do.
Clothing Store Works, Workhouse, Queen's-road	Croydon Guardians	F. West, Surveyor, 23, Coombe-road, Croydon	do.
Dredging, Pigeon House Harbour	Dublin Corporation	Engineer's Office, City Hall, Dublin	do.
Verandah, Parr Hall, Palmyra-square	Parr Hall Committee, Warrington	T. Longdin, Borough Surveyor, Town Hall, Warrington	do.
Four Dwelling Houses, Newstead, Halifax	.....	T. Kershaw, A.R.I.B.A., Lancs. & Yorks. Bank Chambers, Halifax	do.
Cornish Boiler, Devonport Workhouse	.....	Workhouse Master's Office	Jan. 25
Entrance Lodge, &c., New Cemetery, North Prospect	Devonport Corporation	J. F. Burns, Borough Surveyor, Municipal Offices, Devonport	do.
Lavatory Works at Workhouse, Dutton, Preston Brook	Runcorn Guardians	W. & Segar Owen, Architects, Cairo-street, Warrington	do.
Abattoir, West Hill, Dartmouth	.....	R. Montague Luke, Engineer, 15, Princess-square, Plymouth	do.
Furniture, Infectious Diseases Hospital, Seacroft	Sanitary Committee, Leeds	T. Thornton, Acting Town Clerk, Leeds	do.
Mortuary Buildings, Crawshay-lane, Penarth-road	Cardiff Corporation	W. Harpur, Borough Engineer, Cardiff	do.
Cast Iron Pipes	Derwent Valley Water Board	E. Sandeman, Engineer's Office, Bamford, via Sheffield	do.
Sewering, &c., of Double Tramways, Leicester-road	Salford Corporation	Borough Surveyor, Town Hall, Salford	Jan. 26
New Road from Leicester-road to Bury Old-road	do.	do.	do.
Refuse Destructor Buildings, &c., Westleigh	Leigh Corporation	T. Hunter, Borough Engineer, Bank Chambers, Leigh	do.
Lustleigh Water Supply	Newton Abbot R.D.C.	S. Segar, Engineer, Union-street, Newton Abbot	do.
Gate, Lodge, &c., Blackrock College	.....	P. H. M'Carthy, B.A., 32, Bachelor's-walk, Dublin	do.
Iron Railings, Gates, and Wickets, Blackrock College	.....	do.	do.
Temporary Schools, Manley Park, Whalley Range	Withington U.D.C., Educa. Com.	E. Woodhouse, Architect, 88, Mosley-street, Manchester	do.
*Enlargement of Sorting Office, Upper Holloway	Commiss. of H.M. Works, &c.	H.M. Office of Works, Storey's Gate, S.W.	do.
Stores, Northfield-road, Crookes	Eccleshall Indus. & Prov. Society	H. L. Paterson, A.R.I.B.A., 19, St. James's-street, Sheffield	Jan. 27
Two Iron Fire Escape Staircases (block 5) at W'khouse	Southampton Guardians	Mitchell, Son, & Gutteridge, Arch's., 9, Portland-st., Southampton	do.
An Iron Staircase, &c., from Tramp Ward	do.	do.	do.
Making-up Oakfield-road	Erdington U.D.C.	H. H. Humphries, Engineer, Public Hall, Erdington, Birmingham	do.
Flags, Kerbs, &c.	Sale U.D.C.	W. Holt, Engineer and Surveyor, Council Offices, Sale	do.
Flags, Kerbs, Gritt Setts, Pipes, &c.	do.	do.	do.
Lamp Repairing Shop, Gateshead Locomotive Works	N.E. Railway	W. Bell, Architect, Central Station, Newcastle-on-Tyne	do.
Office Accommodation, &c., St. Andrew's Dock, Hull	do.	W. Bell, Architect to the Company, York	do.
*Roadmaking Works	Wood Green U.D.C.	Council's Surveyor, Council Offices, Town Hall, Wood Green	do.
*Erection of New Free Library	Boro' of Ramsgate	Town Clerk, Albion House, Ramsgate	do.
*New School at Gorse Hill	Stretford Educational Authority	Frank H. Mee, 32, Victoria-street, Manchester	Jan. 28
Flints, Gravel, &c., for One Year	Hertfordshire County Council	Urban A. Smith, County Surveyor, Hatfield	do.
*Annual Contracts	Lambeth Boro' Council	Boro' Engineers, 246, Kennington-road, S.E.	do.
Steel Girder Bridge, &c., Weedon-street, Brightside	Improvement Com., Sheffield	C. F. Wike, City Surveyor, Town Hall, Sheffield	Jan. 29
Granite, Slag, &c.	Spilsby R.D.C.	T. A. Bushridge, District Surveyor of Highways, Spilsby	do.
Sewering, &c., Grena-road, Richmond, Surrey	Richmond Town Council	J. H. Brierley, Borough Surveyor, Town Hall, Richmond	do.
Dwelling House, Llanfarian	T. E. Owen	J. Lewis Evans, Architect, 21, Great Dargate-street, Aberystwyth	do.
Fuel Oil for Twelve Months	.....	Officer Commanding, A.S.C., Granby Barracks, Devonport	do.
Timber Safety Fencing, Badenoch Division	.....	A. Mackenzie, C.E., Kingussie, N.B.	Jan. 30
Additions, West Mount Ironworks, Halifax	.....	C. F. L. Horsfall & Son, Architects, Lord-st. Chambers, Halifax	do.
Granite and Materials	.....	T. H. B. Heslop, County Surveyor, Norwich	do.
Grit	Norfolk County Council	A. E. Collins, City Engineer, Guildhall, Norwich	Feb. 1
*Power House, &c., Technical Inst., Paddington	Norwich Corporation	Arch. Dept. (General Construction Section), 15, Pall Mall East, S.W.	do.
*Electric Wiring & Fittings, &c., at Norlington-rd. Schs.	L.C.C.	William Jacques, A.R.I.B.A., 2, Fen-court, Fenchurch-street, E.C.	Feb. 2
*Underground Conven. Laying-out Gar. & Pav. Works	Leyton Dis. C. Education Com.	Council's Surveyor, 57, High-st., Acton, W.	do.
*Erection of Public Baths	Acton District Council	Council's Surveyor, Town Hall, Chiswick	Feb. 3
*Erection of Stabling and Disinfecting Station	Chiswick U.D.C.	Town Clerk, Town Hall, Church-row, Bethnal Green	Feb. 4
Engine Room Works, Workhouse Infirmary	Boro', of Bethnal Green	W. H. Hope, C.E., Seymour-road, Hampton Wick	Feb. 8
*New Ward, Laundry, and Additions to Hospital	Kingston-on-Thames Guardians	R. Marchant, Architect, 28, Theobald's-road, W.C.	do.
Alter., &c., Rehoboth Welsh C.M. Chapel, Holywell	Dartford J. Hospital Com.	T. G. Williams, Architect, 52, South Castle-street, Liverpool	Feb. 9
Sewage Works, Roffey and Little Haven	.....	S. Mitchell, Clerk, Market-square, Horsham	Feb. 10
*Supply of Broken Granite	Horsham U.D.C.	Chief Surveyor, Chelmsford	Feb. 15
*New Asylum, Marborough	Essex County Council	Everard & Pick, Architects, Millstone-lane, Leicester	Feb.
*Erection of Epileptic Homes, &c.	Leicestershire, &c. Lunatic Asy.	Giles, Gough, & Trollope, 28, Craven-street, Charing Cross, W.C.	Mar. 4
*Alterations, &c., Union Workhouse	Chorlton & Manchester Asyl. Com.	Naylor & Sale, Architects, Irongate, Derby	No da
Outside Iron Staircases	Shardlow Guardians	Medical Superintendent, N. Riding Asylum, Clifton, York	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
Clerk of Works	Hearts of Oak Benefit Society	Not stated	Jan. 16
General Out-door Foreman	City of Gloucester	2*l.* 2*s.* per week	Jan. 21
Architect's Assistant	Staffordshire C.C. Education Com.	130*l.*	Jan. 25
Architect	Staffs. County Council	150*l.* per annum	do.
Director of Public Works	Orange River Colony	900*l.*, &c.	do.
Architectural Assistant	Barrow-in-Furness Corporation	120*l.*	Jan. 27

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xix.

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WOOD—*(continued)*—
PREPARED FLOORING—*(continued)*—

	Per square. £ s. d.	£ s. d.
1¼ in. by 7 in. white, planed and matched	0 14 6	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ..	7 5 0
Compound Girders, ordinary sections	8 2 6 ..	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ..	8 17 6
Flitch Plates	8 5 0 ..	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ..	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 10 0 ..	8 0 0
Staffordshire Crown Bars, good merchant quality	8 0 0 ..	8 10 0
Staffordshire "Marked Bars"	10 10 0 ..	—
Mild Steel Bars	8 15 0 ..	9 5 0
Hoop Iron, basis price	9 5 0 ..	9 10 0
,, ,, galvanised	17 10 0 ..	—
(*And upwards, according to size and gauge.)		
Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ..	—
,, ,, 24 g.	10 15 0 ..	—
,, ,, 26 g.	12 5 0 ..	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ..	—
Ordinary sizes to 22 g. and 24 g	13 5 0 ..	—
,, ,, 26 g.	14 5 0 ..	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ..	—
,, ,, 22 g. and 24 g.	16 10 0 ..	—
,, ,, 26 g.	18 0 0 ..	—
Galvanised Corrugated Sheets—		
Ordinary sizes, 6 ft. to 8 ft. 20 g	12 15 0 ..	—
,, ,, 22 g. and 24 g.	13 5 0 ..	—
,, ,, 26 g.	14 0 0 ..	—
Best Soft Steel Sheets, 6ft. by 2ft. to 3 ft. by 20 g. and thicker	11 15 0 ..	—
Best Soft Steel Sheets, 22 g. & 24 g	12 15 0 ..	—
,, ,, 26 g	14 0 0 ..	—
Cut nails, 3 in. to 6 in.	9 5 0 ..	9 15 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 0 0 ..	—
Pipe in coils	14 10 0 ..	—
Soil pipe	17 0 0 ..	—
Compo pipe	17 0 0 ..	—
ZINC—Sheet—		
Vieille Montagne ton	26 5 0 ..	—
Silesian	26 0 0 ..	—
COPPER—		
Strong Sheet per lb.	0 0 10½ ..	—
Thin ,,	0 0 11½ ..	—
Copper nails ,,	0 0 11 ..	—
BRASS—		
Strong Sheet per lb.	0 0 10 ..	—
Thin ,,	0 0 11 ..	—
TIN—English Ingots ,,	0 1 4 ..	—
SOLDER—Plumbers' ,,	0 0 6½ ..	—
Tinmen's ,,	0 0 8 ..	—
Plowpipe ,,	0 0 9 ..	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft. delivered.
,, fourths	1½d. ,, ,,
21 oz. thirds	3d. ,, ,,
,, fourths	2½d. ,, ,,
26 oz. thirds	3½d. ,, ,,
,, fourths	3d. ,, ,,
32 oz. thirds	4½d. ,, ,,
,, fourths	4d. ,, ,,
Fluted sheet, 15 oz.	2½d. ,, ,,
,, 21 oz.	3½d. ,, ,,
½ Hartley's Rolled Plate	1½d. ,, ,,
⅛ ,, ,, ,,	2d. ,, ,,
¼ ,, ,, ,,	2½d. ,, ,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes or barrels per gallon	0 1 8
,, ,, ,, in drums ,,	0 1 11
Boiled ,, ,, in pipes or barrels ,,	0 1 11
,, ,, ,, in drums ,,	0 2 2
Turpentine, in barrels ,,	0 3 8
,, in drums ,,	0 3 10
Genuine Ground English White Lead per ton	19 0 0
Red Lead, Dry ,,	19 0 0
Best Linseed Oil Putty per cwt.	0 7 6
Stockholm Tar per barrel	1 12 0

VARNISHES, &c. Per gallon.

	£ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BESTWOOD (Notts).—For the erection of buildings, Forge Mills, Bestwood. Messrs. Sands & Walker, architects, Angel-row, Nottingham :—

W. Pipkin	£656 10 3	W. Brown	£544 0 0
T. Barlow	633 0 0	T. Cuthbert	530 0 0
T. Fish & Sons	625 0 0	T. H. Harper	526 0 0
J. Hutchinson & Sons	573 0 0	G. Baron	525 4 5
F. Measom	566 0 0	W. Maule	525 0 0
J. White & Sons	565 6 0	J. Smith	490 0 0
A. B. Clarke	555 0 0	W. J. Hutchinson	474 18 0
Thompson & Sons	550 0 0	T. Long, Nottingham*	464 0 0

BO'NESS.—For electric light, town hall and library, for Bo'ness Town Council. Mr. J. A. Liddle, electrical engineer, 28, Rutland-street, Edinburgh. Quantities by engineer :—

Jas. Milne & Son, Ltd.	£454 10 0
Robertson & Hogg	392 8 10
National Electric Construction Co., Ltd.	365 13 9
MacLeish, Morrison, & Co., Ltd.	341 2 8
Jas. M. Inglis	337 0 0
Malcolm & Allan	333 7 8
Frew, Watson, & Co., Ltd.	314 0 0
Sinclair, Bo'ness*‡	321 0 0

‡Less 2 per cent.

[These are the total amounts of scheduled rates. There will be a further sum of about £200 for fittings, etc., not included in present schedule.]

BRADFORD.—For additions to central offices, Manor-road, for the Guardians. Messrs. Empsall & Clarkson, architects, 7, Exchange, Bradford :—

Mason and Bricklayer : S. Wray & Co., Coppy Estate, Bradford.*

Steelwork : H. Barrett & Sons, Thornton-road, Bradford.*

Carpenter and Joiner : J. Briggs, Queensbury, Bradford.*

Plumber and Glazier : J. H. Clapham, Bowling Old-lane, Bradford.*

Plasterer and Concreter : A. Taylor, Eccleshill, Bradford.*

Slater : J. Smithies, Horton, Bradford.*

[Total, £6,985.]

BRECON (Wales).—For paving in cement concrete the cattle pens, and construction of new sheep pens, &c., also the construction of a new sewer at Dorlangoch, Brecon, for the Corporation. Mr. H. Ll. Griffiths, Borough Surveyor, Castle-street. Quantities by Borough Surveyor, Brecon :—

Markets Work.

E. C. & J. Keay	£1,287 0 0	W. P. Lewis & Co.	£1,069 0 0
P. Rigby	1,195 0 0	R. L. Williams, Brecon*	999 0 0
J. H. Macdonald	1,143 14 0	Robert Macnab	975 0 0
John Elwell	1,073 0 0		

[Borough Surveyor's estimate, £1,191.]

Sewer.

J. H. Macdonald	£225 0 0	W. P. Lewis & Co.	£172 0 0
Robert Macnab	197 0 0	R. L. Williams, Brecon*	146 16 0
Morgan Bros.	183 10 0		

[Borough Surveyor's estimate, £162.]

COALVILLE (Leicestershire).—For the erection of slaughter house, stables, &c., Ravenstone-road, for the Co-operative Society. Messrs. Goddard & Wain, architects, Station-chambers, High-street, Coalville. Quantities by architects :—

I. A. Wilemann	£1,840 0 0	Griffin Bros.	£1,660 10 0
W. Crane	1,740 0 0	E. Orton	1,616 0 0
B. Baxter	1,675 0 0	W. Moss, Coalville*	1,610 0 0

[Architects' estimate, £1,646 5s. 0d.]

COLWYN BAY.—For the erection of a free library in Woodland-road. Mr. J. M. Porter, architect and surveyor :—

G. Roberts & Bro.	£3,699 0 0	Mark Lane	£3,200 0 0
J. W. Weeks & Son	3,516 0 0	Roberts Bros.	3,196 0 0
S. Bond	3,494 0 0	R. Evans & Sons, Colwyn†	3,105 3 6
Davies & Jones	3,455 15 6	Grundy, Sons & Co.	3,100 0 0
J. Berth Jones	3,310 0 0	R. Evans, Jun.	2,950 0 0

DEAL.—For rebuilding the Five Ringers Inn, &c., for Messrs. Thompson & Son, Ltd., Walmer Brewery. Messrs. W. J. Jennings & J. F. Duthoit, architects, Dover. Quantities by the architects :—

W. J. Adcock	£1,609 8 9	T. T. Denne	£1,387 0 0
E. T. Turner	1,520 0 0	E. Trevers	1,305 0 0
J. E. Hayward	1,515 0 0	G. B. Cotten	1,264 0 0
G. F. Keeler	1,410 0 0	J. E. Turner, Walmer*	1,257 11 0
J. W. Sandcraft	1,400 0 0		

DROYLSDEN.—For street works, Buxton-lane, for the Droylsden Urban District Council. Mr. C. Hall, Surveyor, 10, Ashton-road, Droylsden. Quantities by Surveyor :—

Lawton & Hayes	£563 13 8	H. Fielding, Droylsden*	£492 0 0
F. Mitchell & Sons	495 0 0		

[Surveyor's estimate, £472.]

GARTLOCH.—For additions to nurses' home and alterations to present asylum buildings for Glasgow District Lunacy Board. Mr. Robert Tannock, Chief Master of Works, Parish Council Chambers, 266, George-street, Glasgow. Quantities by Messrs. Robert Scott & Son, 115, Wellington-street, Glasgow :—

Mason, &c., Work : Messrs. Patterson & Baldie, 53, Waterloo-st., Glasgow	£2,350 16 7
Carpenter, &c., Work : Messrs. James Herbertson & Sons, 85, Bedford-street, Glasgow	1,234 0 0
Plumber Work : R. Munro & Sons, 470, Springburn-road, Glasgow	415 0 0
Slater Work : A. Robertson, 31, Argyle-street, Glasgow	173 18 11
Plaster Work : D. & J. McKenzie, 75, Holland-street, Glasgow	265 10 0
Tile Work : Alec. Wilson & Co., 229, St. Vincent-street, Glasgow	216 15 8
Heating Apparatus : R. Munro & Sons, 470, Springburn-road, Glasgow	£131 0 0
Painter Work : James Moodie, 246, Sauchiehall-street, Glasgow	82 6 7

GARTLOCH—*Continued.*

HORWICH.—For 250 tons cast-iron pipes, for the Urban District Council. Mr. M. W. Tong, C.E., Engineer :—

Stanton Ironworks Co., Ltd., nr. Nottingham	3-in. £5 10 0	12-in. £5 1 6	Specials. £10 0 0

HUNSTANTON.—For making up carriage and footways, kerbing, and channelling, &c., Beech Terrace-road, for the Urban District Council. Mr. J. C. Walker, Surveyor, Council Offices, New Hunstanton :—

W. A. Leach	£425 0 0	Edward T. Edwards	£310 10 6
D. Nelson & Co.	327 10 0	F. Southgate, Hunstanton*	253 0 0
Reubam Shanks & Sons	327 0 0		

ILFORD.—For eight 400-gallon water vans for the Urban District Council. Mr. H. Shaw, Engineer to the Council, Town Hall, Ilford :—

W. Glover & Sons, Warwick £396 0 0

ILFORD.—For road works (Hamilton, Harvey, Lockwood, Roman, and Toronto roads) for the Urban District Council. Mr. H. Shaw, A.M.Inst.C.E., Surveyor to the Council, Town Hall, Ilford :—

Parsons & Parsons, 2, High-road, Ilford .. £1,129 14 9

LEATHERHEAD.—For making-up four private roads for the Urban District Council. Mr. T. Salkield, Surveyor, Council Offices, Leatherhead :—

Soan	£1,998 14 8	Lawrence & Thacker	£1,437 1 9
Catley	1,866 7 6	Kitteringham	1,330 6 1
May	1,768 16 2	Adamson*	1,240 3 8
Trueman	1,472 0 0		

[Surveyor's estimate, £1,874.]

For the Tar Paving Work.

Constable, Hart, & Co.	£287 11 4
J. Wainwright & Co.*	271 7 6

LICHFIELD.—For alterations to premises, 14, Market-street, Lichfield, for the International Tea Company's Stores, Ltd. Messrs. George Baines and R. Palmer Baines, architects, 5, Clement's-inn, Strand, London, W.C. :—

	Estimates A and B.	Estimate C.
W. H. Lascelles & Co.	£828 0 0	£68 0 0
W. H. Maxey & Son	805 0 0	42 0 0
Coulson & Lofts	655 16 0	27 10 0
T. Walmesley	592 6 0	49 0 0
Mawer Bros., of Louth*	575 0 0	30 0 0

LONDON.—For the erection of the superstructure of a new Police Court at Clerkenwell. Mr. J. Dixon Butler, Surveyor to the Metropolitan Police, Architect, New Scotland Yard. Quantities by Messrs. Thurgood, Son, & Chidgey, Charing Cross Chambers, Duke-street, Adelphi :—

Foster & Dicksee	£29,435 0 0	Colls & Son	£26,754 0 0
Lascelles & Co.	28,945 0 0	Grover & Son	26,718 0 0
Holloway Bros	27,841 0 0	Holliday & Greenwood	26,563 0 0
Higgs & Hill	27,400 0 0	H. Lovatt	26,415 0 0
Lathey Bros.	27,190 0 0	Greenwood Ltd.	26,225 10 0
F. & H. F. Higgs	27,154 0 0	Ashby & Horner	26,165 0 0
F. G. Minter	26,992 0 0	Lawrance & Son	25,979 0 0
Mowlem & Co., Ltd.	26,884 0 0		

MORTLAKE.—For building new stabling, workshops, &c., and alterations and additions to fire station, High-street, for Barnes Urban District Council. Mr. G. Bruce Tomes, Surveyor, Council Offices, High-street, Mortlake. Quantities by Mr. A. O. Brseds, 62, Lincoln's Inn Fields, W.C. :—

Ford & Walton, Ltd.	£4,955 0 0
H. Blackburn	4,900 0 0
T. Pearce	4,612 17 8
P. Dockerill	4,698 0 0
Williams & Sons	4,570 0 0
A. Leather	4,461 15 11
Cropley Bros.	4,220 0 0
T. Bendon	4,217 0 0
Hughes & Co., Ltd.	4,196 0 0
F. W. Dunkley	4,151 17 0
W. J. Renshaw	4,143 0 0
Soole & Sons	4,100 0 0
Foster Bros.	4,056 0 0
Bailey & Fry	4,050 0 0
Hunt & Sons, 12, Archway-street, Barnes, S.W.*	3,922 0 0

MALDON.—For Tolleshunt Knights Water Supply Works, for the Rural District Council of Maldon. Mr. H. G. Keywood, C.E., Water Engineer, 6, Market-hill, Maldon, Essex :—

Contract No 1.—Supply of Cast-Iron Pipes.

	Per ton. 4-in.	3-in.
Sheepbridge Coal and Iron Co., Ltd.*	£5 8 6	£5 11 0
Staveley Coal and Iron Co., Ltd.	5 10 0	5 10 0
John Abbot & Co., Ltd.	5 10 0	5 12 6
Clay Cross Iron and Coal Co.	5 10 10	5 12 6
Cochrane & Co., Ltd.	5 11 3	5 15 0
J. & S. Roberts, Ltd.	5 12 6	5 12 6
Birtley Iron Co.	5 13 6	5 13 6
Orttewell & Son	5 14 11	5 14 11
Stanton Ironworks Co., Ltd.	5 15 0	5 17 6
Henry Whyte	5 17 6	6 0 0
Cochrane & Co.	5 17 6	6 2 6
Davies, Ball & Co.	6 0 0	6 6 0
A. G. Cloake (socket up)	5 0 0	5 3 6
R. Laidlaw & Sons (socket up)	5 4 0	5 7 6
Biggs, Wall & Co. (socket up)	5 4 9	5 8 3
J. & R. Ritchie, Ltd. (socket up)	5 5 0	5 7 6
T. Allen & Sons	5 5 0	5 8 6
British Mannesmann Tube Co., steel	1s. 6d. pr. ft.	9½d. pr. ft.

Contract No. 2.—Supply of Windmill Pumping Plant.

Canadian Imperial Windmill Syndicate*	£180 0 0	E. S. A. Smith	£170 0 0
J. J. Furlong	136 2 0	E. Roberts, Ltd.	172 10 0
Maldon Ironworks Co., Ltd.	141 7 6	J. Wallis Titt	183 15 0
S. Owens & Co.	160 0 0	R. Warner & Co.	225 0 0
Thomas & Son	160 0 0	Orttewell & Son	228 10 0
E. S. A. Smith	159 0 0	Henry Sykes	230 0 0
,,	162 0 0	Hunswick Bros.	240 0 0
,,	167 0 0	Duke & Ockenden	298 10 0

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MALDON.—*(Contd.).*
Contract No. 3.—Covered Concrete Reservoir.

C. T. Thorn, Tiptree, Kelvedon*	£405 15 9	J. Rayner	£452 3 0
A. Ward	419 13 0	Davies, Ball & Co.	488 2 0
		Ernest West	517 7 6

QUEENSBURY (Yorks).—For the erection of a cemetery chapel, and entrance gateway, for the Urban District Council. Messrs. T. H. & F. Healey, architects, Bradford. Quantities by architects:—

Mason: Jones & Wilcock, Queensbury	£933 0 0
Joiner: Joseph Bairstow & Son, Queensbury	210 0 0
Plumber: Wilson Stocks, Queensbury	64 9 0
Plasterer: Crabtree & Berry, Great Horton	25 10 0
Slater: Thomas Nelson & Son, Bradford	68 0 0
Painter: Tom Hewitt, Bradford	9 10 0

QUEENSBURY:—For earthenware pipe sewers, &c., and for boundary walls and entrance gateway at cemetery, for the Urban District Council. Messrs. John Drake & Son, surveyors, Queensbury:—

Jones & Wilcock, Queensbury £1,185 0 0

SOUTH-EASTERN AMBULANCE STATION.—For additional accommodation for small-pox nurses at the South-Eastern Ambulance Station, for the Metropoiltan Asylums Board:—

C. B. Roberts & Co.	£2,525 10 0	W. Martin	£1,673 0 0
Kirk & Randall	2,314 0 0	T. Cole	1,621 0 0
E. Proctor & Son	2,119 0 0	Johnson & Co. Ltd.	1,610 0 0
J. O. Richardson	2,021 0 0	T. G. Sharpington	1,598 0 0
R. H. Lowe	1,875 0 0	W. Lawrence & Son	1,594 0 0
H. Wall & Co.	1,721 0 0	W. Reason, 47, Rosebery-av., E.C.*	1,547 0 0
Enness Bros.	1,693 0 0		

[Architects' estimate, £1,621.]

TOTTENHAM.—For the erection of a granary and stables, Broad-lane, Tottenham, N., for Mr. W. H. Clench. Mr. Augustine C. Green, architect, 111, Fore-street, Edmonton, and 40, Bruce Castle-road, Tottenham:—

W. Easun	£3,281 9 0	T. Almond & Son	£1,995 0 0
J. Stewart	2,431 0 0	Mattock Bros.	1,997 0 0
F. Bull	2,168 0 0	J. Groves	1,904 0 0
Green & Smith	2,120 0 0	H. Knight & Son	1,867 0 0
A. Fairhead & Son	2,056 0 0	A. Porter*	1,847 0 0

TOTTENHAM.—For the erection of an iron van shed, Broad-lane, Tottenham, N., for Mr. W. H. Clench. Mr. Augustine C. Green, architect, 111, Fore-street, Edmonton, and 40, Bruce Castle-road, Tottenham:—

W. Harfrow	£186	St. Pancras Iron Works Co.*	£149
Humphreys	170		

TOTTENHAM.—For the erection of a block of flats, Bruce Castle-road, Tottenham, N., for Mr. J. B. Warcus. Mr. Augustine C. Green, architect, 111, Fore-street, Edmonton, and 40, Bruce Castle-road, Tottenham:—

H. Knight & Son	£820 0 0	W. J. Bysouth	£600 0 0
Hardy Bros.	817 0 0	W. Hawley*	587 10 0
J. Groves	785 0 0		

WANSTEAD.—For High-street paving, for Wanstead Urban District Council. Mr. C. H. Bressey, Surveyor:—

Adamant Stone Co.	£265 0 0	Imperial Stone Co.	£229 10 0
G. J. Anderson	211 0 0	W. H. L'celles & Co.	263 0 0
T. Adams	245 0 0	E. Lamble	212 0 0
F. Barry, 14, Whitta-road, Manor Park*	185 19 10½	W. Manders	223 0 0
Croft Granite Co.	234 15 6	Patent Indurated Co. (John Elles & Co.)	226 12 0
Empire Indurated	215 0 0	Parsons & Parsons	221 9 8
W. & C. French	240 0 0	G. Porter	228 16 0
B. W. Glenny	211 15 0	W. Thomas	270 0 0
William Griffith	253 13 6	H. Williams	350 0 0
J. Jackson	212 0 0		

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WATFORD.—For making up Watford-road, Northwood, for the Rural District Council. Mr. E. Tailey, surveyor, 9, Market-street, Watford:—

Henry Brown, Watford £450

WHITBY.—For fitting up the Temperance Hall with electric light, and for painting, &c., for Trustees of Temperance Hall:—

Electric Light.

I. Stephenson	£120 0 0	T. B. Watson & Son	£93 16 4
John O'Connor	114 5 2	G. F. Wells	79 10 0
Walker & Hutton	99 10 0	E. Cox Walker, Darlington*	70 0 0

Painting.

Drinz	£110 0 0	F. Hemingway, Whitby*	£82 0 0
G. Trueman	97 12 6		
F. C. Agar	85 10 0		

WOKINGHAM.—For county police station and petty sessional court at Wokingham, Berks, for the Standing Joint Committee. Mr. Joseph Morris, County Surveyor, Reading. Quantities supplied:—

E. F. Lewis & Son	£6,572 0 0	W. J. May	£5,985 0 0
G. Higgs	6,550 0 0	B. E. Nightingal	5,980 0 0
F. R. Chinchen & Co.	6,350 0 0	J. Fergusson & Co.	5,963 0 0
Spear & King	6,345 0 0	F. Pizzey	5,907 0 0
Veale & Son	6,334 0 0	H. W. Godwin	5,795 0 0
H. Searle	6,325 0 0	McCarthy E. Fitt	5,787 0 0
C. Capel & Sons	6,315 0 0	Boxall & Sons	5,714 0 0
Stanley Ellis	6,278 0 0	J. B. Seward	5,708 0 0
G. H. Tucker	6,250 0 0	J. Dallow & Sons	5,598 0 0
Jenkins & Sons, Ltd.	6,245 0 0	J. H. Margetts & Sons	5,594 0 0
Peerless, Dennis, & Co.	6,230 0 0	W. Hawkins	5,586 0 0
East & Hyde	6,165 0 0	E. C. Hughes, Wokingham*	5,564 0 0
G. Pilgrim	6,104 0 0	G. Browne	5,551 0 0
G. S. Lewis & Bro.	6,100 0 0	C. W. Cox & Sons	5,505 0 0
G. Kemp	6,069 0 0	H. Charman	5,500 0 0
E. Chamberlain	6,040 0 0	W. Watson	5,496 0 0
W. Culver & Sons	5,992 0 0		

[County Surveyor's estimate, £5,654.]

WREXHAM.—For erecting a showroom, Salop-road, for Gaslight Co. Mr. M. J. Gummow, architect, Wrexham. Quantities by the architect:—

W. E. Samuels	£1,090 0 0	Davis Bros., Hill-street*	£1,036 0 0
Lewis Bros.	1,066 0 0		

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The Builder.

VOL. LXXXVI.—No. 3181. JANUARY 23, 1904.

ILLUSTRATIONS.

Interior of Hall, "Bishop's Mead," Hampstead ..... Mr. G. Ernest Nield, A.R.I.B.A., Architect.
Competition Design for South Wales University College, Cardiff:—
Elevations, Sections, Plan ..... By Mr. John Belcher, A.R.A.

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Students' Drawings at the Institute.

THE drawings sent in competition for the various prizes offered to students by the Institute of Architects are at present on view to the public at the large room of the Alpine Club. The designs for the Soane medallion are hardly equal in average merit to those of the last two years, when the subjects, it must be remembered, were exceptionally attractive and suggestive. This year's subject, "A University Theatre on an Open Site," does not convey quite such a distinct idea as to what is required, as those of either a monumental Swimming Bath or a Town Church (the two preceding subjects), and a good many of the competitors seem to have taken rather too ambitious a view of the problem, and produced designs which are more in keeping with a "manufacturing centre" than with the quiet and refinement which should characterise the buildings of a University town. The circular form of plan seems to have been rather a favourite, and this is a mistake, as such a plan does not express the conditions of a building where there is to be a platform for special dignitaries at one end or side of the room and the remainder is an auditorium; and a circular plan, moreover, seldom results in a building which is acoustically good for speaking.

The author of the design which has obtained the medal, Mr. F. J. Horth, has adopted a long plan with an apse at each end, the one at the further end containing the platform; at the sides are columned recesses, above which are galleries. The plan is one of the best, probably the best, and the manner in which the various small subsidiary apartments are worked in on the exterior boundary of the plan is ingenious—perhaps a little too much so. The design is Classic, with a columned portico and a good deal of rustication, and the building is roofed somewhat after the manner of St. Sophia, with semi-domes over the apses. The interior perspective is a clever drawing and looks well, only we do not like the rather disturbing outline of the central decoration. The exterior treatment is correct Classic without very much refinement, an impression perhaps increased by the thickness of line used in the drawing. But the sense of unity of scale is much better in this than in most of the other designs, and we quite agree with the award. The "Honourable mention" design, "Gable Endie," by Mr. David Smith, shows an inner plan in a complete circle, with one portion of the area arbitrarily cut off for the platform, which is not at all an architectural method of planning. What gives value to the design is the treatment of the exterior, in which also rustication is largely employed; it has some picturesque and original points, and is more refined in treatment than the selected one; the detail elevation is perhaps the best thing among the Soane drawings, though the plan is decidedly inferior to Mr. Horth's.

Among the other Soane designs that signed "Jonah Man" shows a very ambitious set of drawings, with a plan with a large semi-circular recess on each face—a very bad form of plan practically, since many of those seated in the side recesses could only see a speaker who stood at the very front of the platform. The large dome is, in its treatment, entirely out of scale with the substructure. "Rotunda" shows a clever set of drawings betraying French influence, especially in the well-executed interior perspective, which, however, is quite out of keeping with the idea of English University architecture. The plan is a complete circle with a corridor outside and square annexes. The exterior design is pretty but rather gewgaw in character, and shows again, as in so many of the others, the want of definite ideas in regard to scale.

The subject for the Tite prize was "A Crescent in a large City"; we presume that there was a further instruction that the crescent should be considered as pierced by two streets symmetrically placed at each side of the centre axis, as all the designs show that feature. Mr. Heaton Comyn's design, to which the prize has been awarded, is in the main the best, and is shown in a charming set of drawings, including a finely worked out detail elevation besides the artistic perspective sketch in pencil. The streets are spanned by wide rusticated arches, above which is a colonnaded loggia; the order shown in this is continued by pilasters along the remainder of the façade. The ground story, more than half the height of the whole façade, is in plain rusticated masonry, the order occupying the upper portion of the height. The façade is perhaps a little too nearly divided, vertically, into two equal halves, but that is about the only criticism that need be made, the whole design being one which would do credit to any architect. A semi-circular

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formal garden is laid out on the central area, with a tower or campanile on the centre of the chord. The author has taken the commendable trouble of giving the complete plan of the buildings forming the ground story, so as to show how the design could be practically utilised. A medal of merit is awarded to the design marked "Porthos," by Mr. A. D. Nicholson. Here the ground story is lower in proportion than in the prize design, thus avoiding the division of the height into two halves, but the heavy and massive order, engaged columns in the central block and pilasters in the side ones, rather crushes the ground story. The attic is treated in a monumental manner with square windows and very large triglyph piers, rather too large in scale for the rest of the design, but nevertheless this portion of the front has a solid and massive effect, and the whole set of drawings is a very creditable one. We share, however, the surprise expressed on another page by our correspondent Mr. Spiers, that such a design as "Red Shield" should have been passed over with no recognition. It at all events runs the prize design very close, and is unquestionably superior to any other in artistic feeling. The façade shows an open colonnade of coupled columns above the street arches; the central block is emphasised by a picturesque central pavilion, with sculptured figures above the cornice, echoed by smaller central features in the side blocks. "Bydand" shows a good general conception, though weak in drawing and detail.

The Grissell medal, given for "A Timber Spire or Lantern Termination to a Tower," we suspect has been partly awarded for the artistic merit shown in the drawings by Mr. W. Hepburn; a merit which we fully appreciate; but it should be remembered that the Grissell medal was founded to provide for the study of construction, and that ought to be the main consideration in the award. Mr. Hepburn shows a perspective sketch of a plain square stone tower of great height, pierced by small openings and crowned by a timber lantern in oversailing stages, with a smaller octagonal lantern rising from it. The drawings are beautifully executed, and the manner in which colour is introduced in the timber work is admirable; the whole set of drawings is most artistic and the greatest credit to its author, and all the construction is conscientiously shown; but we cannot help feeling that this vertical building up of timber staging is an easier constructive problem than that of a lofty timber spire, such as is shown in Mr. Barclay's design, to which a medal of merit has been awarded. The exterior design in Mr. Barclay's drawings, though very well and carefully set out, is no doubt commonplace in comparison with that of Mr. Hepburn, but then the Grissell prize is for construction and not for design. We have noticed a considerable tendency during the last two or three years to impart an æsthetic element into it, which is all very right, but that should (in this particular case) be a secondary matter. Mr. Barclay's spire construction is very well and thoughtfully carried out, but in this and one or two other sets of spire designs we are tempted to ask whether the apex of the spire is tied down into the centre of the structure as scientifically and effectually as it might be. "Oak" shows a creditable piece of construction: but his short struts abutting against blocks which are kept in their place by a screw-bolt through the timbers, form a weak point, as the thrust is really a shearing strain on the bolt. The blocks should have been notched into the bearing timber. On the whole, the Grissell designs are a highly creditable set, and there is no doubt that the prize lay between the two that are placed first, but we are not sure that their positions should not have been reversed.

The Arthur Cates prize of forty guineas, given for certain specified classes of drawings submitted by those who have passed the Institute Final Examination at one sitting, has not been fully awarded this year, the best man, Mr. Winton Newman, having been awarded half the value of the prize, twenty guineas. We do not know in what particulars Mr. Newman was considered to have been deficient; but looking at his exhibited drawings we should think that the winning of the prize has been made rather unnecessarily difficult, if these are not considered adequate: they are certainly a most creditable set. Mr. Baxter Greig has an Honourable mention in the same competition, for drawings which include a good design for a Late Classic Town Hall.

The Owen Jones travelling studentship has this year gone to the wrong man—from the architect's point of view. It is true that a painter would probably have chosen the set by Mr. W. Davidson which has been awarded the prize, but the prize was not intended for a collection of pretty pieces of colour; it was intended for the serious study of colour applied to architecture. This the drawings by Mr. W. Davidson are not. They are fine enough studies, in their way, of scraps of decoration. Portions of Rood screens from Norfolk, fragments of pavement from Florence, and single lights of stained glass windows make the bulk of the work; the only complete schemes of decoration shown are of two Elizabethan tombs of small importance. The drawings are moreover not well drawn, and in the case of the Della Robbia over-door the colour is also untrue and bad. In our opinion the work of Mr. James Maclachlan, which receives no award, should have won the studentship. The colours are certainly somewhat crude; but as illustrations of remarkable subjects they are well chosen and valuable as records. The Mosque at Cordova is worth the time and labour expended upon it, and the man who has studied in that way is more likely to benefit by extended travel than the collector of pretty fragments. The roof of Blythburgh Church, Suffolk, is a beautiful drawing of coloured decoration, suitable for the climate and for purposes of the present day. Mr. H. Morley receives a medal of merit, presumably for his drawing of the enamelled terra-cotta altar-piece attributed to Andrea della Robbia; his figure drawing is simple, clear and accurate—the best of any shown. The water-colour sketches are less happy, being rather untidy and restless in colour. Mr. L. R. Guthrie shows excellent measured work from Venice and Granada, but seems to us to have spoilt his chance by submitting an original design, the architectural lines of which are of poor proportion, and the colour decoration patched on to it in an unconvincing way. A set of drawings made entirely in England, either of English subjects or of foreign examples at the national museums, is shown by Mr. Lishman; they show a nice feeling for colour, but the handling of the sketches is not very deft, and they show a rather unpleasant yellowness running through them.

The prize involving what used to be thought the most fascinating work of all is that for the Pugin Studentship. At present, however, the study of Gothic buildings is not in so much favour as those of a later period; without entering into the controversy of styles, the facts are indicated by there being only two competitors for this prize—the third places himself out of court by illustrating only Jacobean work. But Mr. F. C. Mears well deserves the prize he has won with so little opposition. He shows a representative collection of studies of Gothic architecture that have evidently been a pleasure to him to make: they are not brilliant drawings, but informing studies well chosen. Some of the instances of domestic architecture are attractive, and it is a pity that the sketch of Great Aessingham, Norfolk, is so slight, for it suggests a most unusual house of the Gothic period. Part of Pershore Abbey is shown with good measured drawings, and some beautiful font covers. Mr. W. S. A. Gordon gets a medal of merit for a set of clever drawings, the author's delight being evidently rather more in the drawings than in the architecture, and probably for this reason the measured drawings are the most satisfactory.

The drawings will remain on view at the Alpine Club till the 30th inst., from 10 a.m. to 8 p.m. We hope that some of the outside public, as well as the architects, will think it worth while to go and see what our architectural students are doing. They should find much to interest them in the exhibition.

A NOTE ON MODERN WOOD-CARVING.

WE are induced to make some remarks on this subject mainly in connexion with the publication of an excellent little book,* a better book than in these days the public has any right to expect on such a subject as wood-carving. The tendency of manufacture and commerce—the whole tendency, indeed, of science and civilisation—has been for a long time well-nigh fatal to the existence of handicrafts and the lesser arts. It is strongly characteristic of this tendency that the poet whom, of all others, his own and this generation have delighted to honour, is said to have invested his patrimony in a business the object of which was to produce wood-carving by machinery. But, curiously enough, the poet's insight,

* Wood-Carving: Design and Workmanship. By George Jack. London: John Hogg. 1903.

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though super-added to that of the business man, was in this instance deceived, and the poet lost his capital. It is true that French cabinet-makers produce a substitute for wood-carving that is stamped in sawdust and blood; but they have not yet monopolised the market, and wood-carving is still a handicraft. It is a handicraft, moreover, of which there are still masters, such as the author of this admirable book, whose work will compare favourably with that of the greatest of their predecessors; but, like all other handicrafts which have not yet been actually displaced by mechanical agencies, this of wood-carving already exhibits the premonitory symptoms of their fatal influence.

Consider an example of wood-carving in its simplest form—the cutting of short rounded chamfers such as are frequently seen upon Gothic furniture, or upon country carts and waggons of the present day. Set a good and conscientious joiner from a builder's workshop to the cutting of such chamfers, and instead of leaving them crisp and vigorous, with the polished marks of his chisel, he will finish them off with spoke-shave, scraper, and glass-paper, each the exact facsimile of every other, until it is almost impossible to distinguish his handiwork from the productions of a good machine. So it is also with the average wood-carver properly so-called. He is one of the few remaining craftsmen whose work has not been taken out of his hands by the development of a mechanical industry, and instead of feeling the privilege of his position, it would seem that he wishes for, and courts, the catastrophe that has befallen his brother workmen. In the execution of geometrical or conventional patterns, though his work is not done by a machine, he would fain make it seem that it were. He aims above all things at superficial finish, mathematical exactness, monotonous repetitions and symmetries. He seems to hanker after glass-paper and French polish; he would fain remove the last minute traces of that manual labour of which he is apparently ashamed. When he aspires to the treatment of natural forms the same desire for exactness and finish leads him into mistaken attempts at an impossible realism by which his art is immediately vulgarised and debased; and he is further encouraged in these errors by a public taste which is vitiated, like his own, by the abominable wares of our modern manufacturing capitalists.

Through all the earlier and more practical part of Mr. Jack's book these difficulties and dangers by which the young wood-carver is beset seem to be almost wholly ignored. Until the last two or three chapters one would imagine in reading that all was well with the craft, and so admirable are the instructions given, with respect both to workmanship and design, that if only the author could have his way with readers and pupils all might be well indeed. But the fault, and almost the only fault that we have to find with this excellent book, is that the author does not seem sufficiently determined to have his way with his audience; it is as though he lived and wrote in a golden age of the handicrafts; he does not set himself resolutely to counteract those tendencies already alluded to, by which, as by a strong tide, the young wood-carver will be swept away so soon as he grasps the chisel. That this complacency is not due to any failure of insight into the present conditions of the craft is, however, abundantly proved in the last two chapters. These contain not only a fascinating picture of the country craftsman of old times, but a perfectly clear and sufficiently heart-rending analysis of the changed conditions under which the modern wood-carver lives and works, with such generally poor results. The absence, therefore, of negative emphasis or militant criticism in the earlier part of the book must be ascribed, we suppose, to that serenity of temper which may still be enjoyed by the craftsman who knows that his own work, at all events, is above reproach.

In its affirmative aspect, as we have already said, the book is entirely admirable. The absolute necessity that the craftsman should make his own designs, and this with due respect to the limitations of his art, and to the destined position, use, or application, of the work before him; the superlative importance of "texture" in wood-carving, and of the distribution of lights and shades; the intimate co-relation of wood-carving with the other architectural arts; all such great principles as these are strongly insisted on, and the executive processes of the craft are well and clearly described. The value of the book, moreover, is immensely enhanced by the numerous and excellent illustrations; and its literary quality is greatly superior to that of the average text-book.

NOTES.

The Garden City. THE recent meeting of the Garden City Association was hopeful in its tone, but, much as we wish success to the enterprise of establishing on the three thousand odd acres of Hertfordshire what the promoters rather fancifully call a garden city, we still have grave doubts as to the scheme. It may well be that with a good train service an agreeable and not expensive collection of habitations for City clerks and others may be established. The Baroness Burdett-Coutts was able to create something of the kind in Holly Village, Highgate. It is, however, a different matter to unite a business centre to a pleasant rural suburb in one place. Sunlight City, as it is called, is a collection of dwellings the property of a single company, but the garden city in Hertfordshire is to be a city of various miscellaneous people on an ideal system. However, when the project is more fully developed we shall be able to speak of it more definitely.

Building Materials in Egypt. A RECENT report of the British Chamber of Commerce in Egypt contains some useful hints for many business men in this country. It points out what a large amount of private and public building is taking place at the present moment in Egypt, and that the British manufacturer is not taking full advantage of the opportunities now offered to him. For example, Belgium and Germany have a practical monopoly of the trade in steel joists, and the same story is told in regard to lead and iron piping, sanitary goods, paints, and oils, and ironmongery for doors and windows. Lifts, it is mentioned, are supplied almost entirely from Italy. It would appear that the English goods are too expensive, and possibly of too high a quality for the purpose for which they are required. That English goods for building purposes should be of first-rate quality is very satisfactory, and if the English manufacturer does as large a business in them as he desires, there is no reason why he should supply inferior goods at a smaller cost. If, however, he is knocked out of the Egyptian market not because he does not care for it, but because he will not adapt his goods to it, he has only his own want of energy to thank.

Engineering Standards Committee. ONE of the most useful publications of this body is a report by Professor W. C. Unwin. This document deals with the variation of percentage of elongation with different gauge lengths and sections of test bars. It is generally admitted that for any given test bar the total elongation is made up of two parts, one due to general extension between the gauge points, which is proportional to the length, and the other to local contraction, which is practically independent of the length of the bar. But it has not been so commonly recognised that the elongation due to local contraction depends on the cross section of the bar, and that for a given gauge length the percentage of elongation must vary with the cross section, and increase for a given gauge length as the cross section increases. There would be no difficulty in comparing the elongation of different test bars, if general elongation alone were measured before local contraction commenced. But this could only be done by taking an autograph diagram for every test, a procedure impracticable in ordinary testing. The tests undertaken by Professor Unwin covered a wide range of conditions, and the results afford valuable data, such as have never before been available in so complete a series. The report will certainly be of great service in helping the committee to determine the most suitable proportions for standard test bars, but, apart from this point, the records possess a distinct value of their own.

The Inventor of Portland Cement. VERY few of the thousands who make use of Portland cement, and still fewer of the millions who benefit by its use, have ever heard of Joseph Aspdin, the inventor of a material to which we owe many of the great engineering works of the present day. Aspdin was a Leeds brick-maker who, in 1813, conceived the idea of combining chalk with clay from the river bed, drying and calcining the mixture at a high temperature. In the year 1824 he patented the invention, and soon afterwards opened a small cement manufactory at Wakefield, and a few years later his son William Aspdin established a cement factory near Chatham. The peculiar advantages of the new material were soon recognised by engineers, and Brunel was one of the first

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to make use of it, employing Aspdin's patent cement in the construction of the Thames Tunnel. It is true that rival claimants have arisen to claim the honour of inventing Portland cement, but it is now recognised by competent authorities, not only in this country, but also in France, Germany, and Italy, that the palm belongs by right to Joseph Aspdin. In other departments of work, there is a commendable readiness to recognise the services of those who have contributed to the advancement of science and art, but at the present moment Aspdin is literally a forgotten genius. The suggestion is now made that a public memorial should be raised in Leeds to the inventor of Portland cement, and we feel sure that this proposal will meet with the hearty support of architects, engineers, and contractors in all parts of the world.

The First Modern Ship Canal.

IN these days of ship canals we hear little or nothing about the earliest enterprise of the kind during modern times, namely, the Berkeley and Gloucester Ship Canal. Although Gloucester is situated on the Severn, access to the port is really afforded by the canal. Owing to the dangerous condition of the river, an Act was obtained in 1793 for the construction of a ship canal commencing at Berkeley, some sixteen miles lower down the Severn, and the works were completed in the year 1827. This waterway follows the Vale of Berkeley, originally commencing with a tidal-basin and lock at Sharpness Point and ending at the docks in Gloucester, where there is another lock communicating with the Severn. The original cost was about 500,000*l.*, but within the last forty years considerable outlay has been incurred in opening a new entrance half a mile lower down the river, with additional dock accommodation. These works were finally completed in 1874. Although vessels of more than 600 tons cannot pass up the canal to the port, ships of 2,500 tons can enter the outer basin, where cargo is transferred to barges. The dimensions of this ship canal may be small compared with more recent developments, but its continuously successful operation has certainly had some useful effect in the encouragement of more ambitious schemes of the same kind.

Raising a Sea Port.

THE city of Galveston, one of the most important seaports of the United States, is situated on a low, sandy island so little above the sea level that the arduous undertaking of raising the entire area is about to be commenced. A great sea wall has already been constructed, and the filling which is to raise the city level by no less than 7 ft. will require the delivery of some eleven million cubic yards of sand over an area of nearly two square miles. It is proposed that the material shall be procured by hydraulic dredging, and operations will be facilitated by the construction of a distribution canal at the back of the sea wall. This scheme represents one of the most determined efforts hitherto made to overcome the natural disadvantages of a site, and the operation will certainly be watched with interest. Judging from recent, as well as from previous, experience, something of the same kind is very much wanted at St. Petersburg.

Induction Motors.

THE paper by Dr. Behn-Eschenburg on induction motors, an abstract of which was given to the Institution of Electrical Engineers last week by Dr. Silvanus Thompson, is the first really valuable paper on the subject which has appeared in English. The author is the engineer to the famous Oerlikon Machine Works in Switzerland. Many of their machines are in use in factories and central stations in this country, and many of our ablest engineers have served their apprenticeship with this firm. The paper gives evidence of the exceedingly careful manner in which all machines turned out by this firm are tested before leaving the workshop, and Dr. Behn-Eschenburg has placed at the disposal of engineers the results of long and expensive tests on the effects produced by slight alterations in the design of induction motors. The history of the gradual evolution of the induction motor from Faraday's experiment of the effect of placing a metal cube in a rotating magnetic field is one of the best examples of the practical difficulty there is in saying who is the first inventor of a machine. One improvement inevitably led to another, and the very long list of patents in connection with induction motors show the number of electricians that have worked at it. We were sorry that the author did not give more data in connexion with single phase motors. The number of three-phase supply systems in this country is still very limited, and so the design of three-phase motors interests only a few manufacturers. From the point of view of the mathematician, there is a great deal to criticise in the paper. It is difficult to find out what the author means by self induction and mutual induction. The terms have not their usual meaning, and the formulæ he gets appear to us to have an extremely limited application. We think it a great mistake of the Institution to discourage authors introducing proofs of mathematical formulæ into their papers. It is true that only a few engineers would understand them, but the mere proving of the formulæ would necessitate accuracy of definition, disclose unwarrantable assumptions, and prevent illogical deductions. The value of the formulæ given in this paper would have been immensely increased if the simple proofs, which are not yet published in any English book, had been given. The translation of the mathematical symbols into English has been badly done, and a little judicious editing would have made this paper invaluable to the electrical designer.

Middlesex County Records.

A JOINT committee of the Court of Quarter Sessions and the Middlesex County Council propose to publish a volume, covering the interval 1689-1709, of a calendar which they have prepared of the sessions books for the period 1689-1760, and thereby to resume the labours begun by the late Middlesex County Record Society. The issue will be limited to 500 copies, and sold at the actual cost price of 13s. the volume. As the undertaking is not of a commercial character, it is hoped that the entire issue will be subscribed for, so that the committee may be enabled to accomplish their project. The County Records begun with the reign of Edward VI., and, in pursuance of a decision given by the High Court of Justice some years ago, have been committed to the custody of the Custos Rotulorum of Middlesex; they are now stored in specially constructed muniment rooms in the Westminster Guildhall. Under statutory powers obtained in 1898 the cost of repairing, restoring, binding, and calendaring the records can be defrayed out of the County rate, but the committee are of opinion that the printing and publication of the calendar should be made to pay for itself, and should not fall upon the rates.

Royal Academy Lectures.

THE second of Professor Clausen's lectures on Painting, dealing with "Lighting and Arrangement," was so interesting, both in its matter and its illustrations, that the allotted hour came to an end before one expected. Premising that the greatest difficulty of painting lay not in the execution of this or that detail, but in the marshalling of the whole, and giving some quotations from Leonardo's treatise on painting showing the importance that artist attached to *rilievo* (*i.e.*, modelling by light and shadow), Professor Clausen went on to remark that it was possible to arrange the personages and objects in an interior so as to emphasise, by lighting, what it was wished to emphasise — Velasquez's "Maids of Honour" being given as an example, showing also the frequent arrangement of light and shadow being massed on either side of a diagonal line, a device illustrated also in a beautiful example of Corot. Outdoor sunlight was often a difficulty, as figures could not in painting show in high light against a daylight sky, though it might be done in evening light, as was shown in Titian's "Sacred and Profane Love."* In sunlight, painters had to take advantage of cloud-shadows and other incidents of shadow to bind the scene together and emphasise special figures; or a high horizon might be taken and the sky entirely suppressed, as in Bastien-Lepage's "Les Foins," in order to concentrate the highest light on the faces. Much might be learned by noticing how nature appeared at unpremeditated moments. Too much effort must not be spent on mere imitation of separate incidents; all painting was a partial statement, and each artist had his own form of compromise with nature. The Flemish painters seemed to have looked closer at their models than the Italians, and excelled in minute detail and texture, but did not give so broad and general a conception as the Italian painters, who, with less careful painting of texture, appeared to have considered their subjects at a greater distance and in a wider air. Thus Holbein's "Ambassadors" was a work splendid in each part, but not complete and balanced as a whole. Then it must be remembered that the incidents which were but indis-

* So called; it is very doubtful whether this was really the idea intended in the painting.

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tinctly seen in nature were not to be further elaborated in a picture. Painting dealt with appearances, not with facts, and it was the drawback of photography that it showed what the eye could not see, and thus destroyed the balance of natural effect. It was a curious fact that photographers, in their wish to put photography on the footing of an art, were actually now endeavouring to get rid of this hard accuracy of fact, and to imitate in their productions the uncertain appearances of nature.

Royal Academy Lectures—continued.

In his third lecture, on Monday last, Professor Clausen considered the subject of Colour, which he said had a power of poetic suggestion in itself, independent of subject. We never saw colour as it really is, but as affected by contiguous colours. Every colour tended to produce its complement on contiguous surfaces, except violet, which seemed to possess a quality of spreading its own colour over surrounding objects. Our range of pigments was not equal to the range of light. If a portrait were painted of a man in evening dress, the white shirt front would be the high light; but if he wore a diamond stud, that could not be represented without sacrificing the white of the shirt front, as we had nothing brighter than white in pigment. So it became a question, often, whether the light on the landscape should be sacrificed to that of the sky, or the contrary. Where lights were warm shadows were cool, and *vice versâ*; but the warmth of effect produced by sunlight was sometimes overlooked in painting, and we had sunlight landscapes with no effect of sunlight in them. Latterly the effort to combine light and colour had led some painters to a system of painting entirely in separate spots of colour, but this had led to exaggerated effects. Light, however, could only be expressed in pigments by contrast: Thus Turner painted a dark tree against the sky to render the sky luminous, and the dark foregrounds in old landscapes were introduced for the same reason. *Quality* in colour was an important element, difficult to define but easily felt. Two painters would spread the same blue over a canvas: one would give the impression of blue sky, the other only of blue paint. In water-colour quality almost made itself, but in oil painting the artist had to make his own quality. Colour had an emotional power: Rembrandt's sad golden tone in itself appealed to the imagination; but in these days we were more literal, and endeavoured, like Velasquez, to find the colour in nature as it existed. Chardin, Manet, and Millais were among the most successful modern artists in this respect. There were two methods in building up the colour scheme of a picture; the simple one of laying on the right colour at once, or that of laying a foundation of lights and darks in monochrome, and partially glazing over with colour. The advantage of the latter was that if colour faded to some extent, the balance of light and dark was still preserved. Colour was the quality which availed most to rank a picture among masterpieces [we should think this a little open to question—it must not be pushed too far, at all events]. In conclusion, Professor Clausen said that many people were pleased with a portrait or a landscape in proportion as it seemed to them "exactly like nature." But nature did not give up everything; and the study of painting by those who were not painters would lead them to see that there was much more in nature than could be represented by attempts at literal imitation.

Mr. Spielmann on Modern Sculpture.

At the London Institution, on Monday last, Mr. Spielmann gave an interesting discourse upon modern sculpture. Sculpture, which on the whole ranks first among the arts to-day, appeals to a much smaller public than painting, and lectures that make known its aims are therefore to be desired. While expressing some of the aims of the sculptor, Mr. Spielmann quoted Michael Angelo's dictum that "the more sculpture looked like painting the worse it was, and the more painting looked like sculpture the better it was." A comment on this was Mr. Clausen's recent remark to the students at the Royal Academy, mentioned in our note on his lecture last week, that with the introduction of shadows the painter's difficulties began. Michael Angelo's saying is a good working one, and was made obvious at once by the illustrations thrown on the screen. These included a view of Mr. Brock's model for the Queen Victoria Memorial, which has hitherto been seen only by a few of Mr. Brock's personal friends. Mr. Brock came in for unstinted praise at the lecturer's hands, only perhaps surpassed by his admiration for the works of the late Lord Leighton and Mr. G. F. Watts. While admitting Mr. Frampton's great ability and all-round knowledge, his methods came in for less enthusiasm; the lecturer at the outset deprecated colour in sculpture and the use of more than one material. We do not ourselves approve of some of the liberties that Mr. Frampton has taken with the architectural setting and decoration of his work; but we think any materials or combinations of materials are legitimate in themselves, and if precedent is needed, are we not right in saying that the Greeks coloured their sculptures, Pheidias' brother being a colourer of sculpture by trade? Mr. Frampton has done a good deal to draw the arts together. Sculpture and architecture have been too long divided; it would indeed be difficult to write of them together in modern works; but if it were done, Mr. Frampton's and Mr. Harry Bates' names would be most prominent among the sculptors. When civilisation begins to require an architecture that will attract men of the calibre, say, of Mr. G. F. Watts, to follow it as their calling, Alfred Stevens's saying—"I know only one art," will be less of a curiosity to the general public.

The Women's International Art Club.

There is an exhibition of women's work at the Grafton Galleries, and, as is usual with women's paintings grouped together, the result is unsatisfactory. What good can come from collecting a large quantity of mediocre paintings, simply because they are the work of women, we fail to see. Surely no woman who is a good artist would be afraid of competing with men; if her work is not good enough for a general exhibition let her give up painting. Many of the paintings are almost entirely deficient in colour; there seems to be a fashion amongst lady artists, especially those studying abroad, of making dull-looking pictures, landscapes without sunlight, and portraits of people with unhealthy complexions. One turns with a sigh of relief to such pictures as "The Village Green" and "Sunshine and Shadow," by Mrs. Mary G. Hunter, and the three French scenes by Mdlle. Anna Boch, which, though rather "spotty," are brilliant bits of colour. There is also in the same room a pleasing portrait group of two girls, by Miss Gwenny Griffiths. Miss Alice Robertson, an English lady painting in Paris, sends several pictures; the only one we care for is "All is Vanity," an old woman with an expressive face holding up a necklace, a young woman in the background. "The Mother," by Miss Gertrude Leese, has a good effect of light, and Miss Marie Naylor's portrait of Miss Coombe is pleasing. Why should Mrs. Charlotte Mura want to paint such a vulgar thing as "When the Cat's away the Mice will Play"—two housemaids singing and playing on their mistress's piano? The Long Gallery is given up to water-colours, and the works of each artist grouped together. Those of Miss Evelyn Howard, Miss E. H. Adie, "Thunder Clouds," by Miss E. M. Lister, and some by Nancy Knaggs (Mrs. Arthur Copping) are amongst the best. Among the sculptors is Miss Rope, who sends some panels. Miss Emmeline Halse's two children, "Tired Out" and a "Victim to Art," are charming, as also are Miss Gwendolen William's contributions. There is a case of bookbindings, some needlework, and jewellery.

Mr. Elgood's Exhibition.

The exhibition of water-colour drawings of "Gardens," by Mr. G. S. Elgood, at the gallery of the Fine Art Society, is a most fascinating one, and the artist may be congratulated on having made a progress of continual improvement in the treatment of his chosen subject, from one year to another, till in the present exhibition his work may be said to be perfect of its kind. These water-colours combine brilliancy of colour and minuteness of workmanship in the masses of flowers shown in the foreground in many of them, with delicate painting of sky and distance where distance is introduced; and when we come on a drawing entitled "St. Peter's, from the Pincio" (28), we find that Mr. Elgood has not contented himself, as some landscape painters would, with a shapeless dab of colour for the distant building, but gives quite a careful and finished little study of it in miniature; and in all the drawings in which architecture is introduced it is well and carefully treated, as again in the "Madonna del Sasso, Lago Maggiore" (43), where the middle distance is occupied by a picturesque and delicately treated pile of building. As to the majority of the subjects, which are purely and entirely garden scenes, Italian and English, they are all so good that we can hardly profess to make a selection of the best. The artist has fairly made garden painting his own.

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THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE sixth general ordinary meeting of the Royal Institute of British Architects was held on Monday at the Rooms, 9, Conduit-street, W., Mr. John Slater, B.A., in the chair, in the unavoidable absence of the President, Mr. Aston Webb, R.A.

Registration of Architects.

On the motion of the confirmation of the minutes of the last meeting of the Institute, when the question of the registration of architects was discussed,

Mr. G. A. T. Middleton asked whether the resolution which was eventually passed was in order, seeing that the original resolution as it appeared upon the minutes was not seconded, and that the resolution eventually put from the chair was not in the words proposed by Mr. McVicar Anderson.

The Chairman said Mr. Middleton was right on one point, and he would alter the minutes to the effect that the resolution which Mr. Middleton had proposed was seconded. But who seconded it?

Mr. Middleton said the resolution seemed to be seconded by several persons.

The Chairman said the minutes would be amended to the effect that the resolution was duly seconded. On the other point raised by Mr. Middleton, the minutes were absolutely correct. Whether the meeting intended to vote upon the resolution or not he could not tell, but the President entirely endorsed the correctness of the minutes—as minutes. That being the case, he could not allow any alteration of that resolution, for it absolutely stated what occurred. If there was some mistake it would have to be rectified at another meeting by a counter resolution.

Mr. Middleton asked if the resolution, as carried, was valid.

The Chairman said it was undoubtedly valid at the present moment.

The Late Mr. Saxon Snell.

Mr. Alex. Graham, Hon. Secretary, said he regretted to announce the decease, at the age of 73, of Mr. Saxon Snell, Fellow, elected in 1873. Mr. Snell had a very large practice in connexion with various metropolitan boards of guardians and other public bodies, and was particularly identified with the building of infirmaries, washhouses, casual wards, and like buildings in and about London. He retained to the last a keen interest in all matters relating to the planning and ventilation of hospitals. He asked every member of the Institute to agree to a vote of condolence to be sent to the representatives of the deceased, expressing the sense of the loss the Institute had sustained.

The vote was agreed to in silence.

Prizes and Studentships.

Mr. Locke, the Secretary, read the Deed of Award of prizes and studentships for 1903-4 made by the Council in writing, under the common seal.

The Deed of Award, made under seal pursuant to by-law 66, states that the Council have examined the works submitted for the Institute Silver Medals, the Soane Medallion, the Owen Jones and Pugin Studentships, the Godwin Bursary, the Tite Prize, the Arthur Cates Prize, and the Grissell Gold Medal, and gives particulars of the competitions and the results thereof as follows:—

The Royal Institute Silver Medals.

(i.) *The Essay Medal and Twenty-five Guineas.*—Eight essays on "The Delineation of Architecture" were received for the Silver Medal, under the following mottoes:—

1. Alpha. 2. "Ars longa, Vita brevis." 3. Bothwell. 4. "Floreat semper fidelis civitas." 5. "Fortuna sequatur." 6. "Resurgam." 7. "The 9th." 8. X.

The Council regret that they are unable to award the Medal, but they have granted a Medal of Merit and Ten Guineas to the author of the essay bearing the motto "X" [Claude Batley, Ipswich].

(ii.) *The Measured Drawings Medal and* 10*l.* 10*s.*—Twelve sets of drawings were sent in of the various buildings indicated, and under mottoes as follows:—

1. Archer:—6 strainers (St. Paul's Church, Deptford).
2. Baydo:—5 strainers (Morden College, Blackheath).
3. Caylix:—6 strainers (St. George's Church, Hanover-square).
4. Conger Eel:—4 strainers (Lady Chapel, Lichfield Cathedral).
5. Dolphin:—5 strainers (Church of St. Oswald, Ashbourne, Derbyshire).
6. En avant:—3 strainers (The Queen's House, Greenwich).
7. Erin:—4 strainers (St. Nicholas Church, Old Shoreham, Sussex).
8. Gothic:—5 strainers (Tideswell Church, Derbyshire).
9. Steeple-Jack:—6 strainers (Christ Church, Newgate).
10. Thane:—6 strainers (Glamis Castle, Forfarshire).
11. The Birds:—5 strainers (Priory Church of St. Mary and St. Blase, Boxgrove, Sussex).
12. Vis:—6 strainers (St. James's Church, Piccadilly).

The Council award the Silver Medal and Ten Guineas to the delineator of the Church of St. Oswald, Ashbourne, Derbyshire, submitted under the motto "Dolphin" [L. M. Gotch, West Ealing, W.], and certificates of Hon. Mention to the delineators of Tideswell Church, Derbyshire, and St. James's Church, Piccadilly, submitted under the respective mottoes of "Gothic" [G. S. Salomons, Manchester] and "Vis" [C. Lovett Gill, Regent's Park].

The Travelling Studentships.

(i.) *The Soane Medallion and* 100*l.*—Fourteen designs for a University Theatre were submitted, under the following mottoes:—

1. Aspirant:—7 strainers.
2. Dom:—6 strainers.
3. Gable Endie:—5 strainers.
4. Hal:—6 strainers.
5. Ionian:—5 strainers.
6. Jonah Man:—7 strainers.
7. Oxon:—7 strainers.
8. Phœnix:—7 strainers.
9. Rannock:—5 strainers.
10. Rotunda:—7 strainers.
11. Sanctus Boscus:—7 strainers.
12. Star (device):—4 strainers.
13. Tay:—7 strainers.
14. X:—7 strainers.

The Council have awarded the Medallion and (subject to the specified conditions) the sum of 100*l.* to the author of the design bearing the motto "Oxon" [F. J. Horth, Hull], and a Certificate of Hon. Mention to the author of the design bearing the motto "Gable Endie" [D. Smith, Dundee, N.B.].

(ii.) *The Owen Jones Studentship and* 100*l.*—Five applications were received for the Owen Jones Studentship from the following:—

1. W. Davidson:—6 strainers.
2. L. R. Guthrie:—6 strainers.
3. James M'Lachlan:—6 strainers.
4. Frank Lishman:—6 strainers.
5. H. Morley:—6 strainers.

The Council have awarded the Certificate and (subject to the specified conditions) the sum of 100*l.* to Mr. W. Davidson, Edinburgh, and a Medal of Merit to Mr. H. Morley, S. Kensington, S.W.

(iii.) *The Pugin Studentship and* 40*l.*—Three applications were received for the Pugin Studentship from the following:—

1. A. E. Bullock:—2 strainers.
2. W. S. A. Gordon:—6 strainers.
3. F. C. Mears:—6 strainers.

The Council have awarded the Medal and (subject to the specified conditions) the sum of 40*l.* to Mr. F. C. Mears, S. Kensington, S.W., and a Medal of Merit to Mr. W. S. A. Gordon, Hither Green, S.E.

(iv.) *The Godwin Medal and* 65*l.*—Two applications were received for the Godwin Bursary from the following:—

1. H. Phillips Fletcher:—6 strainers.
2. F. R. Hiorns:—6 strainers.

The Council have awarded the Medal and (subject to the specified conditions) the sum of 65*l.* to Mr. H. Phillips Fletcher.

(v.) *The Tite Certificate and* 30*l.*—Eleven designs for a Crescent in a large City were submitted under the following mottoes:—

1. Anglicé:—3 strainers.
2. Antiquum Obtinens:—3 strainers.
3. Bridge:—3 strainers.
4. Bydand:—3 strainers.
5. Colonnade:—3 strainers.
6. Canny Alnwick:—2 strainers.
7. Crescent (device):—3 strainers.
8. Fleur-de-Lis (device):—3 strainers.
9. Pecksniff:—3 strainers.
10. Porthos:—3 strainers.
11. Red Shield:—3 strainers.

The Council have awarded the Certificate and (subject to the specified conditions) a sum of 30*l.* to the author of the design bearing the motto "Bridge" [Heaton Comyn, Great Ormond-street, W.C.], and a Medal of Merit to the author of the design bearing the motto "Porthos" [A. D. Nicholson, Glasgow].

The Arthur Cates Prize: 40*l.*—Four applications for the Arthur Cates Prize were received from the following gentlemen:—

1. J. H. Gibbons:—11 strainers.
2. Baxter Greig:—15 strainers.
3. F. Winton Newman:—11 strainers.
4. John Swarbrick:—18 strainers.

The Council regret that they are unable to award the Prize, but have granted the sum of twenty guineas to Mr. F. Winton Newman, Hampstead, N.W., and a Certificate of Hon. Mention to Mr. Baxter Grieg, Dulwich, S.E.

Prize for Design and Construction.

The Grissell Gold Medal and 10*l.* 10*s.*—Fourteen designs for a Timber Spire or Lantern Termination were submitted under the following mottoes:—

1. Cardon:—3 strainers.
2. Carpenter:—1 strainer.
3. Celt:—1 strainer.
4. Dew:—2 strainers.
5. Eihera: 3 strainers.
6. Ich Dien:—2 strainers.
7. Le Nord:—1 strainer.
8. Mente Manuque:—2 strainers.
9. Oak:—3 strainers.
10. Opal:—2 strainers.
11. Simplex:—2 strainers.
12. Skyline:—3 strainers.
13. Wee Macgregor:—3 strainers.
14. Yddraig Goch:—1 strainer.

The Council have awarded the Medal and ten guineas to the author of the design bearing the motto "Cardon" [J. W. Hepburn, Patsull-road, N.W.], and a Medal of Merit to the author of the design bearing the motto "Ich Dien" [A. Jas. Barclay, Aberdeen, N.B.].

The Ashpitel Prize 1902.—The Council have, on the recommendation of the Board of Examiners (Architecture), awarded the Ashpitel Prize to Mr. F. Winton Newman, of London. Mr. Newman was registered Probationer in 1895, Student in 1897, and passed the Final Examination in November, 1903.

The Travelling Students' Work.

Soane Medallist 1902.—The Council have approved the drawings executed by Mr. James B. Fulton, who was awarded the Medallion in 1902, and who studied in Italy, Gibraltar, Algiers, Malta, Egypt, Palestine, Turkey, Greece, Austria, Hungary, and Germany.

Tite Prizeman 1902.—The Council have approved the work of Mr. Charles Gascoyne, who was awarded the Tite Prize of 1902, and who travelled in Italy.

Tite Prizeman 1903.—The Council have approved the work of Mr. David Smith, who was awarded the Tite Prize for 1903, and who travelled in Italy.

Pugin Studentship 1903.—The Council have approved the work of Mr. J. Harold Gibbons who was elected Pugin Student for 1903, and who travelled in Gloucestershire and Somersetshire.

Lead Architecture.

Mr. J. Starkie Gardner, F.S.A., then read a paper on "Lead Architecture," of which the following is an abstract:—

The author first gave some details of the lead-mining industry in Britain since the earliest times, and referred to the use made of the metal in architecture by the Greeks in the Mycenæan period. The metal has specially valuable properties that distinguish it from all other metals. Capable of producing the most delicate and lace-like effects, or of covering with an impervious sheath the most extensive buildings, it equally defies the ravages of time and the corroding influences of air or of water. It succumbs to the attacks of fire alone. Under the murky pall of our great cities its hue deepens to a sombre black, but if weather-beaten in purer air it oxidises to a silvery white, producing contrasts of light and shade which are exquisitely beautiful. Formerly richer effects were obtained by gilding and painting in chevrons of colour or powdered devices, or by varying the surface with inlays of tin, or incising patterns and filling them with minium, white oxide, or black asphaltum. It quickly tarnishes, but freshly melted or cleaned its surface is lustrous as silver; and this might perhaps be preserved by coating it with vitreous glaze dissolved in fluoric acid.

The Greeks first applied lead decoratively in architecture. An Ionic capital from the Temple of Ephesus, in the British Museum, has its volutes inlaid with a fillet of lead. The idea of inlaying lead into stone may have reached the Anglo-Briton, the most expert metal-worker of that time, from the East. William of Malmesbury describes an ancient pavement in Glastonbury Abbey as formed of "stones designedly inlaid with triangles and squares and figured with lead." The finest existing example of fourteenth century work is that now in the Cathedral of Rheims (illustrated in the *Building News* for October 9, 1874). A sparing use of lead was made in ceilings and vaultings, where the gilded stars are of lead. The pomegranate

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pendants and leaves at the intersections of the geometric ceiling to Cardinal Wolsey's cabinet at Hampton Court are of lead, like the enrichments to the ceiling of the Chapel Royal, St. James's. Windows, like those in Salisbury Cathedral, often depended for the decorative effect entirely on the grace and intricacy of their leaded lines. Beautiful plaques of perforated lead, usually lozenge-shaped, but sometimes square or round, replaced one or more of the quarries of a window for ventilation; they are met with in considerable variety in the offices and corridors of Tudor buildings, such as Hampton Court and Haddon.

The simplest and most natural method of using lead decoratively is to cast it in moulds. The Romans first employed a method of decoration used later by Sussex and other mediæval ironfounders. Small objects in relief, such as escallop-shells, beaded rods, plain rings, etc., were impressed as decoration into the beds of sand upon which the sheets were cast. Some richly decorated lead coffins were found under the pavement of the Temple Church.

The author touched on the uses of lead in relation to the plumbers' craft, which was first mastered on a grand scale by the Romans. In England lead pipes have been found in Roman foundations, and at Bath is a massive water channel of lead an inch thick. Water was brought into London houses by lead pipes for the first time in 1582 by Peter Morris, a Dutchman. Leaden spouts for relieving the gutters formed at times a picturesque feature in mediæval buildings. Of greater interest were the conduits or central distributing fountains which generally occupied some accessible place in one of the courts of every princely dwelling. Most of these were under canopies, and lead entered very largely into their construction. The decorated tank or cistern for storing rain-water may be of great antiquity; the earliest preserved of the sixteenth century bearing "E. R." and the royal arms was figured in the *Builder* for 1862 (p. 602). The author referred to several specimens of sixteenth century elaborately-decorated heads to rain-water pipes. In the old artistic days even the pump was made a vehicle for decoration, like that formerly in Leather-Sellers' Yard, which was surmounted by a mermaid pressing her breasts, out of which wine ran on State occasions.

In the seventeenth and eighteenth centuries much of the purely decorative statuary produced in England was of lead, especially the massive equestrian statues, the first of which, that of Charles I., by Hubert Le Sœur, was cast near Covent Garden in 1633 and erected by Charles II. at Charing Cross in 1674. The statue—horse and man—is still the finest we possess. For the garden lead reigns supreme. Softer and greyer in tone, more yielding, less costly, and less pretentious than bronze or marble, lead seems, above all other materials, to lend itself to the garden. An instance was referred to of four or five score of leaden statues dispersed over a gentleman's extensive grounds. They consisted of reproductions from the antique of eighteenth century renderings of gods and goddesses, and of more modern subjects, such as musicians, dancers, mummers, skaters, shepherds and shepherdesses, gardeners, etc., in contemporary costume—the latter group by far the most interesting.

As regards lead architecture, Eusebius speaks of lead roofs in the third century; and the domes of the Holy Sepulchre and St. Sophia are still so covered. The roofing in the seventh century of the Church of York with lead, by Wilfrid, and the sheathing of that of Lindisfarne, by Eadbent, both walls and roof, must have been new and unusual occurrences to have been chronicled by Bede. The development of pointed church architecture in the thirteenth century afforded much scope for a display of leadwork. The roofs rising to a great height, and becoming increasingly rich, with turrets, flèches, crestings, finials, buttresses, parapets, crockets, gargoyles, and, above all, the lofty steeples, often clustered in threes, as at Lincoln, Ripon, and Canterbury, absorbed more lead, and afforded greater areas for display than ever. In France the lead roofs appeared to form almost half, and by no means the least picturesque half, of many of the great sacred buildings. The laying of the lead in strips, vertically or diagonally, formed with their rolled overlaps fretted lines of shadow on the bleached white surfaces. Stowe describes the bell-tower of the Priory Church of St. John as "graven, gilt, and enamelled, to the great beautifying of the city, and passing all other that I have seen."

The Palace of Sheen, rebuilt by Henry VII., seems to have been the earliest revival of great displays of lead in domestic architecture in England, since the roofing with lead of a building earlier in the century had resulted in its being distinguished as Leadenhall. The roof of Richmond Palace was a forest of turrets, octagons, pinnacles, and finials, gold and azure, with the King's arms, and vanes surmounting them. Special ornaments to the building were the turreted lanthorns over the great hall, the clock-case at the west end, the lanthorn leaded and embattled with fourteen turrets over the privy lodgings, a round structure four stories high, called the Canted Tower, embattled and all covered with lead; besides the Chapel, Queen's and Prince's closets, Hall, Middlegate, and kitchen, decorated, embattled, covered with lead, and all equal "special ornaments" of the building. The Palace at Hampton Court, though not completely destroyed like Richmond, is shorn of the lead-covered cupolas, octagons, turrets, and louvres, bedecked with finials and pennons, all glittering in gold and armorial bearings, which rendered it the most attractive sight in all England.

But it was only where timber framing entered largely into the construction that the lead was carried down below the roofs and a truly lead architecture could be revived. The rural retreat of Nonsuch, a veritable palace of lead, dazzled the imagination and baffled description. The stanchions and outposts of the Banqueting Hall, three stories high, and its lanthorn, were "all covered with lead, as were the whole of the wooden battlements, perhaps, like those at Windsor, the great grace and special ornament to the whole building." The upper stories, at least, were "butted round with frames of wood, covered with lead," and these, with the turrets, water-tower, clock-case, etc., "are the chiefe ornament of the whole house of Nonsuch." But for the intrinsic value of its materials, especially the lead, the palace might not have perished.

In 1491, Thomas Wood, a goldsmith and sheriff of London, built a row of shops and dwellings in Cheapside, fronted with lead, which every chronicler speaks of as beauteous and glorious to behold. The front was gilded, and it was known as Goldsmith's-row. Stowe describes it as the most beautiful frame and front of fair houses and shops in London or elsewhere in England. It contained ten dwelling-houses and fourteen shops, all in one frame, uniformly built four stories high, beautified towards the street with the Goldsmiths' arms; and the likeness of Woodmen, in memory of the founder's name, riding on monstrous beasts. All which was cast in lead, richly painted over, and gilt. It was regilt in 1594 by Sir Richard Martin, Lord Mayor, and was destroyed in the Great Fire of 1666.

The author concluded by referring to some modern examples of ornamental lead work, mentioning particularly the bridge across Northumberland-street, connecting the Grand Hotel with its annexe. Some ideas were given for the newly fronting of old houses with ornamental lead-work, and for the treatment of water towers with lead ornament.

The Chairman said they had heard an exceedingly interesting paper, not only from the historical point of view, but from the practical point of view, in the way they might adopt lead to modern requirements.

Mr. R. Phenè Spiers, F.S.A., said he had had a sort of vague suspicion that the Palace of Nonsuch was one of the views Mr. Gardner would put upon the screen, and he would like to hear a little more about it, because in that room they had a paper read by Mr. Robinson many years ago, at which a view of Nonsuch was given, and he claimed that the decorative work of the palace was made in a plaster of a new kind brought over here. He would be quite willing to agree with Mr. Gardner that those panels which decorated that palace would be infinitely better in lead than in plaster, because at the time he wondered how the plaster could have been protected, for in many parts it would not have been protected by those gable roofs found in many of the houses where plaster decoration was employed. Throughout France they had the most beautiful roofs, gable ends, and finials in lead, and in fact they seemed to employ it in decoration to a much greater extent than they did in England. He also remembered seeing at Rouen in the Museum three or four finials which were made in lead. The finials were 6 ft. or 8 ft. high, and massive, and he should think when raised aloft on a gable they would have been very important features. He had also seen lead coffins made by the Romans, and he believed there were two or three of them in the Louvre with precisely the same decoration and method of casting as described by Mr. Gardner. There were three or four in the Louvre brought by M. Ernest Renan from Syria. He had, of course, seen the bridge across the street joining up the Grand Hotel, but did not know that it had ever occurred to him that it was anything else but stone, but it was a very graceful little structure and well decorated, and it was extremely interesting to know that such a feature could be produced in lead. If the result of Mr. Gardner's paper was to induce some architects to employ lead to a greater extent than it had been, and to revive an old manufacture, then Mr. Gardner could not regret the time and labour he had given to the preparation of his paper. He moved a hearty vote of thanks to Mr. Gardner, who had, he knew, devoted many years of thought to the subject, and as to the way the manufacture of lead could be brought into greater prominence. He was sure they were all much obliged to Mr. Gardner for coming there and illustrating his remarks in the admirable way he had.

Mr. Ernest George seconded the motion.

Mr. Maurice B. Adams asked how large Mr. Gardner thought the sheets of cast lead could properly be made supposing they were to erect such buildings as had been suggested? He did not think the suggestion with regard to commercial buildings was at all a bad one, because it was becoming a matter of some difficulty with increasing voids as to how the façade could be adequately treated. In the application of lead, however, the size of the sheets of lead had always been a matter of some difficulty. What was generally done was to nail it up by the top edge, and welt or roll it together, one sheet over the other, and when the sheet was very long fix some sort of iron holdfast to help hold it up, leaving the sheet of metal free of course, for the purpose of expansion and contraction. It occurred to him that it might be useful if Mr. Gardner could tell them whether he had had any experience—possibly he might have had something to do with the bridge at the Grand Hotel—as to how large these sheets should be. Assuming that they were enriched with ornamentation, some parts would be rather heavy, and would require some special fixing, and although they could, as the illustrations had shown, have pilasters to cover the joints of two sheets, one would like to know how large these metal casings could be reasonably made, and which was the best way to fix them. He could not quite follow how that was to be done, and it was a practical question one would like to have answered, as it was probable that others present would have realised the same difficulty. Then Mr. Gardner had not told them how it was that they got the black colour in the lead manufactured of late years. Although silver had gone down in value very much, yet the manufacturers seemed to take out all the silver and arsenic from the lead, so that it did not assume that white and silvery colour which made the old spires of Long Sutton and other places look so charming. The lead thus desilverised had a horrible black colour which appeared to him to be contrary to all artistic sense. He was rather interested to hear that the old statues, which they so much admired for their silvery colour, were originally picked out in colour and painted over, and he could not help feeling that they must look much better as they were now. It would be difficult to imagine anything more incongruous than old statues thus dressed out with barbaric splendour. He would like to know whether we could get instead of the ordinary lead of commerce pure lead with the silver left in it; whether there was any manufactory where lead in its genuine form could be purchased, and whether it was much dearer than the ordinary lead? As to the artistic treatment of lead, that must vary with people's taste, but he felt they should try to get out of the mechanical way in which they applied all materials. If they looked at the old spires and the old roofings, they would see how irregularly they were spaced, and, instead of having a ridge to give a uniform line, the rolls were carried out right up to the ridge and allowed to break the ridge line. He was aware that the wind pressure was a very great difficulty with these sheets of lead, and he understood that Lord Grimthorpe got rather into a difficulty with lead with regard to St.

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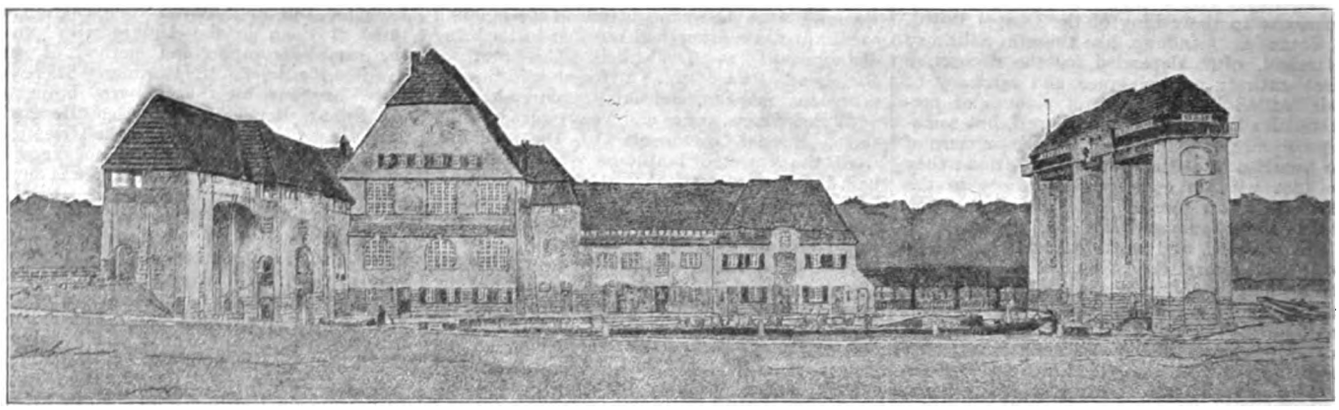

Lock Buildings, Machnower, Charlottenburg. Herr F. Lahrs, Architect.

(*From the* "Berliner-Architekturwelt").

Albans Abbey because of the creeping of the lead, and, as a matter of fact, it all had to be done over again. It must have been a very great difficulty when the old builders built those immense spires like the one over St. Paul's Cathedral which was burned down long before the Great Fire, which went up, he believed, 520 ft. above the ground, and was covered entirely with lead. The wind pressure on these old spires must have been something tremendous, and the way in which the lead was fixed down was a matter of extreme interest.

Mr. W. H. Seth-Smith said they had listened with much pleasure to such an eminent authority on the subject of metal work, and it was extremely interesting to have his experience and his taste to guide them, and they hoped the suggestions Mr. Gardner had made might be made use of by at least their younger architects. As to what Mr. Adams had said as to the colour of lead, he had noticed it himself, and he sympathised with Mr. Adams thoroughly. The result of a lead-covered facia was most unsatisfactory, owing to the way in which the lead appeared to be prepared now. He was lately in Frankfort, and was noticing in old buildings there what the effect of the lead lacework on the gables was. Nothing could be more beautiful than the fine line given by that lead work, with all its rich details. He also passed a building in London the other day—he believed it was a Sailors' Institute in the East India Dock-road, or just by there—in which lead appeared to have been freely made use of, and it was very charming indeed. It was introduced in panels in front over the main entrance. There were other points which Mr. Gardner did not mention, but which he undoubtedly had in his mind—that was the great use made of lead in sundials and in the balustrades of the staircases, which were so very charming in London, and which they would have liked to have had some views of.

Mr. E. W. Hudson said that if they used lead for a fountain in a public place they would run the risk of losing the decorated part by the juveniles, if not by thieves, and therefore the application of lead to a high building like a water tower would be of particular interest. He was interested to hear Mr. Gardner bring in the instance of the Tower of St. John's Priory, Clerkenwell. He had often wondered what Stowe's description actually referred to when he spoke of the "graven, gilt, and enamelled panel." He did not know whether there was any authority for actually claiming it in metal, but it would be interesting to know whether or not it was so. They all remembered the application of lead to statuary, and would remember the negro boy which used to stand in St. Clement's-inn. He did not know whether it was there now. They also knew in the Middle Ages lead was considerably used for images and saints, and so on.

The Chairman said he was sure that some of the illustrations must have made them regret very much that they had not now in London anything so charming and picturesque as the view they had been given of Goldsmith's-row, Cheapside. With regard to what Mr. Adams said as to the colour of lead, he thought there was no possible doubt that the lead they got now and what they used for their roofs was a very different material from that used 200 years ago. As to Mr. Gardner's remarks on putting up erections of perishable material and covering them with imperishable material such as lead, he was not quite sure whether the effect of that covering would be quite so permanent as some people would think, because it had been his experience, sometimes, in treating old houses where there had been a timber turret which had been covered with lead that the lead had cracked in several places and had not been looked after, and this had let the water in, which caused the timber behind to rot in the most terrible manner. The treatment which Mr. Gardner alluded to of covering concrete and metal material with lead, undoubtedly would prevent that, and seemed to be quite a feasible method. As to what Mr. Adams said as to the size of the sheets, it appeared to him that in any treatment of lead for surface decoration they must keep the panels rather small. They had all known for a long time that Mr. Gardner was one of their best artists in iron work, and it was apparent that he had not restricted his researches to that material.

Mr. Gardner, having replied to the vote of thanks, said that, with regard to the remarks of Mr. Spiers, he spent almost two days in looking over the accounts of the buildings of Nonsuch, and he thought the plaster used there was plaster of Paris, which had nothing to do with any external work; and he did not think from what he had read that any kind of plaster was known at the time which would have been available for it. Although there was some doubt about the meaning of the description, he did not think by the light of the earlier building in Goldsmith's-row there could be any doubt that the whole of the decorative work of Nonsuch was cast lead work. The account as good as stated that all the decoration of the tower and spires was lead. He had not had very large experience in lead construction, and the largest work he had had to do was the lead bridge at the Grand Hotel; there the panels were cast in sand in an open mould, and, so far as he could recollect, the size of the panels was 4 ft. by 3 ft. But there was no difficulty whatever in casting lead if they had enough hot metal and enough cauldrons to pour from. He would make a panel of 10 ft., but he would not recommend cast panels of that large size, because they would be unwieldly. Otherwise he did not think there would be any difficulty about it. There was no better way of fixing lead than by screws to iron, but of course they must be careful to give an amount of play, or otherwise it was extremely probable that with a change of temperature there would be buckling. [The Chairman: What thickness would the panels be?] They could cast a quarter of an inch thick, but where there was a good deal of ornamentation it would be thicker. [Mr. E. George: May the lead be safely put to iron?] There was no action between the metals unless there was water between them. Dry junction had no effect whatever. There was no galvanic effect going on except with water, and then only when the metals were sometimes wet and sometimes dry. The oxide was a very curious thing—that white colour which came to old lead. He could not consider that it was due to the silver because silver oxide was black, and he did not think the presence of silver could possibly affect the oxidisation of lead. Very possibly arsenic might. That was a matter he had not thought over, but he thought it would not be beyond the bounds of science to start that white oxide if necessary by the application of an oxidising agent. He should think that possibly a chemist would suggest a means of starting it just as he would start the green oxide on copper. He quite agreed that it was a great drawback to lead that it had assumed this black colour, but he expected that it would pass off with age, and become that white which they admired. The drawback to the actual joining of the joints of lead was the change of temperature. They must give it the means of contracting and expanding, and that could be done only by some kind of loose joint that was rolled over and was water-tight. The moment they burned the joints together they were bound to have buckling and trouble. He would always advocate either strips of lead to cover the joints or lapping edges one over the other in a way which would permit of movement. In reply to Mr. Hudson he would not suggest having a lead fountain, which could be kicked by children. One would always have a stone basement or something in front to hold the water, and the lead work would be behind the water, where it could not be tampered with or injured. Stowe—unless he misread him—particularly stated that the Tower of St. John's was of lead. Of course it was not really enamelled, but it had the effect of enamel; it had been painted or coloured in some way. There was no doubt the French in many cases tried to produce the effect of enamelled work on their leaden roofs. The negro which used to be in St. Clement's-inn was now in the Temple Gardens. It was one of the stock models, and there were many replicas dotted about the country. At the same time it was one of the most beautiful models.

The Chairman announced that the next meeting would be held on Monday, February 1, when the President will deliver an address to students, and some critical remarks will be submitted on the drawings sent in for this year's prizes, and at the conclusion the prizes will be presented by the President. At the same meeting an announcement will be made of the Council's nominee for the Royal Gold Medal.

DESIGN FOR CANAL LOCK BUILDINGS, MACHNOWER.

UNDER the heading "Magazines and Reviews," in our issue of January 9, we alluded to the interesting competition designs for new lock buildings on the canal at Machnower, Charlottenburg, described and illustrated in the last issue of the *Berliner-Architekturwelt*. The accompanying illustration is a slightly reduced reproduction of the perspective view of the first premiated design, by Herr F. Lahrs, of Charlottenburg, given as a chromo-lithograph in the *Architekturwelt*.

BOOKS RECEIVED.

GAUDENZIO FERRARI. By Ethel Halsey. (Geo. Bell and Sons.)

GREAT MASTERS: REPRODUCTIONS IN PHOTOGRAVURE. Part VII. (W. Heinemann.)

BRICKWORK AND MASONRY. By Charles F. Mitchell and G. A. Mitchell. (B. T. Batsford. 5s.

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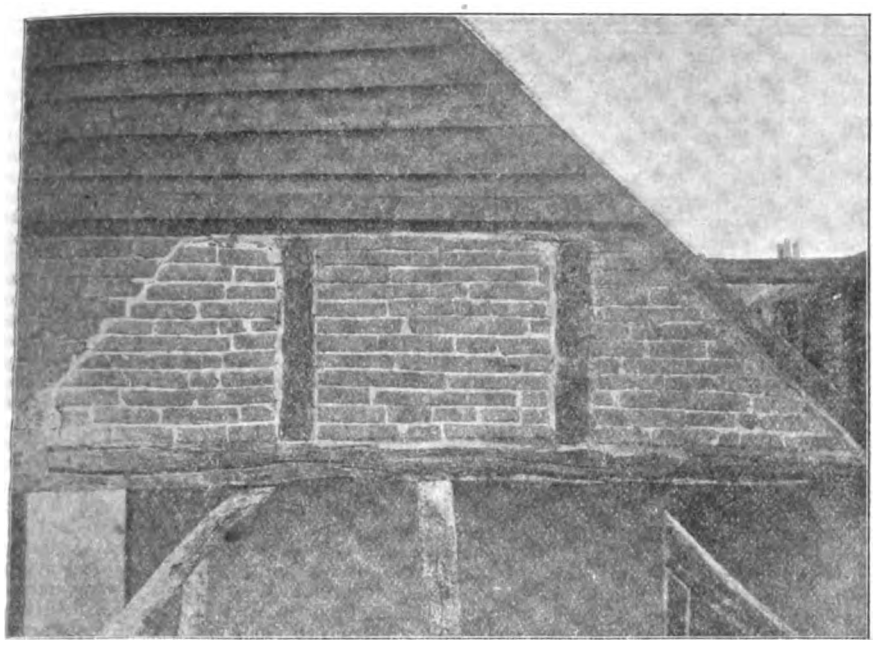

Part of Gable at Cobham, showing proportions of bricks.

A CURIOUS OLD COTTAGE GABLE.

THE annexed illustrations of an old cottage gable in Surrey have been kindly sent to us by Mr. A. Gower, builder, of Cobham, Surrey. The remarkable point in regard to the work is the length of the bricks, as will be seen from the larger illustration, which shows the work more in detail. Mr. Gower writes: "This unique brick gable, of which I inclose illustrations, has just been found in some old cottages that I am pulling down in Cobham. The long bricks are 21 in. by 5 in. by 2 in., and the others are cropped pieces of the same. I am removing it bodily, and it will be on exhibition in my yard. The bricks are very hard and heavy. I can give no explanation of why they were made thus, and I thought it might be of interest to you and your readers.

"I have only found two other pieces of these bricks, one 18 in. and one 12 in. long. As this portion of the gable is complete, it leads me to think the whole framing may have been filled in with them. The left-hand 4 ft. is evidently an extension at a later date, as it is a straight joint right up from the ground at the point marked with a cross."

Old Cottage Gable at Cobham, Surrey.

COUNTRY HOUSES.*

(Continued from page 55 last week.)

COUNTRY house planning presents many interesting problems, some very difficult to deal with—water supply and drainage perhaps two of the most awkward. On small sites adjoining towns, or in the suburbs, the question does not arise, as here the water is generally laid on from mains, and there is a system of drainage, but away in the country these two facts force themselves very much to the fore. Generally on most sites there are springs of water—these may be only shallow, and supplied by surface or rain water—which are intermittent, and fail periodically about October to December, the time when most water is wanted in country houses.

Sometimes we are fortunate enough to find a deep-water spring running continuously all the year round—if above our house on high ground we have a practically constant supply, and, by collecting a head of water at the spring, in a reservoir of some 5,000 or 10,000 gallons, a stand-by in case of fire. When this is the case it is a good plan to lay a 2½ in. iron main direct to the house, rising with a union and fire-hose on each floor and delivering over the cisterns in the roof with a ball valve.

By this means the full pressure of 5,000 or 10,000 gallons can be brought to bear in a minute or two to put out any outbreak, for it is only at the first onset that a fire can be dealt with, and if once it gets beyond this in a country house it is generally serious. Keep the hose permanently attached, with nozzle, etc., complete, so that the water can be turned on instantly; to merely hang it in a neat coil at the side is useless, and valuable time is lost in trying to connect it to the main.

If our spring of water is below the house, and the fall sufficient, then a ram can be used, or an oil or hot-air engine, or a motor from the electric lighting plant, if there is one, and we are on flat ground. If there are no springs we are thrown back upon wells, and these again are of two kinds—surface and deep-water wells. The latter, of course, are preferable, as they are generally constant, of good quality, and need only a lift pump to force the water to the cisterns in the roof. There is a prejudice against surface water wells, and in many cases rightly so. In small towns and villages, where the soil is porous, and where there is no system of drainage and the whole ground is saturated with impurities, they are undoubtedly dangerous to health; but where no other supply is possible, and there is no chance of any contamination, there is no objection to their use. Surface wells are those fed by rain water, pumped by an ordinary pump, and if the top 12 ft. or 14 ft., or even less, is lined with brick-work in cement to keep out any impurities from soaking in, without being filtered by passing through the ground around, then these wells are quite safe. Of course they should be near no soil or other drains, and, if possible, above them, so that there is no chance of any contamination by gravitation.

Surface wells have the same objection as shallow springs, in that they fail in dry seasons, so that where this is likely the rain water should be stored. Rain water is so useful in every way, for garden and stables, as well as the house, that it should be collected and filtered. Where the water is at all hard, or likely to choke and fur the pipes, rain water is a most valuable asset, and if a supplementary tank in the roof is arranged to supply the hot water circulation, and draw off, say, in the housemaid's closet, for use in the bedrooms, it will be found of the greatest service.

There are various water softeners on the market, but none to my mind satisfactory for working a small house. None are automatic in their action, and all depend upon constant attendance and supervision, neglect of which puts them out of order. This, however, is a matter that has to be treated specially, but it is a question that continually arises in the country.

At the outset the water should always be analysed, so that provision can be made for any possible storage or filtering tanks.

Drainage generally cannot be treated too simply, and though this is not the place to deal in detail with such matters, yet there are a few points to be emphasised. As much as possible the rain water should be kept separate from the soil drains. If in one and the same system, apart from wasting the rain water, we have, especially in seasons like the past two years, such an enormous quantity of foul overflow water to deal with, that it becomes a most serious difficulty. The ordinary overflow from a cesspool can generally be dealt with, but when this becomes diluted with a large quantity of rain water it is a different matter, besides rendering the contents of the cesspool useless for gardening or other purposes.

Genuine old English cottages and houses invariably add a charm and beauty to the landscape, as the old builders, by force of circumstances, were compelled to use the local materials, and what is native to the neighbourhood fits in most appropriately with the scenery.

The very simplicity of the builders of the seventeenth and eighteenth centuries saved them from flagrant mistakes. They made direct for comfort and convenience without troubling overmuch about ornament, and where these are there can be little real ugliness. Their work was the result of evolution, growing out of the wants which the builders had to satisfy, and of the natural material at their command. I think sufficient stress cannot be laid upon the fact that it was the being compelled to use only the materials to hand that made old work so restful, and that modern building suffers through our not being sufficiently self-reliant in the use of the materials of the districts we are building in. It is the present-day taste for cheap ornamentation and pretentiousness, and the importation of strange features that spoils so many houses, the bringing of the jarring notes of town life into the peace and simplicity of the country. There are very few country districts in England that do not contain even to-day much excellent local material, either stone or brick, chalk or flint, and if, before deciding the materials of our house, a careful search were made and inquiries instituted about them, one's work would not only be better, but much more appropriate to its surroundings.

There is no need, because a railway line will bring bricks and the slates within a mile or two of your new house, to use those materials. As architects, we should try to foster and encourage all local industries and trades, for it is better to build with the same materials that have been used for centuries than with those out of harmony with the district. Years ago, and to some extent even to-day, one could tell by glancing at the buildings not only what were the local materials, but almost in what part of England you were in. Each district was stamped with its special characteristics, not of style and date, but of material. The admirable way which the Kent and Surrey builders used the tiles for roofs and wall hanging always excites our admiration; in Norfolk, where we get brick and flint buildings with pantile roofs, the latter interspersed with diapers and patterns of glazed tiles; in Berkshire and the brick districts of the Thames valley

* A paper read before the Liverpool Architectural Society, on January 4, by Mr. E. Guy Dawber, F.R.I.B.A.

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how characteristic are the simple yet dignified houses with the red walls and white windows; then the stone districts of Gloucestershire and the Midlands, the timber buildings of Cheshire and Lancashire, all speak eloquently in their own particular vernacular a language not to be mistaken or confused with the work of any other part of the country. To-day all this delightful tradition seems to be abandoned, and we use all sorts of materials, regardless of their appropriateness, in every part of the country—green Westmorland slates in Kent, red tile hanging in the heart of stone districts, and stone houses in the centre of brick ones. Consequently, like everything else, there is a spirit of unrestfulness pervading much of the country house architecture, and it does not seem to fit its surroundings, and looks uncomfortable and out of place.

Many will say this is altogether an absurd view to take—to limit the materials of a building to those obtainable in the vicinity, but I feel that, in face of the fact that such beautiful work has been done in the past with these same materials, there is no sound reason, except that of mere novelty, for the introduction of foreign ones, and to break entirely with the traditional use of the local materials seems quite unnecessary. I do not, of course, mean that we should copy and reproduce the local styles of architecture, for that is merely an archæological forgery—but we should design our new buildings in as modern a spirit as we wish, but using the materials at our command, the very fact that in so doing we shall be more or less governed by the same conditions and limitations as the old builders will give our work to-day a certain continuity of design and feeling in harmony with the old.

Before commencing to build in a new district, it is always advisable as well to study the old methods of building in the neighbourhood and to learn all you can from local builders and workmen. Much valuable knowledge will be obtained in this way, for it is surprising what shrewd and practical men some of these old country builders are, and what useful lessons in construction and the proper use of local material can be gained from them.

Architects, as a rule, do not sufficiently study the materials they are working in, and forget that details and mouldings that look well in one material do not do so in another. In the treatment of the exterior of a country house material has a great deal to do with the general effect, and if this is not studied properly, however well the house may be grouped and balanced, the final result will be disappointing. It is out of place to get a variety of materials in one house, such as brick and tile hanging, half timber work, rough cast and stone, as we should remember that in the country the texture and colour of the walls plays a far more important part than a number of features in different materials. It is the introduction of so many and various styles that makes many country houses to-day so unrestful and out of place. They should not be treated externally with nearly so much minutiæ of detail as houses in town, where narrow frontages compel us to concentrate our detail and form, so as to attract attention. In the country a breadth of treatment is absolutely essential to the repose and dignity of the whole composition, and this can never be obtained if the wall surface is broken up with ornament and unnecessary detail.

If we analyse the reason why so many old houses are so pleasing in appearance, I think you will find that it is because the builders have more or less confined themselves to the use of one material, and that this has been treated in a simple and rational way, and the detail generally kept as quiet as possible. It is the introduction of "features" that spoil the effect of many modern houses. Architects, indeed, seem afraid to leave any plain piece of wall surface without doing something to it, forgetting that in a few years time it may probably be covered by ivy or other creepers. In the country we should remember that the house continually occupies attention, and that any extravagance in detail or odd and unusual features are apt to tire and offend the eye, and therefore it is much better to keep the exterior as reposeful and inoffensive as possible, and depend for the effect almost entirely upon the proportion and grouping of the building. Of course, I do not for one moment decry beautiful detail or well-designed ornament, but it should be used sparingly, and only where its full value will be appreciated. The garden plays such an important part that it is unnecessary to spend money on the embellishment of the exterior of the house. Material, again, and its capabilities and limitations, should govern our design to a very great extent. A roof, for instance, that can be laid at a tolerably flat pitch in blue slates would be out of place in tiles.

As a rule, you should avoid too flat a pitch, which generally gives a bad proportion to a building, and is not so suitable in a country like ours, where we get much rain, sleet, and snow, that should be got rid of as quickly as possible, and with the least chance of finding its way into the house. A steep roof gives a sense of warmth and shelter that is never obtainable in a flat one. We are often pleased with the appearance of a building without knowing or troubling to inquire why; but if we come to examine the reason for our feelings I think you will invariably discover that the pitch and arrangement of the roof has most to do with it, in addition to a generous overhanging eaves. Half the charm of the old-fashioned cottages and houses, both here in England and abroad, consists in the liberal projection of eaves (a feature that is never considered by the jerry-builder). In wide overhanging eaves there is a suggestion of protection and comfort which is most pleasing. From an artist's point of view, think what a difference the shade cast by the eaves of the house on to the wall beneath makes to its beauty, emphasising and yet softening the transition from wall to room with a line of cool, grey shadow. Many houses are spoilt by consideration not being given to minor details of this kind, which just make the difference between good and bad quality of work.

In the treatment of roofs generally I think we have very much to learn from our Continental neighbours, where roofs, as a rule, are far more studied and much more marked than in this country. We treat our roofs far too severely and mechanically, and our modern methods of forming hips and valleys are absolutely destructive of any continuity of surface or texture. In the beautiful stone slate roofs of Gloucestershire and the blue slate ones of Holland and France the valleys are worked round in a wide sweep, enabling one roof to intersect another in a most charming fashion, and without any hard line of demarcation. Our modern method is to put a rigid gutter of lead, which cuts the roof up into varying planes, and destroys the feeling of one single covering that a roof should always produce. Hips again, instead of being marked by a strong and well-defined line, generally are made of tiles, kept as insignificant as possible. Abroad it is the invariable custom to point the ridge and hip tiles with a wide joint in white mortar, which emphasises the outline of the roof and acts as a contrast to its colour; and if the roof is hipped all round, the short sides are always made with a steeper pitch than the others, which prevents the roof looking flat when seen from the angle.

The chimneys have much to do with the appearance of the house, and they deserve far more attention than is generally given to them. For economy's sake they should be as few as possible, and their position well-balanced and evenly distributed over the house. Nothing so spoils the composition as a lot of small and thin chimneys coming out of the roof at unexpected places.

A well-designed chimney stack is not only useful constructionally, but if arranged at the end of a house, as you know, it gives great character and charm, and deserves much time and attention being spent on it. If building in brick, try and plan your fireplaces and flues so that the chimney stacks are solid and square; anything is better than a long flat chimney of some ten or a dozen flues and only 18 in. wide! Its effect is always poverty-stricken, and the additional brickwork in the chimneys makes them stronger and warmer, and consequently able to draw better. If building your stacks with diagonal flues never have any of the faces less than 1 ft. 10½ in.—18 in. is much too thin—and the stronger and squarer they are, the better they will look. Tall and massive chimneys, whether in brick or stone, add immensely to the beauty of a house, and perhaps no architect has realised this so thoroughly as Mr. Norman Shaw, whom I regard as a master in the art of grouping and arranging his chimneys.

The fine breadth of feeling and proportion that the old builders always attained in their chimneys is a feature much neglected in modern work.

Windows should all be of the same character, and, though it is often done, you cannot or ought not to have in the same elevation sash windows and casements, at least not in positions which bear the same relative proportion to each other Sash windows, as a rule, demand a more severe handling than casements, and where they are used a certain sense of rhythm and symmetry is essential. The fact that the proportions are vertical instead of horizontal makes them more difficult to deal with, so that a more formal design and arrangement, both in plan and elevation, should be adopted. Nothing is more unsatisfactory than sash windows of varying heights and widths scattered about the elevations, for all dignity and simplicity is lost, unless they are proportionate one to the other, and spaced more or less equi-distant apart.

There are many advantages in the sash window, its method of opening for ventilation being one, and the texture its bars and small panes give to the general surface of a building being another. Casements, of course, can be more elastically treated; indeed, they are the easiest form of window to deal with, and allow of infinite variety—in bays, oriels, or plain windows, and in either wood or stone; pulled out to a long and low window, or coupled together, and by means of transomes carried up to any height. Personally, in a country house, if lead glazing is adopted, I am averse to any coloured or painted glass, or to fanciful patterns in the leading. Here there is nothing to hide or screen, as in towns, and simple squares of clear glass, which do not shut out the green fields and trees, or clouds and blue sky, seem all that is necessary. In certain windows—perhaps in the hall or staircase—it may be desirable to have coats-of-arms or something of that sort; but let it be a feature distinct by itself, standing out conspicuously from its environment of clear glass, and not in any sense mean as a screen. Upon the balance and proportion of the windows in a house much of the beauty of its elevations depends. As a rule nowadays, windows—casements especially—are made too big and too wide, and consequently out of scale and proportion. This is due in a certain measure to the foolish building by-laws made years ago for buildings in crowded cities and towns, and which are totally inapplicable for country districts. In the country, where a far greater proportion of time is spent out of doors than in towns, the necessity for large windows is not so great, for every architect knows it is not so much the size as the position of a window that best lights a room.

Large windows, if facing north and east, make a room cold, and if facing south and west too hot.

And, bearing on this fact, it is curious that although in old houses the rooms may not by measure be larger than those of an ordinary modern house, yet they often appear more roomy, and can contain more furniture with comfort. The cause of this lies in good proportion, the rooms not being mere cubical square boxes, but wide apartments, the plans themselves being good, rooms well and effectively lit, without too much or too little window, and more particularly the various windows, fireplaces, and doors being well placed with regard to one another; it is on the attention to these points that the comfort of a house depends. If you examine and measure the windows of any thoroughly well-lighted room in an old house, you will be surprised to find how small the actual openings are and how unnecessarily big we make ours. In a measure this is perhaps attributable to the height modern rooms are made. The reaction from the low and oftentimes dark rooms of the sixteenth and seventeenth centuries set in in Queen Anne's reign to the high and lofty ones then coming into fashion. This feeling has lasted to the present day, and has done more to spoil the proportions of modern houses, both inside and out, than almost anything else. High rooms are always associated in people's minds with healthy rooms, and though this is doubtless true if the windows are taken well up to the ceiling, yet in very many cases this is not done, and there is a pocket of bad and vitiated air that cannot escape, and which produces a sense of oppression and weariness never met with in a well-ventilated room that may be much lower. Rooms above a certain height become disproportionate as regards their width and length, and unless the windows are carried close up to the ceiling, they cannot be well ventilated.

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As I mentioned before, it is a great addition to a house to get one room higher than the others; the hall perhaps carried up two stories or the parlour treated as a music-room, with panelled ceiling and sides. To speak of the inside decoration or the fitments of a house in a paper of this sort is quite impossible; it is a subject in itself, and one that would occupy an evening to deal with.

Generally, the keynote to the treatment of the inside of a country house is contained in those two very hackneyed words "breadth and simplicity." Simplicity does not in any way mean "poverty" of treatment, but restraint and a certain amount of common-sense in design. A house can be fitted up with the richest and most exquisite materials, and yet be absolutely "quiet and dignified." Also it can be treated with the poorest materials, but in a manner that produces an overwhelming sense of garishness and vulgarity. Think of the arrangement often seen in an ordinary room in the country. An enormous cornice of heavy and cumbrous shape fills up the angle of the room, a large moulded picture rail, and a deep-moulded skirting of coarse and vulgar detail, entirely mar all sense of repose and scale. The skirting, for example, is put to prevent the legs of chairs and pieces of furniture, or brushes, etc., from damaging the plaster of the walls. It need be little more than a fillet some 3 in. or 4 in. high at the most, kept as plain and unobtrusive as possible, and in no sense as a decorative object. Yet tradition has handed it on as one of the essential features in a room, and to-day it is continually met with 15 in. and more in height, showing that its original object is not only absolutely forgotten, but quite misunderstood. The masses of woodwork, in the way of linings and architraves, so constantly seen around windows, again, are surely entirely out of place in the country, and, instead, if we have the plaster work taken into the window frames, without any woodwork at all, the effect is greatly enhanced.

Ornamental plaster work is a delightful method of treating walls and ceilings, and one that particularly lends itself to the decoration of country houses. If, however, it is used, it should be taken, as far as possible, throughout the whole house, even if only a touch here and there is put in some of the rooms, for the effect, however slight of a continuity of treatment, will be better than concentrating all the decoration in one elaborate room. And this indeed applies to everything in a country house—just as there should be no "back" to it—so there should be no part or room out of character with the rest. There should be a similarity of treatment throughout; one room should lead to another without any violent contrast in colour or detail, and the whole should be thought out, planned, and fitted as one scheme.

We should endeavour to plan our houses with an absence of everything that goes to make work and labour, to concentrate the various departments, and to make their working as easy as possible, and though my few remarks apply more to the houses that are generally built, and which come in our everyday work, yet what I have said is equally suitable to the costly and elaborate ones. The simpler and quieter they are kept, both inside and out, the more successful they will be, and though there is a great prejudice amongst people against any changes in our methods of living, yet I feel the force of circumstances and progress of public opinion, in the country, at any rate, is bound in time to have its effect.

Of course, in comparing old houses with modern ones, as so many people do—to the disadvantage of the latter—the fact is always overlooked that the builders of them had none of the difficulties to contend with that are ever present to-day. Drainage and sanitation were practically unknown in the way we now understand it; water supply and the consequent introduction of hot and cold pipes inside the house; electricity and heating, together with the complication of modern requirements, and the over-elaboration of planning and arrangement were all non-existent, so that when these old houses are examined in detail they are found to be both simple in plan and elevation. All these houses, too, were built, the smaller ones, at any rate, by local men, and with local materials, and there was no visible change from the houses built by fathers and their sons. Building was traditional, and any changes were the result of gradual evolution as the work went on. Houses in the same districts were always alike, and the transition in style to other places where the materials were different was gradual and not harshly marked.

All this is changed to-day, and new houses are built, often closely contiguous, of different materials, and in widely varying styles, producing a violent contrast of effect and a jarring note in the landscape, and, to my way of thinking, for no particular reason. Building nowadays is different, as there is no traditional style, and the public help themselves at will from the varied fare provided by architectural caterers, and, as a natural consequence, suffer from architectural indigestion. It rests with architects to remedy this condition of affairs, and to show in our work that it is possible to build country houses which will combine the simple beauty of bygone times with a thoroughly practical solution of the many requirements of our own day, and this I feel sure that most conscientious architects are trying their best to accomplish.

Fragments of Ancient Work found at Bermondsey.

REMAINS OF BERMONDSEY ABBEY.

A VERY interesting discovery has just taken place upon the site of the new artisans' dwellings now being erected by Messrs. James Smith and Son for the South-Eastern Railway Company, under the direction of Messrs. Humphreys, Davies, and Co., architects, at the corner of Abbey-street and Tower Bridge-road, Bermondsey. During the excavation for the basement to the third block, coming away from the church gates, upon which site formerly stood the Curriers' Arms publichouse, the workmen came across two limestone coffins containing human remains. Great care was taken so as not to disturb anything that might be a historical feature, and the soil was removed without damage to the skeletons or coffins, and we were able to take photographs. One skeleton was that of an aged man with head lying on one side, probably deformed, as he had curvature of the spine. The other was at first thought to be that of a woman by the shape of the pelvis, but after examination by Dr. Fox and Dr. Smart it was decided that it was undoubtedly that of a younger man. The coffins were found about 10 ft. deep below the ground level, and were placed upon the gravel bed. They had no lids, and were filled up with sand, which had evidently helped to preserve the bodies. A third coffin was found about 8 ft. away, but was demolished by the workmen before investigation. The bodies were evidently those of persons of high rank connected with the ancient Bermondsey Abbey. Most probably they were abbots, as other remains were found in the vicinity, but without coffins, and which evidently were ordinary monks. Records show the site to be that of the burial-ground connected with the abbey, the only portion of which remaining is the portion of the East Gate House, situated in Grange Walk. It was originally a Cluniac monastery, founded in the eleventh century; the first prior, Peter Osbern, was appointed in 1089; he died June 10, 1119. In 1390 it was made an abbey, and John Attelborgh was created first abbot by Pope Boniface IX. The last abbot was Robert Wharton, who surrendered the abbey to King Henry VIII., who dismantled it on January 1, 1537, for which Wharton obtained a pension of 333*l.* 6s. 8d., and in addition the Bishopric of St. Asaph. The first rector was John de Ecclesia. Since then there have been fifty-seven; the present one is the Rev. Henry Lewis.

There have been found also on the site during the excavations a number of moulded stones of different periods connected with the abbey (some of which are shown in the accompanying photograph), and also the principal foundations.

They have been traced and placed on record by the London County Council.

JOHN VAUSE,
Clerk of Works.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—Professor Beresford Pite addressed a meeting of the Manchester Society of Architects on the 14th inst. on the subject of the registration of architects. Mr. Charles Heathcote was in the chair. Professor Pite discussed the Architects' Registration Bill, promoted in the last session of Parliament and dropped, as indicating the programme proposed for registration. The bill would operate by examination. It was, however, only the scientific part of an architect's professional education which could be tested by examination, and this he held in common with others engaged in building—with engineers or builders—and any partial legislation applying only to architects and excluding other builders would be impolitic. The artistic qualifications of the architect were discussed at length, and it was pointed out that these are quite indefinite and incapable of test by examination. His peculiar qualification is that he designs, and this special quality, Professor Pite held, is that which cannot be tested by examination. Therefore a bill to establish a qualification of architects by examination must fail in effecting its purpose.

BRISTOL SOCIETY OF ARCHITECTS. — The ordinary monthly meeting of this Society was held at the Fine Arts Academy, Clifton, on Monday, the 11th inst., Mr. Joseph Wood, President, in the chair. After the routine business, including the election of three new members, a paper was read by Mr. Harrison Townsend on "Pictorial Mosaics." The lecture started with a description of the earliest examples of Christian mosaic handed down to us from the 4th century. The basilicas erected by Constantine were extensively decorated with mosaic, and those in the Church of Sta. Costanza at Rome were particularly interesting, showing, as they did, distinct pagan influence. The fragment of mosaic, apparently of this century,

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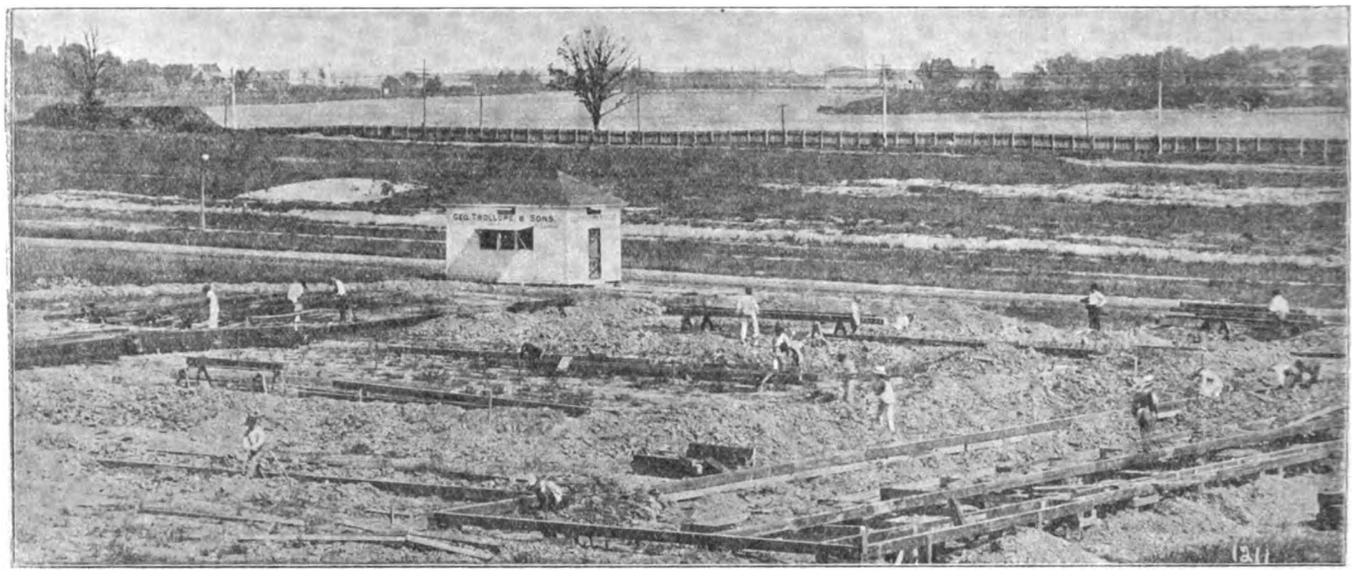
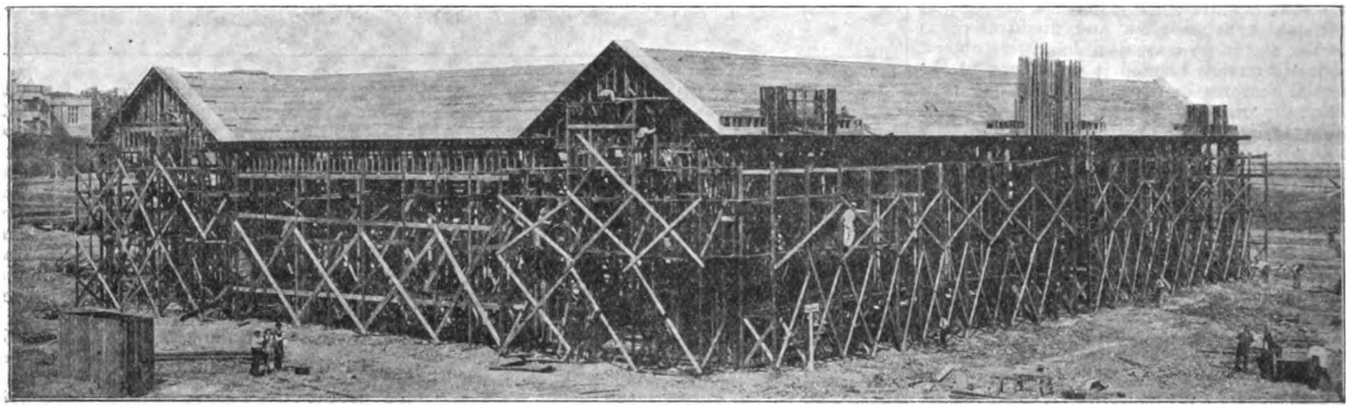
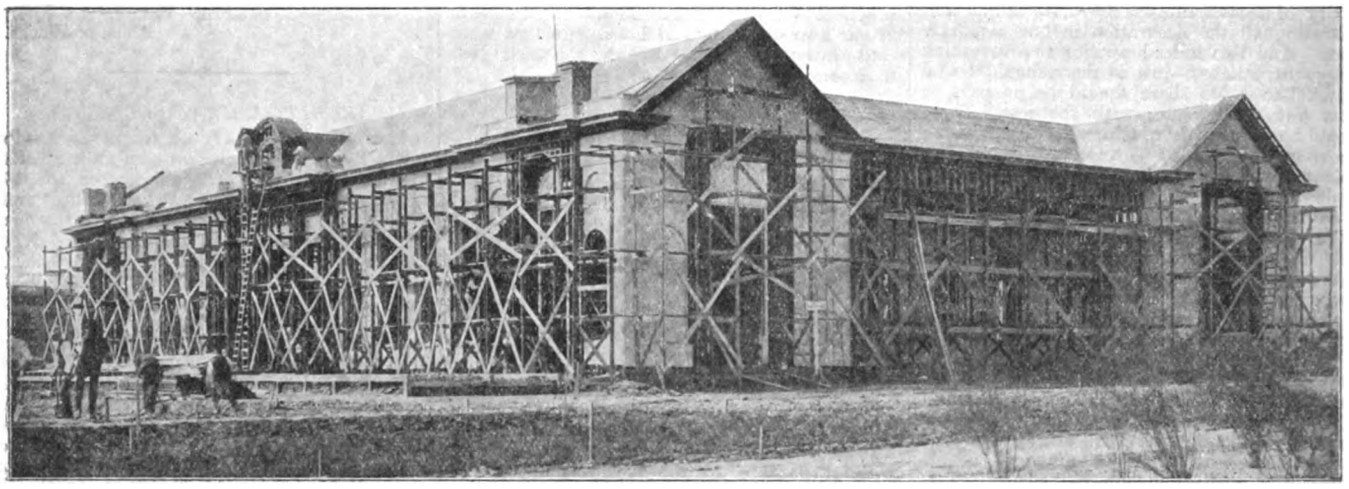


Aspect of Site on August 22, 1903.



October 2, 1903.



October 15, 1903.

A Rapid Piece of Work:—Illustrations of the Progress of the English Pavilion at the St. Louis Exhibition.

found in the cemetery of S. Callisto at Rome, and now in the Vatican, was interesting as being the earliest representation of the traditional face of Christ. It was in the early years of the 5th century, A.D. 402, that Honorius shifted the seat of Empire to the bare marshlands of Ravenna. Ravenna owed to the Empress Galla, of Placadia, the widow of Constantine II., three of its treasures, the Baptistry of the Orthodox, the Chapel of the Archbishop, and the mausoleum of the Empress herself. The central panel of the act of baptism in the baptistry showed that pagan symbols and tradition still lingered, the figure representing the River Jordan as a typical Roman river god holding the traditional urn whence gushes forth the stream. At Rome highly important work was executed in this century; the mosaics on the Triumphal Arch of Sta. Maria Maggiore showed the Annunciation, the Presentation, the Three Magi, the Dispute in the Temple, and the Massacre of the Innocents. Much of the mosaic work of the basilica of St. Paolo fuori le Mura was interesting in so far as it retained for us the scheme of the original mosaics of Pope Leo I. (440 to 461). The 6th century was rich in material for study in both the eastern and western portions of the Empire. In the former the building of Sta. Sophia at Constantinople, after the fire of 533, was brought to a close by Justinian in 559; the gorgeous mosaics with which this beautiful edifice was decorated had lain, for the many centuries that followed the dominance of the Crescent over the Cross, under many concealing coats of whitewash. In 551 Ravenna resumed its place as a great city of the Empire of the East, and early in the century the Baptistry of the Arians, or Sta. Maria in Cosmedin, was built. The mosaic decoration of this church, like its rival the Baptistry of the Orthodox, or St. Giovannia in Porte, started with the central subject setting forth the Baptism of Christ, a curiously close copy of the earlier example seen in the latter church. St. Apollinare Nuovo and St. Vitale were churches which both contained fine examples, and for all its sadness of decay St. Pollinare in Classe was a magnificent contribution to the history of mosaic art. Leaving Ravenna for Rome they found the art under fresh influence, due to the dominance of the northern races after the accession of Theodoric in 493, a good instance being the Church of SS. Cosma e Damiano. Further works in

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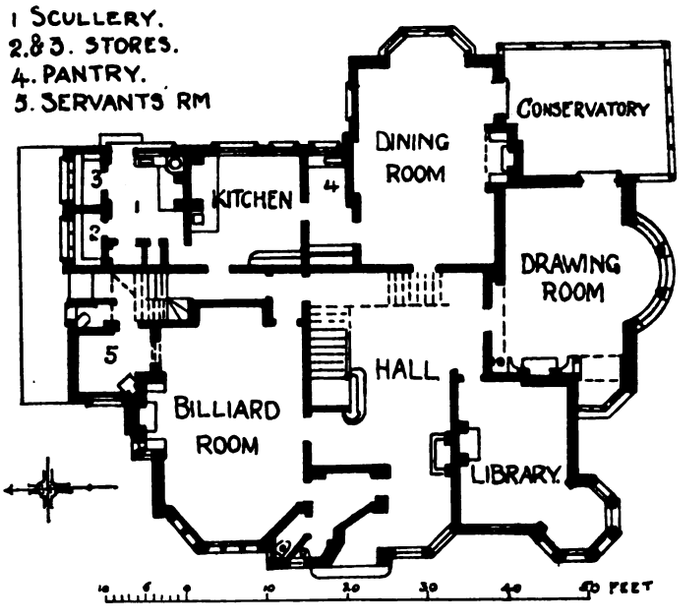

"Bishop's Mead," Hampstead. Plan.

Rome of the 6th century were the mosaics of St. Lorenzo fuori le Mura, and as samples of the 7th century work they had Sta. Agnese. This latter work reached the border line between the earlier and later styles. Thence onward the lecture dealt with the development of the art down to its ultimate decay in the 16th century, soon after which its characteristic qualities were lost in a feeble imitation of the painter's art. The really important work of the 15th century occurred in the Chapel of the Mascoli in St. Mark's, Venice. Here they saw no fatal attempts to rival the painter, such as were soon to bring about the decay and death of the mosaic art. The whole treatment was conventional, but the conventionalism not of ignorance, but of restraint, and one saw throughout the thoughtful care of the mosaist to keep his work within the limits that his material and technique demanded. The 17th and 18th centuries found the art sunk to the lowest depths, but bad as these last examples were, and full of sickly sentiment, they were in the language of their day; but for the modern 19th century work of St. Peter's at Rome not even this could be said; they merely affected the phraseology of a long past time, and in them mosaic was a dead art. The lecturer then briefly alluded to modern work in England, and some excellent examples by Mr. Anning Bell and Mr. Walter Crane were shown on the screen; the work of Burne Jones in the English church at Rome was also shown, and from these designs it was urged that we had the seeds for a revival of what, to quote Ghirlandio's opinion, was the "true painting for eternity." The lecture was profusely illustrated with lantern slides.

GLASGOW ARCHITECTURAL ASSOCIATION.—Under the auspices of the Glasgow Architectural Association a meeting was held on the 13th inst. in the Upper Hall of the Philosophical Society's rooms, Bath-street. The lecturer was Professor Beresford Pite, London. Taking as his subject "Architecture, Registered or Free," the speaker referred at some length to the Architects' Registration Bill introduced into Parliament last year and afterwards withdrawn. He considered that the proper ideal of the architect's education was that of artist and contractor combined. Any proposal to register an architect as an architect was impossible, the profession being on the face of it one requiring freedom.

THE ENGLISH PAVILION, ST. LOUIS EXHIBITION.

THE English Pavilion just completed in the grounds of the St. Louis Exhibition is practically a reproduction of the Orangery at Kew, carried out under the architectural direction of Messrs. Ernest George and Yates, and under the immediate superintendence of Mr. C. Bruce Wood, the chief engineer to Messrs. Geo. Trollope and Sons, of London.

The building has been solidly erected so that it could remain as a permanent building if required. The materials are solid timber and Portland cement upon metal lathing.

Illustrations.

HALL AND STAIRCASE, BISHOP'S MEAD, FINCHLEY.

THIS house was recently erected from the designs of Mr. G. Ernest Nield.

The perspective view shows the interior arrangement of the hall. The whole of the woodwork, including panelling, staircase, and gallery, was painted an ivory white, making a pleasant contrast to the deep crimson paper hung on the walls round the gallery.

A plan of the house is subjoined.

DESIGN FOR SOUTH WALES UNIVERSITY COLLEGE, CARDIFF.

THESE drawings illustrate one of the designs submitted in the competition for the above-named building.

The buildings are arranged round a great central quadrangle, with a view to producing a symmetrical effect. As the library was to be a special feature of the design, it was placed in the centre of the façade immediately facing the principal entrance to the quadrangle, with another entrance and grand staircase in communication from Cathays Park. The great hall on the left of the principal entrance is balanced by the large buildings of the machinery and mechanical section, and all the other departments are compactly arranged so as to be complete in themselves, at the same time allowing free inter-communication, with separate entrances from the quadrangle.

A special feature is made of the tower over the entrance to the library, which it was thought would group well with the dome and smaller towers of the Cathays Park entrance.

The building was intended to be executed in Portland stone, with fire-proof floors and roof; the roofs where seen to be covered with stone slates.

J. BELCHER.

The Student's Column.

ARCHES.—IV.

BEFORE proceeding to discuss the construction of arches in detail, it will be convenient to make clear the meanings of various terms commonly employed by writers on the subject.

The word "arch," standing alone, conveys a perfectly intelligible idea, being generally understood to imply a curved structure, composed of separate and inelastic blocks or of rigid ribs, which is able to retain its pre-ordained position when receiving extraneous support only at its two ends. In the preceding article we have seen that this result can only be attained if in addition to receiving such support the two ends are placed between abutments capable of counteracting the thrust of the arch. Further, we may mention incidentally that the arch is not necessarily a curved structure, so far as the outward form of the material is concerned.

Some complication is introduced by the prefix of adjectives to the simple generic term. We find that arches are designated in accordance with their properties, their construction, their uses or their positions in buildings or other structures, and their architectural features. They are also characterised according to the curve of the lower surface or the method adopted in describing the curve, and to the resemblance of the curve to some familiar object.

In the following definitions we have not attempted any classification, thinking the category will be more useful for purposes of reference if arranged in alphabetical order.

Basket-handle Arch.—An arch of which the intrados or profile of the under surface resembles a semi-ellipse, but consists of circular arcs tangent to each other, forming a curve flattened at the crown. The name was given owing to the resemblance of the curve to that of a wicker-basket handle, and it was assumed, apparently, that basket handles could only be of one particular shape.

Blind Arch.—An arch of which the opening is walled up. Arches are sometimes built in this way for decorative purposes, as beneath windows and cornices in cathedrals; they are also formed in the approaches of bridges, then being intended to meet structural requirements, and afterwards are *blinded* simply to close unnecessary openings.

Braced Arch.—A metal arch consisting of two ribs, or curved members, tied together and stiffened by diagonal or other bracing.

Catenarian Arch.—An arch of which the intrados is a catenary. The *Common Catenary* is the curve assumed by a chain of uniform section and material when suspended at both ends, allowed to hang freely, and loaded with its own weight only. The *Transformed Catenary*,

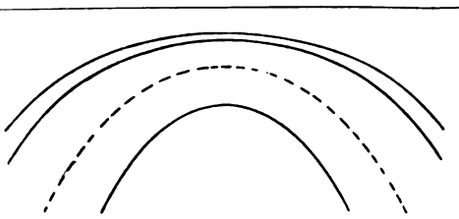

Fig. 27.

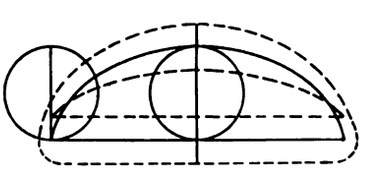

Fig. 28.

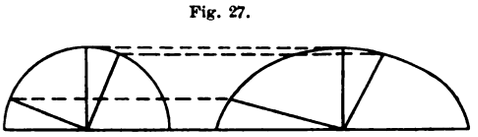

Fig. 29.

Fig. 30.

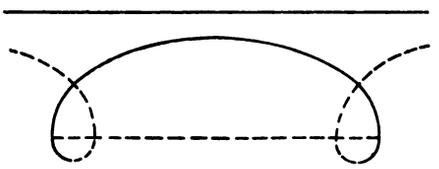

Fig. 31.

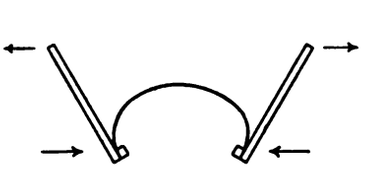

Fig. 32.

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derived by parallel projection from the common catenary, is a flatter curve, the principal use of which is as a figure for arches. As the curve assumed by a hanging chain represents the diagram of bending moments for the load carried, it is evident that the same curve in an inverted form correctly represents the figure of an arch for a similar system of loading. Further, as the chain is in equilibrium, the inverted catenarian curve, when used for the intrados of an arch, is described as the *curve of equilibrium*. The *Two-nosed Catenary* is any transformed catenary in which the ratio of transformation is less than the square root of one-third ($1 \div \sqrt{3}$). In Fig. 27 are represented some examples of catenarian curves inverted. The innermost curve is a common catenary, the next is a two-nosed catenary, and the two outer curves are transformed catenaries.

Circular Arch.—An arch in which the intrados is a complete circle. For resisting uniform normal pressure from without, similar to the pressure due to the thrust of a fluid, an arch should be circular, as under such circumstances the thrust round a circular ring is the product of the pressure per unit of circumference by the radius. The term is frequently applied to arches in which the intrados is part of a circle (see also *Semi-circular* and *Segmental* arches).

Cloistered Arch.—An arch formed by the intersection of two cylindrical arches of equal rise by removing those portions of each cylinder which are above the other and exterior to their common intersection, thus forming re-entrant angles.

Clustered Arch.—A number of arched ribs springing from one column or pier.

Cycloidal Arch.—An arch in which the curve of the intrados is a cycloid—the curve generated by a point in the circumference or on the radius of a circle when the latter is rolled along a straight line. Fig. 28 shows three cycloidal curves generated from a circle, which is represented in two positions, one at the commencement and the other at the middle of its rolling course. If the point by which the curve is generated is in the circumference of the circle the result is the *cycloid proper*, indicated by the middle curve in the figure. If the generating point is within the circle the curve is a *prolate cycloid*, and if without the circle the curve is a *curtate cycloid*, the two latter curves being shown in the figure by dotted lines.

Discharge, Arch of.—Same as *Relieving Arch.*

Dome.—A hemispherical arch which may be described as a vault upon a circular plan.

Drop Arch.—An arch in which the intrados is formed by two circular arcs of equal radius described about an obtuse-angled triangle, the radius of each arc being shorter than the span of the arch.

Egg-Shaped Arch.—An arch form largely used for sewers, in which the intrados is truly *ovate*, or shaped like an egg.

Elastic Arch.—A theoretical idea, in which the arch is considered as an elastic curved beam fixed at its ends. *The theory of the elastic arch* is more particularly suited to the computation of strains in arches of metal and wood, but some types of the masonry arch are suitable subjects for calculations based on this theory. So far as essential principles are concerned there is no difference between arches of metal, wood, stone, and brick, but the nature of the materials used and the methods of construction adopted give rise to various sources of error when the theory of elasticity is applied to the masonry arch.

Elliptical Arch.—An arch in which the intrados is part of an ellipse. This is a form of arch suitable for sustaining the pressure of a mass in which a pair of conjugate thrusts at two points are uniform in amount and direction, but are not of equal value. Consequently the forces acting parallel to any given direction may be represented by parallel projections of the lines that would represent forces acting in a fluid mass. Therefore the profile of an arch intended to sustain such a system of pressures should be the parallel projection of a circle, or in other words, an ellipse. The term is commonly applied to semi-elliptical arches. Fig. 29 represents a semi-elliptical rib transformed from the semi-circular rib, at the left hand of the figure, by parallel projection, the vertical dimensions being unchanged, and the horizontal dimensions extended.

Equilateral Arch.—An arch in which the intrados is formed by two circular arches of equal radius described about an equilateral triangle.

Equilibrated Arch, or *Equilibrated Linear Arch.*—Same as *Linear Arch.*

Extradosed Arch.—An arch in which the curves of the concave and convex faces are concentric or parallel.

Flat Arch.—An arch in which the intrados is a straight line, the voussoirs being wedge-shaped or made with joggled joints. Sometimes the joints radiate to a common centre, and at others they are vertical.

Full-Centred Arch.—Same as *Semi-circular Arch.*

Geostatic Arch.—An arch of figure suitable for sustaining earth or similar vertical pressure. The curve here involved is that of a transformed *hydrostatic arch*. In Fig. 30 we have two arched ribs, the outer one, differing very little from a semi-ellipse, being a hydrostatic rib, and the inner one, differing very little from a semi-circle, being a geostatic rib. The precise figure of a geostatic rib, however, is variable, and can be transformed from a hydrostatic rib by *pulling-out* or *pushing-in*. Pulled-out geostatic ribs are sensibly elliptic.

Groined Arch.—An arch formed by the intersection of two cylindrical arches of equal rise by removing those portions of each cylinder which lie under the other and between their common intersection, thus forming a projecting angle on the concave surface of the arch.

Hinged Arch.—An arch in which hinges or articulations are provided at the springings, and sometimes also at the crown, to permit angular movement. The *two-hinged arch* is articulated at the springings, and the *three-hinged arch* at the springings and the crown.

Horseshoe Arch.—An arch in which the intrados consists of a circular arc greater than a semi-circle, or of part of an *ovate* figure, or of any other curve approximately resembling that of a horseshoe.

Hydrostatic Arch.—A theoretical arch form suitable for sustaining vertical fluid pressure proportional at every point to the depth below a given horizontal plane. In such an arch the radius of curvature is inversely proportional to the intensity of the pressure, and the complete curve is somewhat similar to a trochoid. At a certain point on each side the curve becomes vertical, and if continued each end would form a loop crossing the course of the first curve and forming a second curve at each side (as shown in Fig. 31). Theoretically, the series of arches and loops continue in endless succession. In practice, it is only possible to apply a part of the figure, generally the portion between the two points where the curve becomes vertical. A fairly accurate representation of the hydrostatic arch is given by fixing a piece of flat spring steel to two bars. Then, by pushing in the lower end of each bar and pulling out each upper end (as in Fig. 32), the spring assumes the form of a hydrostatic arch.

Hyperbolic Arch.—An arch in which the form of the intrados is based on the curve of the hyperbola.

Inverted Arch.—An arch in which the intrados is below the axis, or springing line. Also termed a *Reversed Arch*, or, shortly, an *Invert*.

Laminated Arch.—An arched rib built up of several thin plates of metal or of timber boards bent to the required curve and riveted or bolted together.

Lancet Arch.—An arch in which the intrados is formed by two circular arcs of equal radius, described about an acute-angled triangle, the radius of each arc being longer than the span of the arch. The designation is derived from the resemblance of the arch profile to the tip of a lancet.

Linear Arch.—Also termed *Equilibrated Linear Arch* and *Equilibrated Arch.*—A purely theoretical arch, the precise figure of which varies according to circumstances. If we imagine a suspended chain to be inverted without change of figure, and the direction of the load upon and of the stress in the curve to be precisely reversed, the result is a linear arch. The load then acts inwards instead of outwards, and instead of a pull along the curve there is a thrust. The curve for a linear arch under uniform load is parabolic, and under other conditions it may be catenarian, circular, or elliptical. In fact, the precise form may be any curve corresponding with the diagram of bending moments, and representing a condition of perfect equilibrium.

Oblique Arch.—Also termed *Skew Arch.* An arch of which the axis is not perpendicular to the abutments. The oblique arch may be constructed as a distorted form of symmetrical arch, or as a *ribbed oblique arch.* In the latter case symmetrical ribs to the required number are built side by side, each rib being stepped back sufficiently to afford the necessary degree of obliquity for the entire arch.

Oval Arch.—Under this head may be placed various arch forms, equally rounded at the ends and somewhat akin to the ellipse. When used in this sense oval does not imply *ovate* or true egg-shaped arches (*q.v.*).

Parabolic Arch.—An arch in which the curve of the intrados is part of a parabola.

Pointed Arch.—An arch in which the intrados consists of two arcs of equal radius intersecting over the middle of the span.

Rampant Arch.—An arch of which the abutments, or imposts, are at different levels.

Recessed Arch.—An arch built within another arch. Such arches are variously termed *Double*, *Triple*, and *Compound Arches.*

Relieving Arch.—Also termed *Arch of Discharge.* An arch built into the masonry of a wall, across an opening or weak part, for the purpose of transferring vertical pressure to parts possessing ample strength.

Reversed Arch.—Same as *Inverted Arch.*

Ribbed Arch.—An arch consisting of parallel ribs, sometimes made extra deep with shallower masonry between them, thus securing stiffness and reducing weight.

Right Arch.—See *Symmetrical Arch.* An arch of which the axis is perpendicular to the abutments.

Rigid Arch.—An arch composed of a rigid rib, usually of cast-iron or of steel, built as a deep and stiff girder, the stability of which depends upon the stiffness of the rib itself. A rigid-arched rib is generally rounded at the springings to permit a certain amount of angular motion. It then becomes a two-hinged arch. A rigid arch may also be hinged at the crown as well as at the springings. It may then be regarded as consisting of two semi-ribs, and is described as a three-hinged arch.

Segmental Arch.—An arch of which the intrados is a circular arc less than a semi-circle.

Semi-Elliptical Arch.—An arch of which the intrados is a semi-ellipse. Often described as an elliptical arch. Many arches termed "semi-elliptical" by courtesy exhibit curves that would be more correctly described as *hydrostatic* or *oval.*

Semi-Oval Arch.—An arch of which the intrados is of semi-oval form.

Skew Arch.—Same as *Oblique Arch.*

Stereostatic Arch.—The stereostatic rib is a term applied by Rankine to the most general case of an arched rib balanced by two conjugate loads. The precise shape of the rib is necessarily variable and the theorem of the stereostatic arch can only be solved approximately and after considerable labour.

Stilted Arch.—An arch of which the true impost is at a higher level than the apparent impost, or of which the piers are in reality carried higher than the apparent impost, so that a portion of the intrados on each side of the arch is vertical.

Surmounted Arch.—A stilted semi-circular arch of which the rise is greater than the radius of the circle.

Symmetrical Arch.—An arch of which the axis is perpendicular to the abutments. The term symmetrical may also be applied to the geometrical repetition of one half of an arch by the other half, but with the parts arranged in reverse order.

Three-Centred Arch.—An oval arch in which the curve of the intrados approaches that of the ellipse, and is formed by three circular arcs.

Vault.—A cylindrical arch, the cross-section of which may be of any curved geometrical figure.

HARROGATE MASTER BUILDERS' FEDERATION.—The Harrogate and District Federation of Master Builders held their annual dinner at the Wellington Hotel, Harrogate, on the 14th inst. The President (Mr. T. Raynor) occupied the chair, and was supported by the Mayor (Mr. H. Milling), Alderman Fortune, Mr. J. Turner Taylor (Town Clerk), Mr. E. Good (Hull), Mr. T. Butler Wilson (Leeds), Mr. A. A. Gibson, and Mr. E. Marshall. The toasts included "The Mayor and Corporation," which was proposed by Mr. T. Butler Wilson, and responded to by Alderman Fortune. Mr. E. Good proposed the toast of "The Federation," which was acknowledged by the President. M. R. Airton submitted "The Architects," and Mr. T. E. Marshall replied.

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Correspondence.

R.I.B.A. AWARDS.

SIR,—There is one advantage possessed by those who are not serving on the Council of the Institute in that they are free to criticise the awards made. There are two instances in which I think they are not quite justified this year. In the Tite competition the prize ought to have been awarded to No. 11, "The Red Shield," both for design and drawing. To No. 3, "Bridge," I should have awarded the medal of merit, and am quite at a loss to understand why one of the weakest set sent in, both in design and drawing, should have been deemed worthy of an extra prize. In the Owen Jones competition I should consider that Mr. McLachlan would be much better able to scheme out colour decoration for a building than Mr. Richardson, and quite capable of selecting a good colourist to carry it out; and that is probably one of the objects which Owen Jones had when he offered the prize. There are plenty of women artists who could make much better copies than those produced by Mr. Richardson, and, as this is the second, if not the third, time that Mr. McLachlan has sent in, the neglect to reward his work is all the more to be regretted. At all events, I desire to call the special attention of those visiting the exhibition next week to the exceptional beauty of Mr. McLachlan's drawings.

I think it would be fairer to the students if on this one occasion in the year the Council were to meet at 3 p.m., and settle the awards before the regular Council meeting, instead of trusting to chance to have a comparatively short time to go through the reports of the committees of experts appointed by the Council for each subject, between the Council meeting and the dinner.

R. PHENE-SPIERS.

WHAT IS A BUILDING?

SIR,—It appears to me that there are some people who seem to think that they are at liberty to erect any kind of building or structure without coming into contact with any authority. It has always been most unfortunate that no Building Act contains a definition of a "building." I have not seen the buildings referred to in your last issue, but it is perfectly clear that they must come under one of three heads:—

(1) If they are buildings which comply with the regulations of the London Building Act, the District Surveyor can deal with them.

(2) If they are buildings which do not comply with the Act, then they are special buildings, for which the consent of the London County Council should be obtained, under Section 82.

(3) If it is the intention of the owners to erect the buildings for a temporary purpose, then the consent of the L.C.C. must be obtained under Section 83.

London contains hundreds of buildings which have been erected without the knowledge of the authorities, and they are so dangerous and unsightly that nobody can blame the District Surveyor for keeping a careful watch to prevent their increase.

HENRY LOVEGROVE.

RISK OF FIRE IN BUILDINGS.

SIR,—At the present time, when we hear of so many outbreaks of fire in buildings, both public and private, would it not be worth while to know whether there is any table published giving the percentage of fire risks to every class of building. And, if so, it should form a valuable guide to those about to design as well as those interested in the management of public buildings. By such a table one should be able to learn the risk from fire a certain class of building is put at from actual records, and so take the necessary precautions to provide against the percentage of danger.

ANDREW SOUTH.

RUBEROID ROOFING.

SIR,—Following our communication, which appeared in your issue of the 26th ult., regarding the fire-resisting qualities of Ruberoid roofing, and in which we stated that we had not heard of a single instance of a fire occurring in this country where it had been used, we now beg to say that the fire in Piccadilly on the 13th inst. confirms in every respect what has been reported from other countries of the fire-resisting qualities of Ruberoid under big conflagrations.

The foreman's office, erected at the corner of Piccadilly and Arlington-street, on the site of the new Ritz Hotel, was covered with one-ply Ruberoid roofing, which is one of the thinner grades, and although the flames were licking the roof for five and a half hours it made no appreciable effect, and consequently the woodwork was preserved and the roofing is almost as good as when laid.

ROBERT BLACKWELL AND CO., LTD.,
per Chas. Brock.

WITHAM PARISH CHURCH.

SIR,—An incident related to me by the present rector forms a droll appendix to your interesting account of this beautiful old church.

It seems that a former rector could see no use for the late fifteenth century screen inside the church, and thought it more useful and ornamental as railing for the rectory garden. It was taken down, sawn up, and used in this and similar positions. When this gentleman was preferred—I think to Winchester—his parishioners were at a loss to know how to fittingly perpetuate the memory of his sterling qualities.

After some discussion it was decided to pull down the aforesaid garden railings and re-erect them in screen form once more inside the church. This was done, with an inscription in memory of the Rev. Vandal in question.

PERCY BACON.

ROYAL COMMISSION ON LONDON LOCOMOTION.

ON Thursday last week, at a sitting of the Royal Commission on London Locomotion, held under the Chairmanship of Sir David Barbour, evidence was given by Sir Douglas Fox, who was joint Engineer to the Liverpool Overhead Electric Railway, and has been engineer to a number of the tube railway schemes before Parliament. He expressed the opinion that short local traffic could best be met by motor omnibuses and surface tramways, but the only method of dealing with traffic coming from the suburbs into the heart of the City was by tube railways. While shallow subways for tramways were feasible, he believed the cost would be prohibitive. The secret of the success of the tubes had been the placing of the tube in London clay, below the made ground and water-bearing strata which overlies the clay. The damage done to St. Paul's Cathedral by the construction of a sewer in the gravel showed plainly what would be the effect of the pumping which would be necessary in constructing subways under the surface where shields could not be used. He strongly advocated the establishment of a permanent tribunal to deal with all schemes affecting London locomotion. Witness said he was Deputy-Chairman of Sir S. Waterlow's Company for Improving the Dwellings of the Industrial Classes, and for over thirty years had taken an active interest in this important question. Undoubtedly, people preferred to live outside London, where they could afford the time taken up in travelling and the expense of the same, but he did not think that was feasible, except for those of the working classes who were comparatively well off. The London County Council's estate at Tooting was very nice in its way, but he did not think it was altogether satisfactory as a solution of the housing problem. The London County Council had practically thrown away all the advantages of the cheaper land by accommodating fewer people on it, with the result that their rents, plus travelling expenses, were nearly as high as in the block buildings in London, so that by obtaining cheap land they had not done anything to house those who could not afford to pay the rents in the dearer parts. His company's rents averaged 2s. 3d. per room per week, taken over all the estates. To take a modern instance, they erected a block of buildings in the Old Kent-road—a small block, and, therefore, proportionately more costly—in 1899-1900, with a rent of 3s. per room per week, and, after allowing for all expenses, including sinking fund and redemption of the cost of the buildings in ninety years, and a ground rent of 2¾d. a foot super., there was a balance left sufficient to pay 3*l.* 18s. per cent. on the capital expenditure. This was without making allowance for empties. Municipal housing was undoubtedly expensive compared with a company's, for, in addition to their buildings costing more per foot cube, they had to repay the cost of the land, estimated at its housing value, and the building in sixty years. The practice of the London County Council was to write the land down to housing value. The system of the Metropolitan Board of Works was to clear the site and put it up to auction for housing purposes, and they got the best price they could for it. His company had hardly ever built on land at its full commercial value, except in the earlier days—it had either been written down as an improvement by the local authority, or else let by the ground landlord at a reduced rent. For instance, the company only paid 2d. per foot super. for the Grosvenor estate between Oxford-street and Grosvenor-square. He hardly knew what the phrase "rents ruling in the neighbourhood" meant, for the rents charged by his company for their rooms per room were always lower than those charged round about; but the rents charged by the company were generally considered by the people to be higher because of the stringent regulations which the company made as to overcrowding. As the company would not allow overcrowding, it was possible for a man to house himself and family in the vicinity cheaper than in the company's tenements, but not under proper sanitary and moral conditions. He thought it probable that in the near future rents in the outlying parts would have to be increased, as the rates were going up. Another thing calculated to thrust up the value of suburban property was the increased facilities of access. He believed it would be possible for private enterprise to hold its own with municipal building for many years to come, but when the time of redemption was passed the County Council would be able to reduce the rents below those which the companies would be able to charge, as the companies naturally expected to get a return for the capital outlay. His company was not at present getting so prosperous a class of tenants as they did a few years back, and he attributed that to the fact that men earning higher wages went further afield into the suburbs, and the tenements they used to occupy were now occupied by a somewhat poorer, but most respectable, class, who were only too glad to get decent accommodation near their work. He thought this was a proper solution of the problem, as it brought about a general process of levelling up.

At a further sitting of the Commission, under Sir David Barbour, on Friday, Mr. A. C. Morton, Chairman of the Streets Committee of the City Corporation, put forward the views which his Committee had arrived at with regard to the establishment of a tribunal to deal with all questions of London locomotion. It was considered that the members of the tribunal should be paid, and should devote their whole time to the work. They should consider the schemes presented to them, and report from time to time on the subject of the traffic and locomotion in London generally, but should not have power to direct improvements to be carried out. They should report on local improvements required and on locomotion generally. The tribunal should not be responsible for the supervision of works. They should include in their general reports the streets which, in their opinion, should be made or widened. All tramway schemes should be settled by the tribunal, subject to the rights of local authorities. The tribunal should have the power to confer compulsory powers in regard to the acquisition of property upon promoters of schemes; they should have power to compel existing companies to carry out new works, after hearing all parties interested, who should have the right to be represented in the manner they thought best. The powers of the tribunal should be retrospective, and they should, as far as possible, have a settled policy of action, so as to insure continuity of principle. The road authorities should have complete control in regard to the opening of streets in their respective districts. The tribunal should have the power to apportion the cost of improvements, according to the advantages derived from the same, in districts contiguous to those in which improvements are effected. The tribunal should settle all questions in dispute between local authorities and companies and promoters of schemes of proposed improvements or for facilitating locomotion.

Replying to Sir J. Wolfe Barry, witness said there was no doubt that the Holborn Viaduct had greatly relieved traffic, and he did not think the City regretted having gone in for that.

Alderman Sir Henry Edmund Knight was then called, and, in the course of his evidence, suggested the construction of suspension bridges at such points as Ludgate-circus and Oxford-circus. A suspension bridge would leave the whole of the roadway below it quite free, and might be made an ornamental feature of the streets. On the question of tramways, witness considered that they were of great public utility where streets were wide and not congested with other traffic, but they would be impracticable in the City, and should not be permitted in any town unless the lines could be laid 20 ft. distant from the kerb. With regard to heavy goods traffic, witness was of opinion that the remedy was for it to come out of the streets altogether. He suggested two zones or ellipses of underground electric railway, one about a mile north or south of the river, and a second about a mile or a mile and a half further out. These railways would have two sets of rails each, and the tubes should be made to carry the ordinary railway stock.

The Chairman: Have you any idea how long the lines would be?

Witness: Yes, about forty miles; the expense would be heavy, but he believed it would pay for itself. All railways bringing goods into London should be compelled to make connexions between the suggested railways and their goods stations. Depôts on the railway

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should be about a mile apart. Large establishments on the route might be accommodated with sidings to themselves, the goods being lifted to the surface by lifts. There should be sidings at docks also. Goods that could not be carried underground, such as builders' plant, should be carried by motor traction, delivery being limited to certain hours. The cartage of coal was responsible for a great deal of traffic, and he considered that the use of coal in London should be interdicted, and gas substituted for heating and cooking.

Questioned as to his suggestion to have suspension bridges, witness said that at Oxford-circus there were some six or seven lines of traffic, and the necessary width taken up by the bridge would be only 26 ft., so that it would not interfere with the shops at that point. A gradient of 1 in 30 would be sufficient and the height of the bridge need be only 14 ft.

COURT OF COMMON COUNCIL.

THE first meeting of the Court of Common Council after the Christmas vacation was held on Thursday last week at the Guildhall, the Lord Mayor presiding.

Among the petitions received was one from a number of Clapton residents, asking for financial help towards the expense of acquiring the Springfield Estate, Upper Clapton, for the formation of a new park. Mr. Howes, who appeared for the petitioners, stated, in answer to questions, that the estate had been offered for the sum of 40,000*l.*, but the offer extended to March only. The Hackney Borough Council had voted 10,000*l.* towards the scheme, and the London County Council 20,000*l.* The upkeep of the park would be undertaken by the London County Council. The committee for the acquisition had raised some 4,000*l.*, and it was hoped that more might still be raised locally. About 6,000*l.* was therefore the amount required.

There was some discussion when the speaker for the petitions withdrew, and eventually, on the motion of Mr. Lile, seconded by Mr. Fortescue, the petition was directed to lie on the table.

On the recommendation of the Streets Committee, it was agreed that the carriage ways of the undermentioned streets be paved with creosoted deal blocks, laid on Portland cement concrete, at a total cost of 1,277*l.* 10s.: Circus-place, Finsbury-circus (between Circus-place and East-street), Pilgrim-street (portion), and New Hill-street. The same Committee reported on two letters received from the London County Council, relative to certain building proposals in the City. The first letter referred to an amended application by Mr. H. Chatfeild Clarke, on behalf of the Indemnity Mutual Union Assurance Company, for consent to the erection of a projecting balcony over the entrance to No. 1, Old Broad-street. On the recommendation of the Committee it was agreed that the Council be informed that the Corporation disapproved of the proposal as shown upon the plan accompanying the application. The second letter had reference to an application by Mr. R. M. Roe for consent to the erection of a building in Basinghall-street, abutting upon Church-alley, on the site of St. Michael Bassishaw. The Committee had no objection to offer to this, and it was agreed to inform the London County Council accordingly. Other recommendations of the Committee were that certain repairs and repainting be carried out at a number of underground conveniences in the City, at a cost of 500*l.*, and that wire baskets for the reception of orange peel, etc., similar to those attached to the street orderly bins in Poultry and Cheapside, should be fixed on all the remaining bins in the City, at an estimated cost of 230*l.*, including those on trial. These recommendations were agreed to. A resolution passed at the Bishopsgate Ward-mote, urging the necessity of the widening of Bishopsgate-street, near Norton Folgate, being carried out at the earliest possible moment, was received without discussion, and among other correspondence received was a copy of a letter addressed by the Board of Trade to undertakers under Electric Lighting Orders, 1889, 1895, 1898 No. 2, and 1899, conveying the Board's formal consent to the transmission of electrical power up to 2,000 kilowatts in certain trunk mains; a letter from the same authority sanctioning the appointment of Messrs. H. Mettam and T. L. Davis as Sanitary Inspectors in the City of London; a resolution of the Vestry of the Parish of St. Giles Without, urging the desirability of completing the purchase of the land on the north-west end of the parish church at as early a date as possible; and a letter from the Ward Clerk of Farringdon Without, forwarding a copy of a report of the Ward Committee, adopted by the Ward-mote, containing the following recommendation: "That the Corporation should not contribute towards the cost of forming the proposed roadway from Giltspur-street to King Edward-street, as this is entirely a business matter on the part of the Governors of Christ's Hospital in developing their building estate."

GENERAL BUILDING NEWS.

REOPENING OF COTTON CHURCH, SUFFOLK.—The Church of St. Andrew, Cotton, has been closed for nearly two years, owing to the unsafe condition of nave and aisle roofs. The nave roof has now been restored, and the restoration of north and south aisles has been entered upon. The cost of the work has been just under 2,000*l.* Mr. P. L. Groom, of Ipswich, has carried out the work, under the supervision of Messrs. Bisshopp and Cautley, the architects.

ST. MARGARET'S, DALTON-IN-FURNESS.—The Bishop of Carlisle dedicated St. Margaret's new church at Dalton-in-Furness on the 13th inst. The church has been erected to take the place of an old iron building, which had done duty for thirty years. The new structure has been built to the plans of Mr. Bassnett Preston, of Manchester, at a cost of 4,200*l.*

PROPOSED EXTENSION OF CHELL WORKHOUSE, STAFFORDSHIRE.—At a meeting of the Wolstanton and Burslem Board of Guardians on the 12th inst., a report was received from the Board's Architects, Messrs. Slater and Walley, with respect to the proposed erection of a new infirmary and additions and improvements at Chell Workhouse. The plans provided for additional accommodation for about 120 inmates, and the work involves an estimated expenditure of 12,500*l.* On the recommendation of the Workhouse Committee, it was decided to submit the plans to the Local Government Board for their approval, and to apply for sanction to borrow 12,500*l.* for the purpose of carrying out the scheme of extension and improvement. The Guardians further resolved to instruct their architects to prepare plans and advertise for tenders for supplying the Workhouse with an electric light installation.

COUNTY COUNCIL SCHOOLS, BLYTH.—The new public schools at Crofton, Blyth, erected by the Northumberland County Council at a cost of 11,000*l.*, were opened on the 11th inst. The schools are one-story in height, and provide accommodation for 750 scholars. The plan adopted permits of further extensions to increase the sitting accommodation to at least 1,050. Messrs. Braithwaite and Co., of Heaton, were the contractors; Messrs. Shaw and Vowles, Burnley, architects; and Mr. H. Bower, Blyth, clerk of works.

DRILL HALL, BEDFORD.—A new drill hall has been erected for the 3rd Volunteer Battalion Bedfordshire Regiment at the corner of Gwyn-street and Greenhill-street, Bedford. The work has been carried out by Mr. C. Negus, builder, of Bedford, from the plans of Mr. H. C. Inskip, architect, also of Bedford.

POLICE STATION FOR NEWPORT, MON.—Mr. W. A. Ducat held an inquiry at Newport Town Hall recently on behalf of the Local Government Board, into an application made by the Corporation for leave to borrow 4,430*l.* for the purpose of building a new Police Station at Pill. The Town Clerk (Mr. A. A. Newman) explained that the total amount proposed to be borrowed, 3,995*l.* 16s. 6d., was the estimated cost of building the place, and 434*l.* 10s. for the purchase of the site, which is a portion of the surplus lands purchased from Lord Tredegar for the purpose of erecting the transporter bridge. The Borough Engineer explained the plans, which provide on the ground floor for five cells and a drunkard's cell, on the first floor quarters for a resident sergeant or inspector, and at the rear of the sergeant's house rooms for four single constables. The cells and cell corridor would be in white glazed bricks, and constructed entirely in accordance with the regulations of the Prisons' Department of the Home Office. Hot water heating would be provided, and electric light.—The Inspector subsequently viewed the site.

INFIRMARY, SWANSEA.—At the Swansea Union, Mount Pleasant, on Monday, the opening of the new infirmary block of buildings took place. The architect was Mr. W. H. Wills (London), and Messrs. Lloyd Bros. (Swansea) have carried out the building work, which has taken over two years to complete. The whole undertaking cost about 17,000*l.*

SUTTON COLDFIELD TOWN HALL.—In our short description of this last week the names of the architects were given as "Mason and Eddison"; it should have been "Mayston and Eddison." The mistake was not ours.

ENGINEERING STANDARDS COMMITTEE.—The Council of the Institution of Civil Engineers have nominated their President, Sir William Henry White, K.C.B., F.R.S., to fill the place of the late Sir Frederick Bramwell, Bart., as one of the representatives of that Institution on the Engineering Standards Committee.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Frederick Wheeler, architect, of 6, Staple-inn, London, and Horsham, has taken his son, Mr. C. W. F. Wheeler, into partnership, so far as his London practice is concerned, which will in future be carried on at the above London address under the name of Frederick Wheeler and Son.——An agreement has been entered into between Messrs. Wm. Lee, Son, and Co., Ltd., lime and cement manufacturers, of 15, Upper Ground-street, Blackfriars, and Messrs. Eastwood and Co., Ltd., brick manufacturers, of 47, Belvedere-road, Lambeth, for the amalgamation of the retail businesses of the two companies. For the purpose of carrying out this agreement a new company has been formed, under the style of Lee and Eastwood, Ltd. The chairman of the new company will be Mr. S. Lee Smith, of Messrs. Wm. Lee, Son, and Co., and Mr. George E. Wragge, of Messrs. Eastwood and Co., will join the board.

EXHIBITION, BRADFORD.—Mr. W. C. Lupton presided on the 6th inst. over a meeting of the Bradford Cartwright Memorial Hall Committee, who have in hand the arrangements for this year's exhibition in Lister Park, in connexion with the opening of the hall. The Building Committee reported that the industrial hall would be roofed in a fortnight. The concert hall will accommodate 2,000 people. Tenders for the erection of the illuminated bridge have been invited, and the building of the water chute has been commenced.

FALL OF COPING STONE.—In the Paddington Coroner's Court on Saturday last, Dr. Danford Thomas held an inquest on the body of A. J. Mardell Dores, aged 31 years, a carpet planner, of Blemheim-terrace, North Kensington. The deceased was the victim of a sudden collapse of coping stone or cornice overhanging the premises of Mr. William Mardell, upholsterer, etc., 216 to 220, Westbourne-grove. Mr. S. F. Clarkson, District Surveyor for the London County Council, said that the work in progress in Mr. Mardell's shop had nothing to do with the accident. The fact was that the original construction of the cornice or coping was defective. Quite thirty tons of stones and bricks were precipitated some 30 ft., and the bricks were so clean of mortar as to suggest that there was no proper pointing. He produced a sample of the mortar, and it crumbled in the coroner's hand. The witness added that he was afraid there were a good many buildings of the same sort in the district, but he had not long been appointed, and, of course, he had not had time to make a complete inspection. The jury returned a verdict of "Accidental death."

COLLAPSE OF A ROOF AT SUNDERLAND.—An accident, which resulted in the loss of one life and severe injuries to a number of other persons, occurred on the 15th inst. at the engineering works of Messrs. John Lynn and Co., Pallion, Sunderland. Some ten or eleven men were engaged inside a core-drying stove, when the roof fell in and buried them. The drying stove was a square brick building, with a roof of cast-iron plates covered with clay. The building was supported on girders, and it is supposed that the cause of the accident was the sudden collapse of one of these girders. It was shortly before three o'clock when the heavy roof fell and pinned to the earth the majority of the unfortunate men employed on the spot. No time was lost in starting the work of rescue, but the task of extricating the injured was very difficult. One man named Stephen McFarlane had been terribly crushed under a girder, and was found to be dead, while seven other men were conveyed to the infirmary, where it was found that several of them had sustained shocking injuries.

HEREFORD MASTER BUILDERS' ASSOCIATION.—The members of the Hereford and District Master Builders' Association dined together at the Mitre Hotel, Hereford, recently. Amongst the company were Mr. Powell (President), Mr. E. W. Wilks (Vice-President), and the Mayor (Alderman H. C. Beddoe). The President proposed the toast of "The King and Royal Family," and Mr. W. A. Linton next submitted "The Town and Trade of Hereford," and in alluding to the architecture of the city spoke of the noble cathedral, which he said gave visitors and Herefordians alike food for reflection. Whenever he looked upon that beautiful building he could not help thinking what manner of men they must have been in the old days, and what a wonderful love they must have had for their art and work.—The Mayor, in response, said he was glad to hear Mr. Linton's remarks with regard to the grand old cathedral; what Mr. Linton felt was also felt by a great number of people who came to Hereford, and also by the citizens themselves. It was one of the finest cathedrals in the west of England, and possessed beautiful Norman architecture. Various restorations had been effected, especially since the falling down of

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the west end some 110 years ago. The Dean had latterly taken the west end in hand, and a great improvement was being effected. The city had done good work in improving the dwellings of the poor, and there was not one single member of the Corporation, whatever his general views might be, who did not desire to see the proper housing of the poorer classes. At one time Hereford was a walled-in city, and within his remembrance there were formerly very few buildings outside the limits of the old city. They attributed this to the attacks of the Welsh; people sought the protection of the walls. There was very little property around the city he had not had something to do with at one time or another. It formerly belonged to the Ecclesiastical bodies, but an Act was passed about fifty years ago which gave power to the Ecclesiastical bodies to sell, and since then very rapid strides had been made.—Mr. Witts also responded.—Mr. Arkwright then proposed "The National Federation of Master Builders of Great Britain and Ireland, and the South-Western Federation of Building Trade Employers." In the course of his remarks he said that the question of the timber supply was a matter of the most vital interest to the building trade, because whatever might take the place of timber for building purposes, they would not advance sufficiently in scientific knowledge in order to produce a material which could be subsituted for timber to any large extent for a considerable number of years to come. He thought he might say without fear of contradiction that anything like a serious shortage in the supply of timber would be a very grave matter for the building trade. It would be a grave question not only for the master builders, but also for the men working in the trade, and indeed he might say the nation at large. What were the facts as they found them? He was afraid that not only this country, but the whole of Europe, would be faced within the next thirty years with something like a very serious timber famine. Builders were now paying prices for timber which was called first class, which they would have regarded as second class and paid for at a lower rate ten years ago. He believed it was a fact that 78 per cent. of the English timber trade was done in coniferous timber. A very large proportion of the timber came from abroad. He believed that in every contract which the Government made, a clause was put in to the effect that no English timber was to be used. Other people made the same stipulation, and therefore they had arrived at this point, that for some reason or other English timber was deteriorating from a builder's point of view, and that the foreign supply was failing, and consequently becoming dearer. The reasons why the foreign supply was dearer were two-fold. In the first place there was less timber, and, secondly, it cost more to place it on the market than it used to do. This was perhaps not apparent at first sight, but it was easily explainable. In the early days, when they were cutting down virgin forests—trees planted in dense patches with no branches except at the top, where they caught the sunlight, and therefore having no knots—the facilities offered by the Norwegian rivers were fully taken advantage of. The trees were cut down on the banks, marked, rolled into and carried by the river, and recognised by the respective agents of the owners at the bottom. Thus a considerable saving was effected. Now, however, things had altered. As trees were cut down, the river became further and further away, and thus there was the cost of hauling, etc., which sent up the price. The foreign supply was growing less and less every day, and the English timber, not to put it at too fine a point, was not fit for use. Let them examine for a moment the extent of the English timber trade. Why was it that the Government did not allow English timber to be used in their contracts? Why was it that the whole of the building trade had so little to do with English timber? He excepted oak. The reason was because the English trees were not of much value as timber. This was because of the numerous branches, which created knots in the wood. That was the plain and simple reason. If they went into an English woodland, of course it was very beautiful, but then it did not provide good timber. The German and the French system of timber growing, encouraged by the Governments, was based on scientific and commercial principles. They grew a great many more trees to the acre than the English did. The object was to secure a long straight stem without branches except at the top. Ordinary timber was practically useless, and that was why they depended so much on a foreign supply. The report of the Forestry Commission laid it down that the timber grown in England could be grown on less than half the acreage it now occupied. The English timber was what might be described as of third-rate quality. These questions necessitated serious consideration at the hands of the British Government.—Mr. Dowling first replied, and said that the object of the two federations was their uplifting as builders. These federations had given them more prestige, and had secured a different and a better form of contract. — Mr. Cowlin, treasurer of the South-Western Federation, also responded, and said that the question was very often asked: "What is the use of a federation?" Well, the building trade came next to the coal and iron trade in the matter of importance, and it was essential that their interests should have every protection. Architects and employees had national institutions, and therefore it was imperative that the builders should similarly band themselves together. Local associations were part of the national, and therefore they should be supported. The very existence of the National Federation was a great factor for peace.—Mr. C. Cooke gave the toast of "The Architects and Surveyors of Hereford," coupled with the names of Messrs. A. R. Groom, J. Parker, and A. Dryland, who responded.—Mr. Langford proposed "The Hereford and District Master Builders' Association," and the Chairman replied.

BEDFORD BUILDERS' ASSOCIATION.—The second annual dinner of the resuscitated Bedford Builders' Association was held at the Central Restaurant, High-street, recently, Mr. Richard Black, President of the Association, occupying the chair. After the loyal toast had been honoured, Mr. Charles Negus proposed "The Mayor and Corporation," and Alderman Burridge responded. Mr. Guy Pym next proposed "The Builders' Association." In a town like Bedford a building association must be one of very great importance. The whole town was at the mercy of the builders, and if they did not recognise their responsibilities the town would suffer in the character of its buildings, and these, in their influences on the people inhabiting them, would bring about the unpopularity of the town. Sixty or seventy years ago people were content to live in any sort of a house, and the countryside was made hideous with buildings which looked as though they had been built by the mile and cut up into sections; but there had been a distinct improvement, and the charming variety of houses now was quite a feature. Labour was a most important question, and an exceedingly interesting one. It was a subject which would have to be taken into account more and more every day in relation to every productive industry in the country. If they went to the United States they would find that the spirit which filled the mind of every working man was that he would do his best, and do the greatest amount of work during his hours of labour. He went to his work every day with the intention of sticking to it from the moment he commenced to the moment he put his coat on to leave the factory. His friend, Mr. Black, who had had a large practical experience in the United States, told him that the masters paid double the wages they paid here, but they could afford to do it because the men gave the full value in their work. That was a thing for them all to consider, independently of politics. American people ran the risk of buying expensive machines because they knew they had made it to the interest of their workmen to get every possible bit of work out of the machines. He coupled the name of the President with the toast.—In response, Mr. Black said that anyone who knew anything about the building trade in Bedford must know that it was time such an Association was revived again. For the last two or three years it had not been always easy for Bedford builders to discharge their duties in a way they ought to be able to do. It was felt that undue pressure was being put upon them and that they were hindered in performing the duties they had an honest desire to perform. Since the re-formation of the Association that sort of thing had been partially, if not altogether, remedied. An important matter which affected builders was the form of giving out work in the borough. Many thousands of pounds had been spent in a manner which did not recommend itself to the builders of Bedford. They were absolutely unanimous on the point that all public work done out of the public funds raised by rates should be publicly tendered for. Every man should have an opportunity of tendering for that work on his merits.—Mr. Valentine proposed "Town and Trade of Bedford," and Mr. Randall responded, and Mr. R. Melcombe proposed "The Visitors," coupled with the names of Mr. Lindley and Mr. J. P. White.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual meeting of this Association was held, on the 18th inst., at the Guildhall, Small-street, under the Presidency of Mr. Alfred Dowling. After the reading and confirming of the minutes of the last annual gathering, the Secretary, Mr. Henry J. Spear, presented the annual report, of which the following is an abstract:—The building trade of Bristol during 1903, like many other trades, has been of a relaxed character. Only one little misunderstanding between masters and men has taken place, and that was speedily settled by requesting the member to conform to the rules. The Plumbers' Registration Bill was again introduced into Parliament, and the Association requested the four members for the city to oppose the measure, it being considered useless and unnecessary, and not in any way safeguarding the public from bad work, with its consequent ill-effect on health. The Association also approached the four Bristol members, asking them to support the appointment of a Royal Commission to inquire into the question of municipal trading, and such committee had been appointed, and specially considered the question of sanitary work. Two bills were presented to Parliament dealing with the law as regards trade disputes and liability of trades unions, and the Association unanimously passed a resolution: "That the Bristol Master Builders' Association has carefully considered the Trades' Disputes Bill now before the House of Commons, and is of opinion that the motion by Mr. Galloway, M.P., upon the second reading, should receive the hearty support of all members of Parliament. That this expression of opinion be conveyed to them and the South-Western Federation." The outcome was that the Bill was referred to a Select Committee of the House of Commons. A bill dealing with the Extension of the Powers of Compensation Act, 1898, to all trades, irrespective of locality or height or depth of building, was considered by the Association, but no action was taken thereon. The following resolution passed by the Association in 1901, dealing with the question of time limit, was re-confirmed this last year, and the members were urged to rigidly adhere to same: "That no member of this Association shall tender for work in competition where he is required to state the time in which he will complete the said work." Acting upon the advice of the Association solicitor, Mr. W. H. Brown, the Association considered the various clauses in the Corporation contracts then in vogue, and accepted certain alterations, but declined to send in priced bills of quantities with tenders, as being contrary to the recommendation of the National Federation of Building Trade Employers of Great Britain. National Federation meetings have been held in London and Cardiff, and the Association had been duly represented at both. At the latter, the gratifying announcement was made that after years of negotiation a satisfactory form of contract, drawn up by the R.I.B.A., the Institute of Builders, and the National Association of Master Builders of Great Britain and Ireland, had been actually accomplished, and it was described as one of the most satisfactory undertakings ever brought about by those associations. — The Hon. Treasurer (Mr. G. Humphreys) presented his financial statement, which was of a satisfactory character. The President then proposed the adoption of the report and accounts, and said it was his pleasure and privilege to do so, for he considered the report to be a succinct *résumé* of the work performed by the Association during the past twelve months, and to his mind it proved the value of such organisations. Through the courtesy of their secretary, he had been favoured with the most recent return of the Board of Trade, from which he observed that there was a general wave of depression in the building trade through the country; but he trusted that business would generally revive, so that the building trade might follow in the wake of contentment at home and abroad. Although the building trade in Bristol during 1903 was rather quiet, yet it compared very favourably with other large centres in quantity and character of work done. Among the many subjects which received attention were the Corporation form of contract, the question of sending in priced bills of quantities, and the stating of time by which the contract would be completed at the time of tendering. In both of these cases it was decided to rigidly adhere to the rules by not stating the time or sending the priced quantities unless successful. Mention must be made of the annual outing, which was well attended by members, visitors, and fine weather, across the Mendip Hills to Wells, which gave an opportunity for members to become better acquainted with each other.—Mr. F. N. Cowlin seconded the adoption of the report and accounts, and the proposition, having been put to the meeting, was carried unanimously. The President then said it was his pleasing duty to propose Mr. E. I. Neale as President of the Association for the current year. This, having been seconded, was carried unanimously. Upon the motion of the President, seconded by Mr. E. Walters, the following resolution was carried with acclamation: "That the heartiest thanks of this Association be accorded to Mr. Alfred Dowling for the assiduous manner in which he has presided over the deliberations of the Association during the past year, thereby maintaining the usefulness of the Association in furthering the various objects it endeavours to accomplish." On the

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motion of Mr. G. Wilkins, seconded by Mr. A. Krauss, it was resolved that Mr. F. R. Ridd be elected the Vice-President of the Association for the ensuing twelve months, and it was carried unanimously. At the instance of Mr. W. Foster, seconded by Mr. F. A. R. Woodward, Mr. George Humphreys was re-elected the hon. treasurer to the Association. The election of the committtee was then proceeded with, and delegates were appointed for the forthcoming annual meeting of the National Federation in London, and also delegates for the South-Western Federation. The question of the audit of municipal accounts and other subjects of interest to the trade were then discussed.

Legal.

BUILDER'S APPEAL UNDER THE WORKMEN'S COMPENSATION ACT.

IN the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 13th inst., judgment was delivered in the case of Barrett *v.* Kemp Bros., on the defendants' appeal from an award made by the Judge of the Sittingbourne County Court under the Workmen's Compensation Act, 1897.

In this case the plaintiff was a workman in the employment of the defendants, a firm of builders and contractors, who leased and occupied a wharf on the river Medway, used for the purpose of loading and unloading materials used by the defendants in their business. There was no machinery or plant on the wharf, and anyone was allowed to use the wharf on payment of wharfage. Leading from the public highway to the wharf was a private road, about 250 yds. long and about 11 ft. or 12 ft. wide, the defendants being the lessees and occupiers of this private road. This road was separated from the highway by a gate, which was kept locked when the road was not being used by the defendants and their servants, the defendants keeping the key. The defendants' name was on the gate, and the road and the wharf were bounded on both sides by a hedge, except on the frontage to the river and at the junction with the road. The plaintiff was employed on the private road breaking stones for the purpose of repairing the road, and when at work about 40 yds. from the gate he was struck in one of his eyes by a piece of stone, and he lost the sight of it. It appeared that the plaintiff had never been employed on the wharf itself. The County Court Judge held that the employment on the road leading to the wharf was employment on or about the wharf, and that the wharf was a "factory" within the meaning of section 7 of the Act, and he made an award in the plaintiff's favour. Hence the present appeal of the defendants, on whose behalf it was contended that the wharf was not a "factory" within the meaning of the section. It was admitted that if the wharf was a "factory" the defendants were the "undertakers" in respect thereof.

In the result, their Lordships, without calling upon counsel for the plaintiff, held that the wharf was a "factory" within the meaning of the section, and that the accident happened on a road within the curtilage of the factory.

The appeal was accordingly dismissed, with costs.

Mr. G. A. Scott appeared for the appellants, and Mr. Cecil Walsh for the respondent.

LONDON BUILDING ACT.

AT the South-Western Police-court on the 14th inst., Mr. J. Gibbs, builder, of 31, Upper Richmond-road, Wandsworth, was summoned by Mr. Lawton Ford, District Surveyor, for erecting a public building at the Wandsworth Convent, West Hill, without having given a complete and proper notice, the incompleteness consisting in omitting to deposit plans and sections as required by the by-laws made by the London County Council. It appeared that the District Surveyor had made repeated applications to the defendant to deposit the drawings, but, they having been submitted, the defendant declined to do more.

Mr. Francis, the magistrate, said that the law appeared to be quite clear, and imposed a fine of 40*s.* and costs.

CAPITAL AND LABOUR.

EMPLOYMENT IN DECEMBER.—According to returns furnished by 84 Employers' Associations whose members are estimated to employ about 100,000 workpeople, and by Trade Unions with an aggregate membership of about 185,000, employment with all branches but masons is bad, and rather worse than a month ago and a year ago. With masons employment is quiet on the whole, and shows no great change as compared with a month or a year ago. The returns from Employers' Associations show that employment was good with 4.0 per cent. of the workpeople reported on, fair or moderate with 18.4 per cent., and dull or bad with 77.6 per cent. The corresponding percentages were, a month ago, 11.0, 17.6, 71.4; and a year ago, 5.0, 23.0, and 72.0. Employment with bricklayers is reported as dull generally, and rather worse than a year ago. With masons it is fair in England and moderate in Scotland. With carpenters and joiners, painters and plasterers, it is dull generally. The percentage of unemployed Trade Union carpenters and joiners at the end of December last was 7.9, compared with 6.1 at the end of November, and 5.9 at the end of December, 1902. Employment with plumbers continues dull generally. The percentage of unemployed members among Trade Union plumbers at the end of December was 7.7, as against 7.2 in November, and 5.6 in December, 1902. Slaters and tilers report employment as quiet, slightly worse than a month ago, and worse than a year ago. Some distress continues to be reported among builders' labourers in certain districts.—*Labour Gazette.*

TERMS OF SUBSCRIPTION.

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SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 6.—By T. WOODS (at Hounslow).

Hounslow Heath, Middlesex.—8 to 15, Gloucester-ter., u.t. 88½ yrs., g.r. 37*l.* 10*s.*, e.r. 135*l.* 4*s.*	£400
Heston, Middlesex.—North Hyde-la., freehold residence and cottage adjoining, q.r. 30*l.*...	715
Twickenham.—52, Church-st., f., e.r. 30*l.*.....	450

By H. D. TILLY & Co. (at Maidenhead).

Maidenhead, Berks.—St. Mark's-rd., "Littlecot," f., q.r. 19*l.* 10*s.*	370

January 12.—By NOYS & HOWES.

Forest Hill.—151, 157, and 159, Woolstone-rd., u.t. 93 yrs, g.r. 21*l.*, y.r. 95*l.*.....	770

By H. J. WAY & SON (at Newport).

Godshill, Isle of Wight.—"Park Wall Farm," 20 a. 2 r. 11 p., f.	1,475
"Allen's House" and 2½ a., f., p.....	400
"Eight Acres" Field, 8 a. 1r. 32 p., f.	475
Steephill-rd., "Nessclife," u.t. 964 yrs., g.r., 11*l.*, p.....	460

By ANDREWS & HITCH (at Chelsea).

Chelsea.—12, 13, 14, 18, 24 and 25, Trafalgar-sq., u.t. 5 yrs., g.r. 36*l.*, e.r. 351*l.*.....	780
Trafalgar-sq., two builders' yards, timber yard, saw mills, workshops, &c., u.t. 5 yrs., g.r. nil, y.r. 326*l.* 5*s.*	1,275
Manresa-rd., 1 to 8, and 8a, Wentworth Studios, also "Wentworth Villa," u.t 5 yrs., g.r. nil, y.r. 415*l.*	795
Arthur-st., l.g.r. 146*l.* 8*s.*, u.t. 5 yrs., g.r. nil	910
25, Oakley-cres., y.r. 48*l.*, also l.g.r. 6*l.*, u.t. 49½ yrs., g.r. 12*l.*	570
78, Manor-st. ("Safety Lamp Coffee Palace"), u.t. 49½ yrs., g.r. 6*l.*, y.r. 40*l.*.....	690
41, Fernshaw-rd., u.t. 60½ yrs., g.r. 2*l.* 10*s.*, y.r. 42*l.*	490
Battersea.—1, Kassala-rd., u.t. 71½ yrs., g.r. 7*l.*, e.r. 35*l.*	420

January 13.—HIND & SONS.

St. George's East.—25 to 43 (odd), Grove-st., f., w.r. 287*l.* 6*s.*	4,005
19, 21, and 23, John-st., f., w.r. 100*l.* 2*s.*....	1,270
26, 28, and 30, John-st., f., w.r. 44*l.* 4*s.*	1,075
Mile End.—75 and 77, Bridge-st., f., w.r. 62*l.* 8*s.*	750
Hackney.—48, Eleanor-rd., u.t. 53 yrs., g.r. 6*l.* 10*s.*, q.r. 45*l.*.....	380

By F. VARLEY & SON.

Bowes Park.—156, Whittington-rd., u.t. 76 yrs., g.r., 6*l.* 10*s.*, y.r. 28*l.*.....	240

January 14.—DAVID J. CHATTELL.

Hammersmith.—Raynham-rd., f.g.r. 1d., reversion in 65½ yrs.	120
Studland-st., f.g. rents 10*s.* 7*d.*, reversion in 64 yrs.....	190
Dunton Green, Kent.—"Morant's Cottage," and 2 a. 0 r. 13 p., f., p.	760

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, JANUARY 22.

Architectural Association.—Paper by Mr. Maurice B. Adams, entitled: "As to the Making of Architects, with Examples of Draughtsmanship." 7.30 p.m.

The Junior Institution of Engineers (Westminster Palace Hotel).—Mr. J. Fletcher Moulton, K.C., M.P., F.R.S., will deliver his presidential address. 8 p.m.

Royal Institution.—The Rev. W. Sidgreaves on "Spectroscopic Studies of Astrophysical Problems at Stonyhurst College Observatory." 9 p.m.

SATURDAY, JANUARY 23.

Architectural Association.—First Spring Visit, to the offices of the Royal London Friendly Society, Finsbury-circus, by permission of the architect, Mr. John Belcher, A.R.A. 2.30 p.m.

Builders' Foremen's Association.—10th Annual Dinner, Throne-room, Holborn Restaurant. 6.30 p.m.

MONDAY, JANUARY 25.

Surveyors' Institution.—Mr. Ralph Nevill, K.C., on "The Garden City Scheme and First Garden City, Limited." 8 p.m.

Incorporated Institute of British Decorators (London District, Painters' Hall, Little Trinity-lane, E.C.).—Mr. G. H. Morton (of Liverpool) on "The Primary Colours," to be followed by a Discussion. 8.30 p.m.

Builders' Benevolent Institution.—Committee Meeting 5 p.m.

Glasgow Philosophical Society (Architectural Section).—Mr. Peter Fyfe, Chief Sanitary Inspector of Glasgow, on "Some City Pollutions," illustrated. 8 p.m.

TUESDAY, JANUARY 26.

London Master Builders' Association.—Dinner, Alexandra Hall, Trocadero Restaurant, Piccadilly-circus, W. 6.30 p.m.

Institution of Civil Engineers.—Mr. A. E. Carey on "The Sanding-up of Tidal Harbours." 8 p.m.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Mr W. H. Maxwell on "Scavenging and Disposal of Refuse." 7 p.m.

National Federation of Building Trade Employers.—Council Meeting.

WEDNESDAY, JANUARY 27.

Architectural Association (Discussion Section).—Paper by Mr. T. H. Russell, M.A., on "The Ventilation of Chemical Laboratories." 7.30 p.m.

St. Paul's Ecclesiological Society.—The Rev. H. Bedford Pim on "Low-side Windows and other Objects of Interest in Churches," illustrated by lime-light lantern views. 8 p.m.

Northern Architectural Association.—Mr. R. P. S. Twizell on "The Origin of Gothic Architecture," illustrated with lime-light views. 7.30 p.m.

Edinburgh Architectural Association.—Mr. J. Maurice Arthur on "Some Interesting and Necessary Legal Points in Building." 8 p.m.

National Federation of Building Trade Employers.—Half-Yearly General Meeting.

THURSDAY, JANUARY 28.

London Institution.—Mr. H. T. Ashby on "A Pilgrimage to Classic Shrines in Greece, Asia Minor, and Crete," illustrated. 6 p.m.

Institution of Electrical Engineers.—(1) Adjourned discussion, to be opened by Dr. J. A. Fleming, F.R.S., vice-president, on Mr. W. Hibbert's paper on "The Edison Accumulator for Automobiles." (2) Adjourned discussion on Dr. Hans Behn-Eschenburg's paper on "The Magnetic Dispersion in Induction Motors, and its Influence on the Design of these Machines." 8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. J. A. Gotch, F.S.A., on "The Homes of Queen Elizabeth." 6.30 p.m.

FRIDAY, JANUARY 29.

Royal Institution.—Mr. D. G. Hogarth, M.A., on "The Marshes of the Nile Delta." 9 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. A. P. Head on "Metallurgy as Applied in Engineering." 8 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. W. G. Peddle on "Comparison of Building Practices in Scotland." 8 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks.....	1	16	0	per 1000 alongside, in river.		
Rough Stocks and Grizzles.....	1	13	0	,,	,,	,,
Facing Stocks ...	2	12	0	,,	,,	,,
Shippers	2	10	0	,,	,,	,,
Flettons	1	10	0	,,	at railway dep	t.
Red wire Cuts ..	1	13	0	,,	,,	,,
Best Fareham Red	3	12	0	,,	,,	,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,,	,,
Best Blue Pressed Staffordshire ..	4	4	0	,,	,,	,,
Do. Bullnose	4	10	0	,,	,,	,,
Best Stourbridge Fire Bricks....	4	8	0	,,	,,	,,
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	13	0	0	,,	,,	,,
Headers	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	17	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers..	16	0	0	,,	,,	,,
One Side and two Ends	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamfered, Squints .	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers..	14	0	0	,,	,,	,,
One Side and two Ends	15	0	0	,,	,,	,,
Two Sides and one End	15	0	0	,,	,,	,,
Splays, Chamfered, Squints..	14	0	0	,,	,,	,,
Second Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.	

	s.	d.	
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	,, ,,

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BRICKS, &c.—(*continued*)—

	s.	d.		
Best Portland Cement	29	0	per ton,	delivered.
Best Ground Blue Lias Lime	20	6	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fire Clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s.	d.		
BATH STONE—delivered on road waggons, Paddington depôt	1	6½	per ft.	cube.
Do. do. delivered on road waggons, Nine Elms depôt	1	8½	,,	,,
PORTLAND STONE (20 ft. average)—				
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	1	,,	,,
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	2½	,,	,,

	s.	d.			
Ancaster in blocks	1	11	per ft.	cube, deld. rly. depôt.	
Beer in blocks	1	6	,,	,,	
Greenshill ,,	1	10	,,	,,	
Darley Dale in blocks	2	4	,,	,,	
Red Corschill ,,	2	5	,,	,,	
Closeburn Red Freestone	2	0	,,	,,	
Red Mansfield ,,	2	4	,,	,,	

YORK STONE—*Robin Hood Quality.*

	s.	d.		
Scappled random blocks	2	10	per ft.	cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per foot	super. ,,
6 in. rubbed two sides ditto, ditto	2	6	,,	,,
3 in. sawn two sides slabs (random sizes)	0	11½	,,	,,
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	,,	,,
1½ in. to 2 in. ditto, ditto	0	6	,,	,,
HARD YORK—				
Scappled random blocks	3	0	per ft.	cube ,,
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft.	super. ,,
6 in. rubbed two sides Ditto	3	0	,,	,,
3 in. sawn two sides slabs (random sizes)	1	2	,,	,,
2 in. self-faced random flags	0	5	,,	,,

Hopton Wood (Hard Bed) in blocks 2 3 per ft. cube. deld. rly. depôt.
,, 6 in. sawn both sides landings 2 7 per ft. super. deld. rly. depot.
,, 3 in. do. 1 2½ ,, ,,

SLATES.

in.	in.	£	s.	d.		
20	10 best blue Bangor	13	2	6	per 1000 of 1200 at r. d.	
20	12 ,, ,,	13	17	6	,,	,,
20	10 best seconds ,,	12	15	0	,,	,,
20	12 ,, ,, ,,	13	10	0	,,	,,
16	8 best ,, ,,	7	0	0	,,	
20	10 best blue Portmadoc	12	12	6	,,	,,
16	8 best blue Portmadoc	6	12	6	,,	,,
20	10 best Eureka unfading green	15	2	6	,,	,,
20	12 best Eureka unfading green	17	2	6	,,	,,
18	10 ,, ,,	12	10	0	,,	,,
16	8 ,, ,,	10	5	0	,,	,,
20	10 permanent green	11	10	0	,,	,,
18	10 ,, ,,	9	10	0	,,	,,
16	8 ,, ,,	6	10	0	,,	,,

TILES.

	s.	d.		
Best plain red roofing tiles	42	0	per 1000 at	rly. depot.
Hip and Valley tiles	3	7	per doz.	,, ,,
Best Broseley tiles	50	0	per 1000	,, ,,
Do. Ornamental tiles	52	6	,,	,, ,,
Hip and Valley tiles	4	0	per doz.	,, ,,
Best Ruabon red, brown or brindled do. (Edwards)	57	6	per 1000	,, ,,
Do. Ornamental do.	60	0	,,	,, ,,
Hip tiles	4	0	per doz.	,, ,,
Valley tiles	3	0	,,	,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000	,, ,,
Do. Ornamental do.	54	6	,,	,, ,,
Hip tiles	4	1	per doz.	,, ,,
Valley tiles	3	8	,,	,, ,,
Best "Rosemary" brand plain tiles	48	0	per 1000	,, ,,
Best Ornamental tiles	50	0	,,	,, ,,
Hip tiles	4	0	per doz.	,, ,,
Valley tiles	3	8	,,	,, ,,

WOOD. At per standard.

	£	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15	10	0	16	10	0
Deals: best 3 by 9	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0	12	10	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less thn best		
Battens: seconds	0	10	0	,,	,,	
2 in. by 4 in. and 2 in by 6 in.	9	0	0	9	10	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0
Foreign Sawn Boards—						
1 in. and 1½ in. by 7 in.	0	10	0	more than battens.		
½ in.	1	0	0	,,		
Fir timber: best middling Danzig or Memel (average specification)	At	per	load	of 50	ft.	
	4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft. average)	3	5	0	3	15	0
JOINERS' WOOD.						
White Sea: first yellow deals,	At	per	standard.			
3 in. by 11 in.	23	0	0	24	0	0
3 in. by 9 in.	21	0	0	22	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	18	10	0

WOOD—(*continued*)—

	At per standard. £	s.	d.	£	s.	d.
JOINERS' WOOD.—(*Contd.*)						
Second yellow deals, 3 in. by 11 in.	18	10	0	20	0	0
,, 3 in by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	15	10	0	16	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Petersburg: second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	10	0	14	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg:—						
First white deals, 3 in. by 11 in.	14	10	0	15	10	0
,, 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
,, 3 in. by 9 in.	12	10	0	13	10	0
,, battens	9	10	0	10	10	0
Pitch-pine: deals	16	0	0	18	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	33	0	0	upwards.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine oddments, per ft. cube	20	0	0	22	0	0
Kauri Pine—Planks, per ft. cube	0	3	6	0	4	6
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	2	6	0	3	6
Small ,, ,,	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	7	0	0	8
½ in. do. do.	0	0	6½		—	
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	21	0	0
American Whitewood Planks— per ft. cube	0	4	0		—	
Prepared Flooring—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1½ in. by 7 in. yellow, planed and matched	0	16	0	1	1	6
1 in. by 7 in. white, planed and shot	0	11	6	0	1	6
1 in. by 7 in. white, planed and matched	0	12	0	0	14	0
1½ in. by 7 in. white, planed and matched	0	14	6	0	16	6
½ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
½ in. by 7 in. do. do. do.	0	14	0	0	18	0
1 in. by 7 in. white do. do.	0	10	0	0	11	6
1 in. by 7 in. do. do. do.	0	11	6	0	13	6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	6	5	0	7	5	0
Compound Girders, ordinary sections	8	2	6	9	5	0
Angles, Tees and Channels, ordinary sections	7	17	6	8	17	6
Flitch Plates	8	5	0	8	15	0
Cast Iron Columns and Stanchions including ordinary patterns	7	2	6	8	5	6

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON—						
Common Bars	7	10	0	8	0	0
Staffordshire Crown Bars, good merchant quality	8	0	0	8	10	0
Staffordshire "Marked Bars"	10	10	0		—	
Mild Steel Bars	8	15	0	9	5	0
Hoop Iron, basis price	9	5	0	9	10	0
,, galvanised	17	10	0		—	

(*And upwards, according to size and gauge.)

Sheet Iron (Black)—						
Ordinary sizes to 20 g.	9	15	0		—	
,, ,, 24 g.	10	15	0		—	
,, ,, 26 g.	12	5	0		—	
Sheet Iron, Galvanised, flat, ordinary quality—						
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12	15	0		—	
Ordinary sizes to 22 g. and 24 g	13	5	0		—	
,, ,, 26 g.	14	5	0		—	
Sheet Iron, Galvanised, flat, best quality—						
Ordinary sizes to 20 g.	16	0	0		—	
,, ,, 22 g. and 24 g.	16	10	0		—	
,, ,, 26 g.	18	0	0		—	
Galvanised Corrugated Sheets—						
Ordinary sizes, 6 ft. to 8 ft. 20 g	12	15	0		—	
,, ,, 22 g. and 24 g.	13	5	0		—	
,, ,, 26 g.	14	0	0		—	
Best Soft Steel Sheets, 6ft. by 2ft. to 3 ft. by 20 g. and thicker	11	15	0		—	
Best Soft Steel Sheets, 22 g. & 24 g	12	15	0		—	
,, ,, 26 g	14	0	0		—	
Cut nails, 3 in. to 6 in.	9	5	0	9	15	0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3lb. and up	14	2	6		—	
Pipe in coils	14	12	6		—	
Soil pipe	17	2	6		—	
Compo pipe	17	2	6		—	
ZINC—Sheet—						
Vieille Montagne ..... ton	26	5	0		—	
Silesian	26	0	0		—	

LEAD, &c.—(*continued*)—

	Per ton, in London. £	s.	d.	£	s.	d.
COPPER—						
Strong Sheet ..... per lb.	0	0	10½		—	
Thin ,,	0	0	11½		—	
Copper nails ,,	0	0	11		—	
BRASS—						
Strong Sheet ..... per lb.	0	0	10		—	
Thin ,, ,,	0	0	11		—	
TIN—English Ingots ,,	0	1	4		—	
SOLDER—Plumbers' ,,	0	0	6½		—	
Tinmen's ,,	0	0	8		—	
Plowpipe ,,	0	0	9		—	

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d.	per ft.	delivered.
,, fourths	1½d.	,,	,,
21 oz. thirds	3d.	,,	,,
,, fourths	2½d.	,,	,,
26 oz. thirds	3½d.	,,	,,
,, fourths	3d.	,,	,,
32 oz. thirds	4½d.	,,	,,
,, fourths	4d.	,,	,,
Fluted sheet, 15 oz.	2½d.	,,	,,
,, 21 oz.	3½d.	,,	,,
¼ Hartley's Rolled Plate	1½d.	,,	,,
⅜ ,, ,, ,,	2d.	,,	,,
½ ,, ,, ,,	2½d.	,,	,,

OILS, &c.

	£	s.	d.
Raw Linseed Oil in pipes or barrels ..per gallon	0	1	8
,, ,, ,, in drums ,,	0	1	11
Boiled ,, ,, in pipes or barrels ,,	0	1	11
,, ,, ,, in drums ,,	0	2	2
Turpentine, in barrels ,,	0	3	8
,, in drums ,,	0	3	10
Genuine Ground English White Lead per ton	19	0	0
Red Lead, Dry ,,	19	0	0
Best Linseed Oil Putty per cwt.	0	7	6
Stockholm Tar per barrel	1	12	0

VARNISHES, &c. Per gallon.

	£	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERDEEN.—For construction of a timber wharf, about 750 ft. long, and other work on the River Dee, for the Aberdeen Harbour Commissioners. Mr. R. Gordon Nicol, Engineer, Harbour Engineer's Office, Aberdeen:—

London and Tilbury Lighterage, Contracting, and Dredging Co., Ltd., 50, Mark-lane, London, E.C.*	£20,229 1 1

BINGLEY.—For sewering, paving, kerbing, flagging, of Whitley-street for the Urban District Council. Mr H. Bottomley, surveyor, Town Hall, Bingley:—

R. Naylor & Son	£711 14 3
D. Wildman	691 0 0
Midgley & Butterfield	665 5 6
Ross & Crabtree	657 17 0
W. Baker, Keighley*	626 12 1

(*Continued on page* 93.)

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Designs for New School	Govs. of N'c'tle-on-Tyne R.G.S.	100*l.*, 50*l.*, 25*l.*	April 30
Hospital, Greenock	Hos. Board, Town Clerk, Greenock	Not stated	Feb. 2
Houses for Working Classes	Bangor City Council	20 Guineas	Feb. 20
*Design for Reconstruction of Meat Market	Haverfordwest Town Council	20 Guineas	No Date

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Hospital Furniture, Menstone	Wharfedale Hospital Committee	C. V. Newstead, Clerk, Union Offices, Otley	Jan. 23
Dormitories, Dining Hall, etc., Reed's Gmr. Schl, Drax	.....	E. and T. Clark, Clerks to Governors, Snaith	do.
Pulling Down and Re-buildg Post Office, etc., Bramley	.....	Kay & Long, Architects, 10, St. Paul's-street, Leeds	do.
Alterations, etc., Wheat Sheaf Inn, Borrowby	Dover and Newsome Baxter, Ltd	J. E. Walton, Architect, Northallerton	do.
C.I. Sect. Pillars, etc., Electricity Works, Port Dundas	do.	W. A. Chaman, Engineer, 75, Waterloo-street, Glasgow	Jan. 25
Removal of Night Soil, etc.	Birkenhead Corporation	Chief Inspector of Nuisances, Town Hall, Birkenhead	do.
Retort House, Coal Stores, etc., at Gasworks, East-st.	Farnham Gas Company	Gas Company Offices, Gas Works, Farnham	do.
Scavenging, Middleton-St. George	Darlington R.D.C.	J. Robinson, Union Offices, Darlington	do.
Residence, Surgery, Coachhouse, etc., East-street	Dr. B. G. Heald	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Electric Light, etc., Kingston Dist. Library, Paisley-rd	Glasgow Corporation	City Engineer, City-chambers, Glasgow	do.
Excavating Site, etc., Classrooms, Barnard's Cross	Salisbury Diocesan Training Coll	J. Harding & Son, Architects, 58, High-street, Salisbury	do.
Re-construction of Tenements, Greenside Row	City of Edinburgh	Burgh Engineer, City-chambers, Edinburgh	do.
Tram Lines, Pits, etc.	Aston Manor Corporation	R. Green, A.M.Inst.C.E., 37, Waterloo-street, Birmingham	do.
Alterations to Tramway Depot, Witton Lane	do.	do.	do.
Church and Halls, Queen-street, Aberdeen	.....	W. E. Gauld, Architect, 258, Union-street, Aberdeen	do.
Draining, etc., Harpurhey	Manchester Corporation	Paving Department, Surveyor's Office, Town Hall, Manchester	do.
Draining, etc., Crumpsall	do.	do.	do.
Alterations, etc., to Business Premises, Pwllheli, Wales	D. Lloyd Jones	D. Lloyd Jones, High-street, Pwllheli, Wales	do.
Street Works (Joseph-street, etc.)	Derby Corporation	J. Ward, Borough Surveyor, Babington Lane, Derby	do.
Feeding, etc, Mains	Whitby U.D.C. (Electricity Dept.)	L. H. King, Electrical Engineer to the Council, Whitby	do.
Caretaker's House, Heworth	Felling Education Committee	H. Miller, Architect, Council Buildings, Felling	do.
Two Dwelling Houses, Leeds-road, Bradley	.....	J. H. Hall, Architect, Fartown, Yorks	Jan. 26
Shower Bath and Alterations at Gym., Palmyra-sq	Warrington Gymnasium Com.	Borough Surveyor, Town Hall, Warrington	do.
Hospital, Scalford-road, Melton Mowbray	Melton and Belvoir Hospl. Com.	E. Jeeves, Architect, Nottingham-street, Melton Mowbray	do.
Works in Rimrose-road, Park-street, etc., Bootle	The Corporation	Borough Engineers' Office, Bootle	do.
Making-up Lancaster-avenue, Liscard	Wallasey U.D.C.	District Engineer to Council, Public Offices, Egremont	do.
" Briardale-road, Seacombe	do.	do.	do.
" Passage, Albermarle-road, Seacombe	do.	do.	do.
" " May-avenue, etc., Seacombe	do.	do.	do.
" " Stringhey-road, etc., Egremont	do.	do.	do.
" " Norman-road, etc., Seacombe	do.	do.	do.
" " St. Paul's-road, Seacombe	do.	do.	do.
" " Green-lane, Wallasey	do.	do.	do.
" " Wallasey Village (the Poplars)	do.	do.	do.
Wooden Troughing for Cables	Glasgow Corporation	W. A. Chamden, Engineer, 25, Waterloo-street, Glasgow	do.
*Enlargement of Sorting Office, Upper Holloway	Commiss. of H.M. Works, etc.	H.M. Office of Works, Storey's Gate, S.W.	do.
Marble Statue of the Virgin Mary, Ch'p'l of Wrkhse	Rathdown Guardians	P. Cunniam, Clerk to Union, Loughlinstown, Dublin	Jan. 27
Seven Through Houses, Wakefield-road, Earlsheaton	.....	Bank Top, Earlsheaton, Yorks	do.
Bank Office, Banbridge, co. Down	Ulster Bank, Ltd.	W. H. Stephens & Sons, Donegall-square North, Belfast	do.
Steel Casings for Lime Kilns, Provan Gasworks	Glasgow Corporation	A. Wilson, Engineer, 45, John-street, Glasgow	do.
Semi-detached Villas, Headingley	.....	J. Charles & Sons, 98, Albion-street, Leeds	do.
Inspector's House and Four Cottages, Church Fenton	N.E. Railway Company	W. Bell, Architect to the Company, York	do.
Improvements to Cottages, Church Fenton	do.	do.	do.
Meat Store, etc., Enfield Workhouse	Guardians of Edmonton Union	T. E. Knightley, Architect, 106, Cannon-street, E.C.	do.
Sluice Valves, etc., Talla Waterworks	Edinburgh Water Trustees	W. A. Tait, C.E., 72a, George-street, Edinburgh	do.
350-Gallon Water Van	Branksome U.D.C.	S. J. Newman, Surv., Council Bldgs., Branksome, Parkstone, R.S.O.	do.
Steel Casings for Lime Kilns, etc.	Glasgow Corporation	A. Wilson, Engineer, 45, John-street, Glasgow	do.
*Granite Kerb	Hove Corporation	Borough Surveyor, Town Hall, Hove	do.
Sewers, etc.	Wokingham Town Council	C. W. Marks, Borough Engineer, Town Hall, Wokingham	Jan. 28
Additions, Elland Grammar School	.....	F. F. Beaumont, Architect, Southgate Chambers, Halifax	do.
Synagogue, Annesley-street, Belfast	.....	S. C. Hunter, Building Surveyor, Belfast	do.
Post Office, Belturbet, co. Cavan	.....	Office of Public Works, Dublin	do.
Cooking Appliances, Workhouse, Merthyr Tydfil	Merthyr Tydfil Guardians	T. Roderick, Architect, Aberdare	do.
Marton Beck Valley Sewer	Middlesbrough Corporation	F. Baker, Borough Engineer, Middlesbrough,	Jan. 29
Draining, etc., Withington-road, Whalley Range	Withington U.D.C.	A. H. Mountain, Surveyor to Council, Town Hall, West Didsbury	do.
Drainage, etc., Works Tolworth Joint Hospital	Joint Hospital Board	Carter & Ashworth, Architects, 86, Eden-st., Kingston-on-Thames	Jan. 30
Two Houses, Norfolk-square, Great Yarmouth	F. Allen	C. G. Baker, Architect, Town Hall Chambers, Great Yarmouth	do.
Fire Engine House Works, Carrickfergus, Ireland	Carrickfergus U.D.C.	J. Boyd, Clerk, Town Hall, Carrickfergus	do.
Market Sheds, Carrickfergus, Ireland	do.	do.	do.
Dwelling House, Newport, Pembrokeshire	.....	W. Davies, The Cross House, Newport, Pembrokeshire	do.
Timber Safety Fencing, Badenoch District	.....	A. Mackenzie, C.E., Surveyor, Kingussie	do.
Wesleyan Meth. Ch., Connor Down, Hayle, Cornwall	.....	O. Caldwell, F.R.I.B.A., Penzance	do.
Forty-Four School Cupboards	Newcastle-on-Tyne Educa. Com.	Education Offices, Northumberland-road, Newcastle-on-Tyne	Jan. 31
Promenade Extension and Lavatories	Redcar U.D.C.	J. Howcroft, Surveyor, Council Offices, 2, West-terrace, Redcar	do.
Promenade Extension	do.	do.	do.
Lavatories	do.	do.	do.
Band Stand	do.	do.	do.
Boundary Wall, 54, Radnor-street, London	Kingshill Co-operative Society	Society's Offices, 54, Radnor-street, London	Feb. 1
Sixteen Artisan Dwellings, Mallow, Ireland	Mallow U.D.C.	Brian E. F. Sheehy, Architect, 57, George-street, Limerick	do.
Coal Store, etc., Chesterfield-road Pumping Station	Mansfield Corporation	G. & F. W. Hodson, Engineers, Loughborough	do.
Fire Station, Buttway-lane	Cliffe (Kent) Parish Council	F. E. Rogers, Clerk, Parish Council Offices, Cliffe	do.
Additions, etc., House at Shanakiel, Cork	.....	W. H. Hill & Son, Architects, 28, South-mall, Cork	do.
Stores, Borough Engineer's Department	Southampton Corporation	J. A. Crowther, Borough Engineer, Southampton	do.
Pulling Down 35, Mary-le-Port-st., & Erecting Wareh.	Messrs. Lindrea & Co.	H. J. Jones & Son, Architects, 12, Bridge-street, Bristol	do.
Materials	Grimsby Corporation	H. G. Whyatt, Borough Engineer, Town Hall, Grimsby	do.
Files, Rasps, and Rubbers	Army Ordnance Department	H. de la Bere, War Office, Pall Mall, London, S.W.	do.
Library, Whitchurch, near Cardiff	.....	R. & S. Williams, Architects, Boro'-chambers, Wharton-st., Cardiff	do.
Wharf, Cattewater Harbour, etc.	Plymouth Corporation	Sir J. Wolfe Barry, Engineer, 21, Delahay-street, London, S.W.	do.
Covered Play Grounds, etc.	Trevesham School Board	Lansdowne & Griggs, Architects, Newport, Mon.	do.
Warehouses, Nelson-street	Glasgow Corporation	Thomson & Sandelands, Archts., 241, West George-st., Glasgow	do.
*Power House, etc., Technical Inst., Paddington	L.C.C.	Arch. Dept. (General Construction Section), 15, Pall Mall East, S.W.	do.
*Isolation Hospital	Hitchin Joint Hospital Board	See Advt. in this issue	do.
High School for Girls, Yarm-road, Stockton-on-Tees	Governors, Q. Victoria High School	C. J. Archer, Clerk to Governors, 77, High-st., Stockton-on-Tees	Feb. 2
Oil Engine and Pump at Stonerig Filters, Armadale	Bathgate Com., Linlithgow Cy. Cl.	W. A. Tait, C.E., 72A, George-street, Edinburgh	do.
Cutting Tracks and Laying C.C. Pipes, Stonerig Filters	.....	do.	do.
Underground Lavatory Works	Herne Bay U.D.C.	F. W. J. Palmer, Surveyor to Council, Herne Bay	do.
Salesman's Office, St. George's-terrace	Canterbury Markets Committee	A. C. Turley, City Surveyor, Guildhall-street, Canterbury	do.
Kingston-lane Improvement	Teddington U.D.C.	M. Hainsworth, Surveyor, Teddington	do.
*Roadmaking Works	Chingford U.D.C.	Council's Surveyor, 14, The Parade, Chingford	do.
Restoration of Cranwell Church, Sleaford	.....	G. R. Boreham, 24, John-street, Sunderland	Feb. 3
5-ton double-barrelled loco. Steam Crane	Warrington Gas Committee	W. S. Haddock, Engineer, Gas Offices, Warrington	do.
Pipe Sewers	Dorking R.D.C.	W. Rapley, jun., Surveyor, Clovelly, Tower Hill, Dorking	do.
Sewage Disposal Wks., Pumping Sta., etc., Westcott.	do.	do.	do.
Retort Stoking Machinery, etc., Liverpool Works	Gas Committee, Salford Corp.	W. W. Woodward, Engineer, Gas Offices, Bloom-street, Salford	Feb. 4
*Erection of Stabling and Disinfecting Station	Boro' of Bethnal Green	Town Clerk, Town Hall, Church-row, Bethnal Green	do.
Wesleyan Sunday School, King's Cross, Halifax	Trustees	A. G. Dalzell, Architect, 15, Commercial-street, Halifax	Feb. 5
757 Desks and 60 other articles, Hyde Park Schools	Plymouth Education Authority	E. Chandler Cook, 18, Princess Square, Plymouth	Feb. 6
Stores for Engineer's Department	Wallasey U.D.C. Health Com'ittee	W. H. Travers, Dist. Engineer, Pub. Offices, Egremont, Cheshire.	do.
Stores	Works Com'ittee, Wallasey U.D.C.	do.	do.
Rebuilding Stone Bridge, Embleton South Farm	Alnwick R.D.C.	H. W. Walton, Clerk, Alnwick	Feb. 8
Longdene-road Works, Haslemere	Hambledon R.D.C.	F. Smallpiece, Clerk, 138, High-street, Guilford	do.
Alterations and Additions to Workhouse	Hailsham Union	Mitchell & Ford, Architects, 7, Gildredge-road, Eastbourne	Feb. 9
*Supplies, etc.	West Ham Council	Borough Engineer, Town Hall, Stratford, E.	Feb. 11
*New Coastguard Station, etc., St. Leonards	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.	Feb. 12
Single Line Railway, Dunfermline to Kincardine	North British Railway Company	Blyth & Westland, Engineers, 135, George-street, Edinburgh	Feb. 15

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Broken Granite	Essex County Council	P. J. Sheldon, Chief Surveyor, Chelmsford	Feb. 15
Caisson for Royal Edward Dock, Avonmouth	Bristol Docks Committee	W. W. Squire, Engineer, Cumberland-road, Bristol	do.
3 pairs of Lock Gates for Entrance Lock, Avonmouth	do.	do.	do.
An Opening Bridge, Royal Edward Dock, Avonmouth	do.	do.	do.
*Supply of Broken Granite	Essex County Council	Chief Surveyor, Chelmsford	do.
*Erection of Public Baths	Chiswick U.D.C.	Council's Surveyor, Town Hall, Chiswick	Feb. 17
Sludge Vessel, Dublin	Improvements Committee	Spencer Harty, M.Inst.C.E.I., City Hall, Dublin	Feb. 23
Painting, etc., 4 Wards	Derby County Asylum Com.	Mr. McWilliams, Resident Engineer at Asylum, Mickleover	Feb. 25
Police Station, Stradbroke, Suffolk	East Suffolk County Council	H. Miller, County Surveyor, 16, Museum-street, Ipswich	do.
Asylum, etc., Narborough, near Leicester	Committee of Visitors	Everard & Pick, Millstone-lane, Leicester	Feb. 27
*New Asylum, Narborough	Leicestershire, etc. Lunatic Asy.	Everard & Pick, Architects, Millstone-lane, Leicester	do.
*Municipal Offices and other Buildings	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	Mar. 1
*Erection of Epileptic Homes, &c.	Chorlton & Manchester Asyl. Com.	Giles, Gough, & Trollope, 28, Craven-street, Charing Cross, W.C.	Mar. 4
Repairs, Congregational Chapel, Old	.....	T. Ponton, Old	No date
Five-Story Shop Premises, Land's-lane, Leeds	Mr. Longley	Mosley's Rent Collectors, 5, Wormald-row, Leeds	do.
Alterations, etc., Bilton Church, Harrogate	.....	A. A. Gibson, Architect, 5, Prospect-crescent, Harrogate	do.
*Free Library in Victoria-avenue	Harrogate Corporation	H. T. Hare, Architect, 13, Hart-street, Bloomsbury, W.C.	do.
Sinking Vertical Shaft about 60 fathoms	.....	The Manager, Llanfair Mines, Ltd., near Abergele, N. Wales	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
Chief Assistant to Borough Surveyor and Engineer	Folkestone Corporation	150*l.*	Jan. 25
Mains Superintendent at Electricity Works	Wimbledon U.D.C.	125*l.*	do.
Surveyor and Inspector of Nuisances	Barnard Castle U.D.C.	120*l.*	Jan. 25
*Clerk of Works	Coventry Education Committee	4*l.* per week	do.
*Architectural Assistant	Barrow-in-Furness Corporation	120*l.*	Jan. 27
Chief Assistant Electrical Engineer	Corporation of Croydon	200*l.*	Jan. 30
Surveyor, Havering and Dagenham Levels	The Hon. Com. of Sewers, Romf'd	450*l.*	Feb. 1
Surveyor, Rainham Levels	The Hon. Com. of Sewers, Romf'd	150*l.*	do.
Engr. to make Plans, etc., for Concrete Reservoir, etc.	Maryboro'(Ireland)W't'rwks. Com.	.....	do.
Surveyor, Waterworks Engineer, Sanitary Inspector	Midsomer Norton U.D.C.	120*l.*	Feb. 4
*Clerk of Works	Leicestershire, etc., Lunatic Asy.	5*l.* 5*s.* per week	Feb. 16
*Instructor, Mechanical Engineering Department	Northampton Inst., Clerkenwell	Not stated	No date
*Clerk of Works	N. Riding Education Committee	See Advt. in this issue	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xix.

BIRKDALE.—For erecting a hospital, Birkdale, for the Urban District Council:—
T. Pickup & Co., Linaker-street, Southport £1,879 0 0

BROADSTAIRS.—For 1,030 ft. run of Norway granite edge kerb, channel, etc., for the Broadstairs and St. Peter's Urban District Council. Mr. H. Hurd, Town Surveyor, Council Offices, Broadstairs:—

Burgess & Burgess	£145 0 7
L. Sommerfeld	144 13 4
A. Brunton & Son	140 12 6
Brookes, Ltd.	137 19 7
W. Griffiths & Co.	136 1 2
Bichfeldt & Co.	131 11 3
J. Goodchild & Co.	131 4 7
A. & F. Manuelle	131 1 3
E. J. Van Praagh & Co., London*	128 19 7

CHICHESTER.—For alterations to 81 and 82, East-street, for Messrs. Halsted & Sons. Messrs. Wade & Austen, architects, East-street, Chichester. Quantities by architects:—

C. Hooker & Sons	£2,236 5 11
A. Crouch	2,147 0 0
A. Barrell, Arundel and Littlehampton†	2,119 0 0
F. Hill	2,036 0 0

COALVILLE.—For new sewers, Whitwick main drainage, for the Urban District Council. Mr. J. B. Everard, M.Inst.C.E., 6, Millstone-lane, Leicester:—

Joshua Jameson	£22,986 12 4
J. & T. Binns	21,401 0 0
F. W. Trimm	21,231 0 0
J. S. Dawson	20,986 5 2
G. M. Kerry & Co.	20,073 0 8
Simon Johnson & Son	19,935 13 9
John Holme	18,846 0 0
A. Braithwaite & Co.	18,147 6 7
Johnson & Langley	17,717 0 0
Bentley & Loch	17,692 0 0
G. F. Tomlinson	17,503 10 0
John Fletcher	17,323 6 6
Edward Orton	17,163 0 4
W. Brigg	17,105 0 0
J. Hodson & Son	16,901 11 3
W. Moss & Sons, Ltd.	16,772 10 0
Robert Wood, Bingley, Yorks*	16,054 0 0

CROSTHWAITE (Cumberland).—For the erection of Bough How Bridge, on the Keswick and Ambleside road, for the Cumberland County Council. Mr. G. J. Bell, A.M.Inst.C.E., County Surveyor, Carlisle:—

T. Telfer, Langholm, N.B.*	£744 6 9
Millward & Co.	615 9 9

This does not include the whole of the roadway.

FEATHERSTONE (Yorks.).—For the supply of kerb, flags, setts, etc., for year ending December 31, 1904, for the Urban District Council. Mr. F. B. Rothera, Surveyor. Council Offices, Featherstone:—

	Per rood.
Marshall & Co., 6 in. setts, Halifax	£2 10 6
	Per yard.
Brown, Ltd., 12 in. by 8 in. kerb, Brighouse	0 3 2
Hinden & Co., 6 in. by 15 in. kerb, Brighouse	0 2 7
Hinden & Co., 5 in. by 15 in. kerb, Brighouse	0 2 3
Scott & Granite Co., 2½ in. flags, Keswick	0 3 7
Whitaker & Smith, 3 in. Corp flags, Brighouse	0 4 0
Hinden & Co., 2 in. self-faced flags, Brighouse	0 3 4
Hinden & Co., 3 in. knotted flags, Brighouse	0 3 2
Blackfield, 2½ in. self-faced flags, Brighouse	0 2 10
Brown, Ltd., 12 in. by 8 in. kerb, Brighouse	0 4 3

HOUNSLOW.—For public offices, baths, and free library, Treaty House Estate, for the Heston and Isleworth Urban District Council. Messrs. Nowell Parr & A. E. Kates, architects, Brunswick House, Brentford. Quantities by Mr. T. J. Carless, 39, Old Queen-street, Westminster:—

	Public Offices.	Baths & Supt. Cott.	Library.	Total.
J. W. Brooking	£16,989	£13,326	£5,597	£35,912
Chamber Bros.	17,202	12,930	5,512	35,644
Chamberlain	14,954	—	4,673	—
Cowley & Drake	15,025	12,001	4,802	31,828
Cropley Bros.	16,334	12,858	5,276	34,468
F. E. Davey, Ltd.	16,557	12,137	5,093	33,787
J. Dorey & Co., Brentford	14,636*	11,090*	4,734	30,460
Ferguson & Co.	15,189	11,807	4,733	31,729
Gaze & Sons	—	—	4,767	—
Galbraith Bros.	15,738	12,400	4,841	32,979
Godson & Son	15,680	12,656	5,071	33,407
Gough & Co.	15,200	11,875	5,089	32,164
Hadley & Co.	14,781	12,508	4,902	32,191
A. & B. Hanson	14,448	11,333	4,713	30,494
F. & H. F. Higgs	16,631	13,345	5,317	35,293
Higgs & Hill	16,200	12,900	5,200	34,300
C. Gray Hill	14,500	11,600	4,700	30,800
M. Hughes	15,995	11,950	4,890	32,835
Hughes & Stirling	15,695	12,522	5,442	33,659
Leslie & Co.	15,200	12,273	4,962	32,435
Lorden & Son	15,500	12,790	5,149	33,439
Mowlem & Co.	15,798	12,970	5,008	33,776
Nightingale	15,911	12,780	4,988	33,679
Messum & Son	15,666	11,877	5,175	32,718
Patman & Fotheringham	15,041	11,923	4,800	31,764
Saunders	15,491	12,497	5,085	33,073
Shillitoe	16,000	12,500	4,950	33,450
Soole & Son	14,990	12,272	4,965	32,227
W. Wallis	15,695	12,241	5,173	33,109
Wisdom Bros., Isleworth	14,800	11,345	4,700*	30,845
Architects' estimate	15,000	10,500	5,000	30,500

HANLEY.—For three shops, Piccadilly, Hanley. Mr. Elijah Jones, architect, 10, Albion-street, Hanley:—

J. Cope	£2,002 17 8
E. Roberts	2,000 0 0
T. Chatfield & Sons	1,990 0 0
J. Cooke	1,930 0 0
A. Ward	1,865 0 0
Colley & Lindop	1,840 0 0
G. Ellis	1,760 0 0
T. Godwin	1,700 0 0
C. Cornes & Sons, Litchfield-street, Hanley*	1,600 0 0

LONDON.—For 500 tons of Guernsey granite spalls, at the Workhouse, Notting Hill, for the Kensington Board of Guardians:—

	Per ton.
A. B. Manuelle, 57, Gracechurch-street, E.C.	£0 9 11

LONDON.—For the erection of additional nurses' quarters at the South-Eastern Ambulance Station, New Cross-road, S.E., for the Managers of the Metropolitan Asylums District. Messrs. T. W. Aldwinckle & Son, architects, 20, Denman-street, S.E. Quantities by Messrs. W. H. Barber & Son, 22, Buckingham-street, Adelphi, W.C.:—

C. B. Roberts & Co.	£2,525 10 0	W. Martin	£1,673 0 0
Kirk & Randall	2,314 0 0	T. Cole	1,621 0 0
E. Proctor & Son	2,119 0 0	W. Johnson & Co., Ltd.	1,610 0 0
J. O. Richardson	2,021 0 0	T. G. Sharpington	1,598 0 0
R. H. Lowe	1,875 0 0	W. Lawrence & Son	1,594 0 0
H. Wall & Co.	1,721 0 0	W. Reason, 47, Rosebery-avenue, E.C.*	1,547 0 0
Enness Bros.	1,693 0 0		

LONDON.—For two new Lancashire boilers, etc., at the workhouse, for the Bethnal Green Board of Guardians. Mr. G. H. Hughes, M.I.M.E., 97, Queen Victoria-street, E.C. Quantities by the engineer:—

	Temporary Boilers, etc.	Two New Boilers.	Builder's Work.	For the Three Old Boilers.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Anderton & Sons	1,052 9 6	966 0 0	554 15 1	20 0 0
Adamson & Co.	—	770 0 0	—	—
Arnott & Co.	—	815 0 0	—	—
Bulford	—	—	649 0 0	—
Clayton, Son, & Co.	—	793 0 0	—	—
Danks & Co.	1,070 0 0	777 10 0	620 0 0	25 0 0
H. T. Danks, Ltd.	927 7 0	823 6 0	1,042 3 0	15 0 0
Davy Brothers, Ltd.	834 10 0	809 5 0	683 2 9	25 0 0
Foster & Sons	—	784 0 0	—	—
Fraser & Son	827 18 0	888 13 6	—	5 0 0
Fraser & Fraser, Ltd.	863 0 0	1,013 0 0	684 0 0	15 0 0
Gimson & Co., Ltd.	—	870 0 0	—	—
Greene & Co.	—	859 14 4	—	—
Goddard, Massey, & Warner	849 14 6	1,252 0 0	2,810 10 1	30 0 0
Galloways, Ltd.	757 0 0	—	—	—
Hewitt & Kellett, Bowling Ironworks, Bradford	785 0 0*	713 0 0*	698 0 0	30 0 0*
Hughes & Stirling	1,010 15 6	1,180 4 9	757 4 9	—
Hilton & Sons	—	—	874 0 0	—
Horsfield, Ltd.	—	854 19 0	—	—
Marshall & Co.	778 0 0	—	—	—
Maxim Engineering Company	1,129 19 6	—	—	—
May	798 0 0	832 0 0	724 10 0	12 0 0
Ruston, Proctor, & Co., Ltd.	896 0 0	—	—	—
Spurr, Inman, & Co., Ltd.	—	891 16 6	—	—
Shillitoe & Son	—	—	675 0 0	—
Tinkers, Ltd.	—	822 0 0	—	—
Thompson	845 5 9	768 6 0	689 14 4	25 0 0
Wellerman Bros., Hyde	—	—	568 0 0*	—
Yates & Co.	—	—	575 0 0	—

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LONDON.—For new river wall and foundations of chimney shaft at proposed power station site, Old Barge House Wharf, Blackfriars, for the Commissioner of H.M. Works and Public Buildings :—

		Credit Old Materials.
A. G. Osenton	£7,673 0 0	—
T. E. Pedrette	5,959 0 0	—
Foster & Dicksee	5,888 0 0	50
Perry & Co.	5,490 0 0	45
B. E. Nightingale	5,000 0 0	—
Stephen Kavanagh & Co.	4,743 0 0	31
F. S. Minter	4,564 0 0	—
Johnson & Co.	4,460 0 0	50
W. H. Lorden & Son	4,444 0 0	—
Montague Dinnie	4,216 11 0	—
Joseph T. Firbank, Ltd.	4,065 0 0	50
Pethick Brothers	3,987 0 0	—
Anthony Fasey & Son	3,887 2 4	—
Charles Ansell	3,838 0 0	50
Robert H. B. Neal	3,835 0 0	—
Frank Miskin	3,800 0 0	—
Case Sea Defence Syndicate, Ltd.	3,800 0 0	9
Henry Lovatt	3,763 14 3	6·10
Edward Good & Sons, Ltd.	3,752 16 2	70
J. Sangwin	3,499 14 3	20
J. Mowlem & Co., Ltd.	3,419 0 0	—
J. A. Ewart	3,140 0 0	15

MIDGEHOLME.—For the erection of a stone skew bridge across Blackburn, in Brampton district, for the Cumberland County Council. Mr. G. J. Bell, M.Inst.C.E., County Surveyor, Carlisle. Contractor takes his own quantities from plan :—

R. Little	£1,113 6 8	T. Telfer, Contractor, Langholm, N.B.*	£763 14 6
Millward & Co.	929 7 0		
T. Nixon	918 19 0		

NAAS (Ireland).—For a medical officer's residence, dispensary, and out-offices at Tully West, near Kildare, for the Guardians. Mr. Francis Bergm, B.E., 36, Westmoreland-street, Dublin. Quantities by engineer :—

James Taylor	£1,448 0 0
D. & J. Carberry, Athy*	1,320 0 0
James Kelly	800 0 0

SALTLEY.—For the erection of five pumping stations between the works at Saltley and Minworth, for the Birmingham, Tame and Rea District Drainage Board. Mr. J. D. Watson, A.M.Inst.C.E., Engineer to the Board, Tyburn, near Bromwich Station :—

H. Barnes	£1,880 0 0
Smith & Pitts	1,833 0 0
W. & J. Webb	1,800 0 0
Stafford & Mansfield	1,790 0 0
W. Sapcote & Son	1,788 0 0
H. Wilcock & Co.	1,775 0 0
J. Dallon & Sons	1,750 0 0
J. Langley	1,749 12 5
W. Hopkins	1,700 0 0
T. Johnson	1,667 0 0
E. Garfield	1,650 10 0
W. H. James, Sutton Coldfield*	1,548 0 0

SLOUGH.—For street works, Hillside, for the Urban District Council. Mr. W. W. Cooper, Surveyor to the Council, Slough :—

Johnson & Langley	£970 0 0
Lawrence & Thacker	875 0 0
Nowell & Co.	864 0 0
London and County Builders' Association	775 0 0
Free & Sons	754 0 0
J. H. R. Atkins	691 0 0
Watson, jun.	656 0 0
J. Smith, High Wycombe*	640 0 0

SOUTHAMPTON.—For erecting the new Portswood schools, etc., for the Education Committee. Mr. J. A. Crowther, Borough Engineer, 123, High-street, Southampton :—

Golding & Ansell	£18,000 0 0
S. Salter	17,518 0 0
W. Jupe	17,364 12 0
Musselwhite & Sapp	17,350 0 0
Exors. of late W. Franklin	17,280 0 0
Rashley & Son	17,187 0 0
J. Nicholl	16,379 10 0
Stevens & Co.	16,353 0 0
Playfair & Toole	15,962 0 0
Jenkins & Sons	15,874 0 0
Dyer & Son, Southampton*	15,170 0 0

SOUTHEND-ON-SEA.—For extension of car-shed at electricity works, for the Corporation. Mr. E. J. Elford, Borough Engineer, Southend.

Baker & Wiseman	£3,220 19 0
F. & E. Davey	3,175 11 10
Ernest West	2,958 0 0
J. Carter & Co.	2,944 11 10
R. Elvy	2,880 12 0
S. E. Moss & Co.	2,798 8 10
F. E. Woodhams	2,790 0 0
J. E. Flaxman, Southend*	2,647 10 2

[Borough Engineer's estimate, £2,950].

STOCKPORT. — For erection of offices for the superintendent of the sanitary depôt, Portwood, for the Cleansing Committee of the Corporation. Mr. J. Atkinson, Borough Surveyor, Stockport :—

D. Mullaney	£195 0 0	W. C. Broadhurst	£163 5 0
J. Longson	185 0 0	W. Pownall	159 4 11
S. Kitchen	176 10 0	J. Haigh	155 16 3
J. Broadhurst	175 0 0	F. & E. Foulkes	154 12 1½
R. Williamson	168 0 0	W. B. Beattie, Gradwell-st. Stockport*	140 15 0
T. Hoe	166 18 0		
J. Briggs	164 0 0		

WISBECH.—For the erection of residence, Wisbech, for Mr. J. T. Evison. Mr. G. Thorpe, architect, Post Office-lane, Wisbech. Quantities by the architect :—

W. Saint	£1,633 0 0	G. J. West	£1,475 0 0
W. H. Brown	1,597 16 0	Hipwell & Co.	1,385 0 0
R. Dye	1,578 0 0	J. W. Wilkinson*	1,250 0 0
J. R. Bateman	1,570 0 0		
H. Rands & Son	1,556 19 0		

YORK.—For the erection of an auction mart, offices, pens, and roofing at the cattle market for the Corporation. Mr. A. Creer, City Engineer, Guildhall, York :—
W. Bellerby, Hungate Saw Mills, York* £6,200 15 0

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The Builder.

VOL. LXXXVI.—No. 3182. JANUARY 30, 1904.

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The Town Hall, Frankfort ..... Herr van Hoven and Herr Neher, Joint Architects.
A Domed Church (Royal Academy Gold Medal Design):—
Perspective View } ..... By Mr. Lionel U. Grace.
Plan and Section }
Design for a Domed Church ..... By Mr. E. Vincent Harris, A.R.I.B.A.

Illustrations in Text.

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Right of Light in Paris.

IS the question of the reasonableness of the present English law as to right of light is occupying a good deal of public attention just now, it may be of some interest to describe how these matters are adjusted in Paris. The opinion has been expressed in a good many quarters that the English law as to right of light gives to the possessor of any small window of twenty years' standing a most unreasonable power of either stopping his neighbour's building or exacting from him, in lieu of prohibition, a pecuniary compensation often out of all proportion to the injury really sustained by the owner of the dominant tenement.

Those who consider that the present law of light in England is unreasonable and should be seriously modified, may find their opinion confirmed by the fact that no such tyrannical form of legislation exists in the capital of our nearest neighbouring nation. Complicated questions appear often to arise between owners of neighbouring properties in Paris, but they are not questions of common law, but only of the force and interpretation of private agreements made between the adjoining owners or their predecessors. In Paris there is no law regarding the right of light, neither has any house owner or tenant any prescriptive right to light other than that specified in article 675 of the French Civil Code, unless by reason of some private agreement come to by adjoining property holders, specifying that certain space or spaces of ground between two properties shall, for reasons of light and air or mutual convenience, for all time be considered in the light of a "servitude"—viz., shall remain free of any construction or shall not be built around for a determined distance above a certain height, so as to maintain the agreement come to between the original property owners for mutual advantages of light, air, or other convenience. Such "servitudes" are, however, entirely private agreements, and hold good as long as the conditions do not contravene the rules and regulations of property and buildings, etc., and ground possessing such "servitudes" is sold or passed over to any future possessor with full cognisance that the "servitudes" exist; and the new owner is obliged, in case of construction, reconstruction, or additions, to keep to the terms of such servitudes, unless by coming to terms with the adjoining property owner—terms of interest or of mutual convenience—he obtains a right to modify the conditions. But such agreement is entirely private, and does not in any way form any general prescriptive right; any dispute between the adjoining owners on the subject of such "servitudes" is a private one; and no other right than that agreed on mutually by themselves, or by the preceding owners whose agreement they have themselves accepted, can be brought to bear on the matter.

This arises no doubt partly from the fact that all building ground in Paris is freehold, and the building owner is always in principle the ground owner; each one has, therefore, the right to do as he likes on his own ground without any regard for his neighbour, as long as he is in accordance with the laws and the various rules and regulations of buildings in regard to sanitation, etc. He may come to any lawful agreement he likes with the adjoining land owner to build in a manner likely to be of mutual convenience to each as regards air, light, space, etc.; or each may build in the manner he may prefer without paying attention to his neighbour's convenience; neither need any new building raised against an existing building necessarily meet the convenience of the neighbouring property as regards light and air, unless, of course, the "servitudes" spoken of above exist. It is a regulation, however, that if, for mutual convenience, and to profit by the minimum dimensions granted for the area of adjoining courtyards, adjoining property owners agree to construct their courtyards one next to the adjoining one—or if in the case of a new house built against an existing house it is agreed that the new courtyard shall be built so as to continue the open side of the existing courtyard—then the house owners must promise that such arrangement shall be maintained.

The only law, therefore, which gives a natural prescriptive right to an opening (which in any case can only be one useful for light or air and not for purposes of view) is that of article 675 of the Civil Code, enjoining that in a party wall—a division wall built by mutual consent half on either side of the line dividing the two properties—an opening which has existed for thirty years becomes prescriptive, and the adjoining building owner must so build his house as to form a courtyard of proper dimensions around this opening; but there is no other restriction regarding

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the height of the walls of this courtyard than the usual building rules regulating the height of buildings on courtyard sides. If, however, such opening exists in a boundary wall contiguous to the dividing line of the two properties—viz., raised entirely on its own ground on one side of the dividing line but touching this line—then such opening can never become prescriptive.

Tenants of the whole house or portions of the house or premises have no claim on the adjoining owner for detriment to light or air, for on letting they are supposed to be aware of the adjoining owner's natural rights, and their only claim is in cases where they have been made to understand in error that their light could not be interfered with, and in this case they have only one course open—viz., a claim on their landlord for a decrease of rent or cancel of lease. A case in point may be mentioned, that of a tenant who had for some time rented a flat the back windows of which obtained their light from a regulation courtyard open on one side towards the vacant neighbouring property. The property owner having recently built on his ground, and for some reason not having—as is usually the case for mutual convenience—built his own courtyard opposite the courtyard of the adjoining property, the result is that the rooms taking light from the existing courtyard have suffered much prejudice as regards light and air; but the tenants have no right to complain, for the courtyard on which their windows are lighted is constructed in accordance with the regulation dimensions; they could claim for a decrease in rent, but have no recourse against the adjoining owner.

THE SANDING-UP OF TIDAL HARBOURS.

THIS was the subject of a paper read on Tuesday last before the Institution of Civil Engineers by Mr. A. E. Carey, M.Inst.C.E. The importance of preserving harbours, upon the construction or improvement of which many thousands of pounds have been spent, must be sufficiently obvious to all maritime nations, and the communication to which we now refer consequently deserves attention, although it does not add materially to our knowledge on the subject. Its object is to indicate the effects of sanding-up in harbours (1) where no river debouches, and (2) at the mouths of rivers and estuaries. Probably no department of engineering work presents more difficult problems than those encountered by the marine engineer, and the possibility always remains that the value of his labours may be seriously diminished, if not entirely destroyed, by natural causes. An instance of such action may be found in the harbour of St. Ana Curaçao, cited by Mr. Carey, the entrance to which was permanently narrowed by a hurricane in the year 1877. Ports have often been established in places, as at Rye, Winchelsea, Sandwich, and elsewhere, from which the sea has receded for miles; and at other places, as at Liverpool and Preston, where navigable channels can only be maintained by extensive and costly dredging operations. In the case of other ports, of which we may cite London as an example, there are evidenced gradual changes seriously threatening the prospects of future navigation, and so extensive as to seem almost beyond human control.

In the earlier portion of his paper, Mr. Carey makes reference to the measures adopted in various countries for the preservation of harbours. He describes the steps taken to dredge and maintain the channels to the port of Ostend, where it appears that of three channels one is now definitely abandoned, and the other two can only be kept clear by the annual removal of some 950,000 cubic metres of sand. Similarly the port of Boulogne requires the annual dredging of 535,000 cubic metres of material. The author considers that dredging is the only satisfactory expedient for conserving working depths at the mouths of sand-threatened harbours. In this expression of opinion we find a candid admission of human inability to cope successfully against the great forces of Nature. Dredging, it must be admitted, is no real cure for lack of depth, and Mr. Carey is quite right in terming it an "expedient." In some cases the dredging of a channel across a river bar is of much benefit, so that by the adoption of a suitable section encouraging scour and deepening, and by the construction of jetties or spurs from the banks restricting the sectional area sufficiently to balance the increased velocity, the channel may be permanently maintained. In other cases the tidal forces are so powerful and are exercised over such extensive areas as to defy control. It is always important, however, to study the influences at work outside the entrances to harbours, and at the mouths, or in the estuaries, of rivers, if dredging operations and others measures are to be even moderately successful. This point is clearly recognised in the present paper. Stress is laid on the character and coarseness of sand as an important factor in its travel, and the method of travel along a sea bottom is described. By means of diagrams the author demonstrates the action of the flood and ebb travel on coast lines having standard contours and various arrangements of breakwaters and piers, showing in each case the position of the resultant shoaling; and, by a further series of diagrams, he indicates the contingent effect of a prevailing wind.

As an actual example of the extinction of a harbour by sand the author cites the obliteration of Ceará Harbour, in Brazil, a work which occupied ten years in construction at a cost of more than 400,000*l*. An instance might also have been found nearer home in the former harbour of Pagham, in Sussex, still indicated on most maps. This haven is completely sanded up, and the visitor will now find the site occupied by fields. Mr. Carey next refers to the harbour of Madras, detailing the original studies of the late Mr. Parkes, and stating the changes in the contour of the coast which resulted from the work of the first two years. Attention is directed to the fact that a progressive shoaling of the entire area up to the original seven-and-a-half fathom line has followed. The condition of things was exhaustively considered in a report to the Indian Government by the late Sir Andrew Clarke in 1879, and two commissions have since inquired into the state of the harbour. From these investigations it appeared that unless the opening of the harbour as originally designed were closed, and a new opening to the north-east substituted, the harbour would prove valueless as a shelter for shipping.

The author then takes up the question of harbour construction on the west coast of Denmark, where the only harbour is that of Esbjerg, and with this exception even fishing boats have no means of shelter beyond that afforded by the mouth of the Limfjord.

It appears that a large Government harbour was commenced in 1879 at Hirtshals, the estimated cost being 550,000*l*., but the work is now sanded-up and abandoned. After describing some harbour works advocated by him on the coast of Denmark, the author states the conclusion that, in view of the precarious nature of tidal harbour work, and the instances in which success has been only partial, a departure from established practice is desirable. Considering harbours of refuge to have a limited range of utility, except in land-locked positions, he believes that in many cases it would be practicable by means of piled structures to create shipping facilities meeting reasonable requirements. Such structures would certainly be inexpensive, and might easily be provided by municipalities and other local authorities in favourable situations, but they would scarcely fulfil general requirements, however carefully designed, and in rough weather they would be of practically no use. This suggestion is a somewhat unsatisfactory conclusion to a paper, which, although containing much interesting matter, brings us no nearer to the solution of the problem foreshadowed by the title. The sanding-up of harbours and navigable rivers still continues, and we hope further attention will be devoted to the question by members of the Institution of Civil Engineers.

NOTES.

Waterloo Bridge.

THE London County Council have now, we see, completed their act of barbarity on Waterloo Bridge by removing what were still left of the old finely-designed lamp standards, and the bridge is now vulgarised throughout by the substitution of the weak and commonplace lamp standards which are, we suppose, designs by the County Council officials, but which look as if they had been bought out of a foundry pattern-shop. That the old lamp standards were specially designed to suit the character of the bridge, and that they were admirable examples of cast-iron design, is no doubt a matter beyond the comprehension of the County Council. This is one of the worst and most inexcusable pieces of vandalism that has been committed in London in modern times; a grand monumental bridge has been completely spoiled and defaced; and we do not think that those who are responsible for this piece of stupidity have heard the last of it.

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Church School Buildings in London.

THE BISHOP OF LONDON has issued an appeal for the purpose of raising a fund from which to put the voluntary or church schools into a proper state of repair before they are handed over to the County Council, and to repay advances made by the present managers for work done to the fabric of these schools for which they are in debt. This appeal is a naïve confession that the church schools in London are not at this moment in a proper state of repair, a thing which is not creditable to the Government inspectors of Schools, who are supposed both to examine the scholars and to report on the state of the buildings; though, as we have often pointed out, this latter duty should be the work of trained and competent surveyors, not of amateurs. But this appeal clearly suggests that the County Council should have a very careful survey made of all the voluntary schools before they are taken over. Fortunately the London County Council is in a better position in this respect than the rural councils, since they have plenty of competent officials who can survey these buildings. In the country the task is not so easy, and we fear that several of the county councils have not been very businesslike in this respect, and have taken over a number of "non-provided" schools which required considerable work upon the buildings to make them efficient.

Fire Precautions in Theatres.

THE suggestion contained in the Report of the Theatres and Music Halls Committee of the London County Council that all such places of amusement should compulsorily be placed in telephonic communication with the Fire Brigade is an essentially reasonable one; and it is a matter for surprise, after the serious disasters that from time to time have been experienced in such buildings in various parts of the world, to find that in London only five theatres and four music halls are at present so connected. A more serious state of things, however, appears to exist in the case of Drury Lane Theatre. This is a theatre carried on under letters patent, and by virtue of section 4, 25 Geo. II., c. 36 (1751), these patent theatres were exempted from the provisions of the Act regulating theatres. According to the Report, this exemption still exists, and the County Council have only jurisdiction over such minor matters as exits and fastening doors, etc. If this be the case, reform is urgently needed and legislation called for, especially having regard to the character of the entertainments associated with this house, viz., pantomimes, where the audience consists largely of children.

Legal Effects of Notices to Abate Nuisances.

A POINT of considerable importance to owners of property has again been before the courts, in the case of Oliver *v.* Camberwell Borough Council, as to the effect of notices to abate nuisances under the Public Health (London) Act, 1891. Section 3 provides that, upon receipt of information as to the existence of a nuisance, the sanitary authority shall give such instructions to their officers as shall secure the existence of the nuisance being brought immediately to the notice of any person who may be required to abate it, and the officer shall do so by serving a written intimation. Section 4 then provides for the sanitary authority serving a notice for the abatement of the nuisance "on the person by whose act, default, or sufferance the nuisance arises or continues" or on the owner of the premises. As in section 4 there is no suggestion of time being given to the person served with the "intimation" mentioned in section 3 to abate the nuisance before steps are taken under section 4, those served with such notices have sometimes failed to distinguish between the "intimation" given by the officer under section 3 and the notice of abatement given by the sanitary authority under section 4, but the facts of this case illustrate the importance of so doing. The owners, having been served under section 3 with an intimation that a drain was defective and caused a nuisance, proceeded to carry out the work. It, however, subsequently appeared that the drain was a "sewer" for which the sanitary authority itself was liable, but the owner was defeated in his attempt to recover the expenses he had incurred from the sanitary authority on the legal ground that the intimation contained in the notice under section 3 did not place him under legal compulsion to do the work, as the notice under section 4 would have done, and, consequently, having voluntarily incurred the expenditure, he was held unable to recover.

The Heat Treatment of Steel.

MUCH valuable information is to be found in the sixth Report to the Alloys Research Committee of the Institution of Mechanical Engineers. Since the issue of the previous report the value of the work to which the Institution has accorded so liberal a support has been widely recognised, and we learn with regret that the committee is about to be dissolved, more particularly because there is much more work to be done in this department of research. The present report was undertaken for the committee by the late Sir William Roberts-Austen, who had been engaged for several years upon the inquiry, although ill-health and pressing official duties had long before his death prevented him from devoting so much time to the work as he desired. The necessary experimental work was entrusted to Mr. Merrett, of the Royal School of Mines, by whom it was carried to completion in accordance with the lines laid down by Sir William Roberts-Austen. Unfortunately no notes relative to the experimental work were found among Sir William's papers, and only a few pages of the report were actually written by him. The task of completing this important document was undertaken by Professor Gowland, also a member of the committee, assisted by Mr. Harbord, of the Royal Indian Engineering College, and other gentlemen. While we must admit that the report is admirably presented, it is in many respects inconclusive, and we feel sure that engineers throughout the world would feel doubly grateful to the Institution of Mechanical Engineers if that body could see its way clear to continue the great work conducted in the past.

Spherical and Framed Domes.

IN a paper recently read before the American Society of Civil Engineers the author presents some original matter upon a subject of much interest to our readers. Early architects possessed considerable knowledge of domed structures, but only in a general way, as may be inferred by examination of the reinforcement applied from time to time to some such buildings, but the actual point of weakness does not appear to have been known positively. Correct principles were formulated many years ago, but some engineers still design domes by the aid of incorrect methods. While the paper to which we refer does not cover the subject completely, it sets out the relations between the principal stresses in domes and their magnitude, and demonstrates a simple and rational method of construction which should be sufficient to enable any designer to deal with problems arising in ordinary practice. Some practical notes on the construction of masonry and metal domes contain a series of very useful suggestions.

"The Making of Architects."

THE paper under this title read by Mr. Maurice B. Adams at the Architectural Association, and printed in the present issue, is one of the most comprehensive and judicious summaries we have seen of what is required in the education and practice of the modern architect. We recommend to young architects especially his remarks on the necessary place which drawing must now take in the working out of building design. Mr. Adams has not exaggerated drawing at all; he fully recognises that fine drawing is not necessarily fine architecture, but it is the method of getting a fine architectural idea into shape, and it is an absolutely necessary preliminary in days when the planning of complicated buildings has become such an important practical problem. Men who are beginning their career will be wise not to listen to those who tell them that drawing is all nonsense, and that they will be better architects by working with their own hands on a building. Our own experience is that the men who produce the best architecture also, as a rule, draw the best; and when we get a bad drawing sent to us it usually represents a bad design.

A Society of British Sculptors.

WE see it announced that a "Society of British Sculptors" has been formed, of which Mr. Brock is President. The feeling which led to the formation of the Society was that, as Mr. Brock remarked at the meeting held at the Institute in Piccadilly to constitute the Society, the art of sculpture had suffered in this country from being inadequately represented; which is unfortunately too true, having regard to the poor accommodation given to sculpture at the Royal Academy, and the way in which everything is sacrificed to painting. Had things been otherwise, we should have thought the institution of a special Society unnecessary; but as long as the Royal Academy remains practically an academy of painting, such a movement on the part of sculptors is not surprising, and can

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only be regarded with sympathy. The most difficult task of the Society will be to get the general public to take an interest in the subject, sculpture being in this country the least popular and the least understood of all the arts.

Royal Academy Lectures.

PROFESSOR CLAUSEN'S fourth Royal Academy lecture was delivered on Thursday afternoon last week. The subject was "Titian, Velasquez, and Rembrandt." Professor Clausen spoke of these painters as perhaps the greatest that the world has yet produced. Above praise, it seemed an impertinence to discuss their merits, and he therefore drew a comparison between their respective methods and some of the qualities distinguishing their work. Dissimilar as were their methods, the fraternity of greatness allowed their works to hang side by side in perfect harmony. In Titian was found the meeting-point of the old and the new. Greatest perhaps as a portrait painter, and marvellous as was the detail shown in some of his portraits, the lesson they taught was the effect that is attained by leaving out unessentials. His colours were few, and he did with them all that it was possible to do in colour. The largeness of effect produced by his pictures was due rather to the colour than the form. The interest of light and shadow was carried into every part of his picture, a striking difference to the concentration of effect aimed at by many masters. Passing on to Velasquez and Rembrandt, the lecturer pointed out Titian's great influence on their work. Velasquez's portraits were peculiar in that they showed no trace of his own personality. He was a dispassionate and remorsely acute observer, who painted with extraordinary truth and accuracy. Rembrandt, on the other hand, showed a greatness of sympathy—a poetic and sometimes dramatic effect realised by neither Titian or Velasquez. His drawings and etchings were equally characteristic, and he was without doubt the greatest of etchers. Professor Clausen summed up a most interesting lecture with: "Titian saw the noble aspect of things; Velasquez presented them with absolute truth; and Rembrandt regarded them with the eyes of a poet."

Royal Academy Lectures—continued.

PROFESSOR CLAUSEN'S fifth lecture, at which there was an exceptionally large attendance, dealt with open-air painting and landscape. Landscape painting for its own sake was a comparatively late development, though the bits of landscape introduced by early painters as backgrounds were often of great beauty and interest. Titian was the first real constructor of landscape, though in his case, too, always subordinate to figures. Pure landscape began with Claude and Poussin; Claude's titles and figures ("The Queen of Sheba," etc.) were mere names, the interest lay in his treatment of sunlight and atmosphere. The great French school of landscape painters of the last century—Troyon, Rousseau, Daubigny, Corot—were all in artistic style the followers of Constable, as the later impressionist landscape painters were the followers of Turner. Landscape had a wider range than any other branch of painting; but it was not an inventory of facts; its object was to show nature under various aspects of light and weather, to deal with the elemental forces of nature; it was an appeal to the primitive instincts of cultivated people looking at nature from the point of view of civilisation. The subject of a landscape was more determined by emotion than reason; all great landscape paintings were records of moods. In the power over gradation of light Turner alone equalled Claude, and, moreover, had the power of giving minute detail without losing breadth. The great difficulty in landscape painting was the sky, for that in fact controlled everything; the next was the painting of trees—the difficulty of making them *live*. Reynolds, who touched on everything, recommended the study of the general composition of a tree rather than details, though Bellini had shown that the complete impression might be got by infinite labour in detail. Constable, Turner, Rousseau, Corot, Daubigny, and he would add Cecil Lawson, saw trees as a whole; Corot invented a beautiful generalisation of his own for conveying the effect of foliage with light through it. Corot and other landscape painters who worked much in Rome showed the influence of Italy in their sense of style. Millet was the only one who approached nature with the simplicity of aim of the early masters, yet with a modern method. He showed the importance and beauty of a simple form of life. His figures were types; those of Bastien-Lepage, more accomplished as an executant, were rather individuals—portraits. Referring to the representation of action and movement, Professor Clausen said that the painter had to give an impression derived from what preceded and followed the moment of action represented, as in a group of labourers alternately hammering on a bolt we saw the various stages of the action simultaneously. Nothing in nature stood still, and the object of painting was not to take a snap-shot, but to convey the impression of movement. Even the difference between a moment of sunrise and of sunset light might be analysed into the difference between a progress towards more light and a progress towards less light.

Powis Castle, Montgomeryshire.

SOME extensive improvements are being carried out for Lord Powis at his seat in North Wales, comprising an electricity generating station, to be constructed in the rock, under Mr. G. F. Bodley's superintendence. Commonly known as Pool Castle, or Castell Côch, from the colour of the red sandstone of which it was mainly built, Powis Castle stands upon an eminence, at the foot of which lie the gardens, laid out after the Dutch manner, upon lines of terraces, in the midst of a hilly park, in which are some grand old oak trees, about one mile distant from Welshpool. The site commands a fine view of the Severn valley, with the Freiddyn hills on the marches beyond. In 1828-9 Sir Robert Smirke made some alterations of the interior, which modernised its general effect, and added a Doric order of four columns to the principal garden entrance. There are half round bastions at the angles, and the old gateway, flanked with two massive drum towers, opens into the principal court. The great gallery, from which an apartment has been cut off, measures 117 ft. by 20 ft., and there is a state bedroom which was occupied by Charles I. The castle has seen many episodes of border strife and warfare since its original erection 800 years ago by Cadwgan ap Bleddyn; and during a long period formed the stronghold of the lords of Powys. In 29 Elizabeth the castle and lordship were bought from the Greys of Powys by Sir Edward Herbert, second son of William second Earl of Pembroke. From his descendant, Peiroy Lord Powys, who held it for the King, it was captured in 1644 by General Sir Thomas Myddleton, whose artillery had greatly damaged the walls. The sister and heir of George last Earl of Powis, of the family of Herbert, married (1784) the son and successor of Robert Lord Clive, the victor at Plassey; their son Edward, second Earl of Powis of that house, assumed by royal licence the surname and arms of Herbert. There are views of the castle by W. Wallis and W. A. Le Petit, 1828, after drawings by J. P. Neale.

Mr. Grosvenor Thomas's Pictures.

AT the Woodbury Gallery in Bond-street there is a collection of about fifty oil-paintings, mostly on a small scale, by Mr. Grosvenor Thomas, an artist who, though English (or we presume so), seems to be better known on the Continent than in this country. He is a painter of landscape in the broad style of which Constable and Müller may be said to have been founders, with some apparent influence from Corot; the Corot composition though not the Corot texture. This influence is apparent in "A misty Eve" (20; the crescent moon half seen through the trees is a great deal too large) and in a larger and more important work, "Evening" (44), which at a distance might very well pass for a Corot, though the handling on a nearer view is quite different. The sharp oblique line made by the slanting birch-tree trunk across the principal mass of foliage is rather disturbing to the repose of the scene. The artist's favourite type of subject consists in old houses grouped with or partially hidden by trees; one of these, "Old Manor House, Lustleigh," is painted twice; No. 5 is the more important, and one of the best pictures in the collection; the white house is grey in the twilight, with a warm light from one of the windows, and the moon (again much too large) seen through the straggling trees. This kind of theme is several times repeated, and always with effect, though the work must be judged at a discreet distance; it is too impressionist to bear close inspection. "The Canal" (6) is one of the best of this class, also a moonlit scene, with a finely-painted bit of sky. Among others to be specially noticed are "The White Cottage, Studland" (11); "Solitude" (15); "The Mill" (23); and "Cluden Mill, N.B." (4). Is this last the Cluden of Burns's ballad?

> "We'll gae down by Cluden side
> Through the hazels spreading wide."

The sketches of sea are too amorphous—it is the fashion now to th[illegible]

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that any smudge will do for sea provided you have the colour right; but Nature "rules the waves" a little more than that. But as a whole this is an interesting exhibition, and out of the commonplaces of painting.

Messrs. Doulton's Work.

MESSRS. DOULTON have been exhibiting this week, at their showrooms at Lambeth, the work they are going to send to the St. Louis exhibition. This includes a case of their glazed stoneware, the characteristic product of the Lambeth establishment, and two cases of china ware from the Burslem manufactory. A good deal of the design and style in the latter is suggested by Sèvres, and it is as good as Sèvres ware. Some of the plates with floral designs are charming, but we do not approve of landscape and figure painting on porcelain, and especially not on the surface of a plate, which is the wrong place for a picture, and should only be occupied by purely conventional decorative design. The exhibits of Lambeth ware are admirable in style and design, and will uphold the credit of the house in this class of work. There are also some architectural exhibits, including a white half-glazed terra-cotta to which the name of "Carrara" has been rather unfortunately given, with the mistaken idea that it suggests Carrara marble, which it certainly does not. Two examples of fitted bath-rooms are to be sent out, with white marble walls and floor and white vitreous enamel baths; these are admirable in every respect except that of a water-closet being made a part of one—with a door and partition it is true, but there should be no connexion. American sanitary makers are very backward in this respect, and fit their most costly bath-rooms with a water-closet alongside the bath, which is barbarous; English makers should set the example of keeping the two apartments entirely separate.

THE ARCHITECTURAL ASSOCIATION

AN ordinary fortnightly meeting of the Architectural Association was held on Friday evening last week in the Meeting Room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., Mr. Louis Ambler, Hon. Secretary, presiding. Mr. Ambler said he was extremely sorry to state that the President, Mr. H. T. Hare, was suffering from a severe cold, which had deprived him of his voice, while the vice-Presidents, Mr. R. S. Balfour and Mr. Arnold Mitchell, were both unable to be present.

Mr. H. Tanner, jun., Hon. Secretary, having read the minutes of the last meeting and some nominations, the following gentlemen were elected as members:—Mr. G. Sherrin, jun., and Mr. J. C. Moor. The following gentlemen were also re-instated:—Messrs. H. A. Douglass, C. J. Tait, G. L. Crickmay, and E. M. Joseph.

New Premises Fund.

The Chairman announced the following additional donations to the New Premises Fund:—Messrs. S. B. Beale, 3*l.* 3s.; Hampden W. Pratt, 2*l.* 2s.; W. L. Spiers, 2*l.* 2s.; J. C. Stockdale, 2*l.* 2s.; J. Soutter, 1*l.* 1s.; and J. Sulman, 1*l.* 1s. A vote of thanks was accorded to the donors.

The late Mr. Saxon Snell.

The Chairman said he desired to propose a vote of condolence to the relatives of the late Mr. H. Saxon Snell. Mr. Saxon Snell was a very old member of the Association, whom they all knew, and whose works they knew. Mr. Snell had a very large practice, and his death was a great loss to the profession.

The motion having been agreed to in silence,

Mr. Tanner announced the following donations to the library, *i.e.*, "Brickwork and Masonry," by C. F. Mitchell, presented by the publisher, Mr. Batsford; "Aids to the Mathematics of Hygiene," by C. B. Ferguson, presented by the publishers, Messrs. Baillière, Tindall, and Cox. On the motion of Mr. Tanner, a vote of thanks was passed to the donors.

As to the Making of Architects, with Examples of Draughtsmanship.

Mr. Maurice B. Adams then read the following paper, entitled, "As to the Making of Architects, with Examples of Draughtsmanship."

All who aspire to become worthy of the delightful pursuit of architecture will readily admit that the subject which furnishes the title of this germane paper is of paramount importance. To the members of the Architectural Association the enquiry naturally presents a theme of particular interest, and however opinions may differ as to the details of the curriculum to be employed in the making of architects few are likely to disagree in the abstract as to the vital character of a matter so intimately associated with the qualifications and equipment of those who are entering upon the profession of architectural art. We live in an age distinguished above all things by educational competition, while a correspondingly restless ambition actuates all sections of the community, and in nothing perhaps is zeal displayed more conspicuously than in technical educational projects intended for the bettering and amelioration of the professional and working classes. It is impossible for any class to remain indifferent in this matter, and no one who has to earn his own living, to put it on the rock-bed of existence, can afford to be left behind. The bread-winner has no choice but to work strenuously, and, if distinction is aimed at, no shifts or working by halves will do. The *sommités* of the profession assure us that "there is plenty of room at the top." In less fortunate circles, however, each year every worker no doubt finds more effort is needed to maintain a place of security on the ladder of success, and certainly more service of a higher standard of efficiency has to be rendered. For architects beyond all question the survival of the fittest alone remains a certainty, consequently a more excellent status is inevitable. Thanks to the enterprise of a few, an advance towards proficiency has already been made, and some steps have been taken to improve the methods in vogue for the making of architects.

The disinterested and capable work carried on by the Architectural Association during so many patient years furnished the basis of operation, and induced many to desire something higher and more complete. It thus came about that the educational scheme has lately expanded with the notable result that the Architect's Day School has entered upon its initial stage, and thus far may be accepted as an accomplished enterprise demanding our hearty and united support. The success attending this decided departure suggested to me the idea of promptly assisting its development by bringing about the free gift of the collection and buildings of the Royal Architectural Museum, so as to solve without further delay the long experienced difficulty as to the acquisition of more suitable accommodation in which to conduct this great work. As so many are still under the impression that the Museum was in financial difficulties, let me again say that this was not so, because the annual income which we for years past administered at Tufton-street amounted to between 1,500*l.* and 2,000*l.*, and the Museum had no monetary liabilities whatever.* It is a matter of congratulation that this important transfer was rendered possible by the unanimous concurrence of the Council and subscribers of the Royal Architectural Museum, who would not have handed over such an exceedingly valuable property to the Architectural Association had any doubt whatever existed as to the merits of its present educational undertakings.

We stand, however, only on the threshold of the movement, which has now entered upon another phase owing to the recently formulated design of the Royal Institute of British Architects for establishing teaching centres for architects in various big towns all over the Kingdom, under the advisory control of an Educational Committee at Conduit-street composed of some of the foremost architects and educationalists of the day. It will thus be evident that we have only commenced the task which stretches out with increasing interest, looming large in the potentialities of the future. The necessity of a more systematic plan of educating students in architecture is being more clearly recognised and more generally accepted. I am persuaded that nothing is better calculated to break down the barrier of union between those within and those without the pale of the Institute than this fundamental question on which all the best architects are united. The primary object of this enterprise which thus stimulates the imagination is not concerned so much in furthering professional interests as in promoting better building and more excellent architecture.

This is the standpoint whence I propose to consider my subject, upon the choice of which permit me to say one word. The committee, in arranging the series of specialised topics for discussion during the current session, requested me to contribute a paper on "Pen Drawing." Already, as some here may remember, I have read two papers in these rooms on Architectural Illustration and Drawing. It appeared to me, therefore, that we might with some advantage on this occasion diversify the consideration of draughtsmanship by carrying our conclusions beyond the limitations of the sketch book, the drawing-board, and the tee square. Besides this, since I relinquished my charge at Tufton-street, without being cognisant of what others have been doing in respect to this question of education for architects, I have realised the liabilities involved in the step which has been taken, and consequently appreciating fully the accruing responsibilities which are calculated to tax our resources very seriously, I beg leave to avail myself of this opportunity to impress upon everyone whom I may hope to influence the abounding need of a united effort to see this matter through successfully in the honourable disinterestedness of *esprit de corps*. We must rise to the occasion, and incidentally it may be timely to recall the American citizen's loquacious observation as to the "risk of attempting to stop half-way while going up a waterspout or down a waterfall." The unkindest chill of all would be that inflicted by the wet blanket of indifference among our fellows.

In respect to drawing, I do not intend to overestimate its value. I am fully cognisant of the current fashion to warn students against the trick of draughtsmanship. The business of an architect is to build, and not to draw. A good building perhaps might be erected without good drawings, but it is almost always certain that the best designs are shown by the best drawings. Michael Angelo said: "Let whoever has attained to the power of drawing know that he holds a great treasure." Art consists in the tangible and capable expression of an artistic idea, and good building as a definition is not intended only to mean utilitarian work, though of course it comprises structurally sound thoroughness and practically planned buildings arranged with due regard to sanitary construction. To all this there must be added, however, an embodiment of good proportions which shall govern its design by refined perception of architectural grace and taste in style. Its conception must be the result of personal thought and distinguished by the imprint of a vitalising individuality. These, surely enough, are the qualities essential to the making of beautiful and convenient buildings, each in its degree and size adapted to the everyday needs of our domestic and municipal life. The architect's chief endeavour, notwithstanding the surmounting weight of our commercialism, should be devoted to the production of thoughtful and artistic buildings worthy of our national greatness and in harmony with the aspirations and activity which distinguish the political, ecclesiastical, and philanthropic enterprise of the Empire.

In spite of the adverse conditions under which we not infrequently have to build, and the haphazard way in which competition designs are chosen, also not forgetting our many personal shortcomings, this enumeration of what ought to constitute our ideal is no pragmatic afflatus or Barmecide of buttery adjectives. We cannot regard with complacency the lost chances and wasted opportunities which so many pretentious and inconsequential buildings throughout the land continue every day to place on record. We must deplore the popularity

* This income of the Museum ceased, of course, when the School of Art was closed, and the subscriptions stopped on the transfer of the Museum property to the Architectural Association.

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of such chaotic and petty productions, devoid as they are of all breadth and tasteful solidity, an eyesore and an incubus prepared for posterity. Ruskin justly said such work is beneath the mark of attack and the level of contempt. The order of the day is cheapness, and that has much to answer for, but monied imbecility is the worst imbecility of all. Most of the common architecture of our cities is simply that, both vulgar and expensive, seeking to impress by vainglorious noise, heralding its costliness from groundline to ridge as if obtrusive opulence might be accounted a virtue.

Although it will perhaps be said that the average quality of contemporary design has in some ways improved of late, no one can doubt that a vast room for betterment exists. Assuredly if we would develop the art of our time it will not be done by posing with a patronising aloofness of superiority, but by a manly grasp of the fascinations of the day, its possibilities and its needs. We shall never better our work till we give it more size and boldness, and by omitting outlay on finicking finishings spend more on thickening our walls, and in giving recess to our doorways and window openings. With regard to the making of architects, we must insist upon the study of solids and voids as a matter of the utmost consequence, for without a recognition of the importance of shadow and value of wall space our facility of draughtsmanship and paper proportions becomes illusive, and can avail us nothing in comparison with the spacings of light and darkness. "The one must be broad and bold enough not to be swallowed up by twilight, and the other deep enough not to be dried up, like a shallow pool, by a noonday sun." Bald crudities and uncouth oddments in building design possess nothing in common with fine architecture, though it may be admitted that fads and mannerisms have had perhaps their passing uses by furnishing a counter irritant to the normal commonplaces of ugly dulness of which we certainly have had our share. Singularity, however, is a vastly different thing to good taste, and "L'Art Nouveau" supplies no substitute for beauty in form or the spirit of good design. Such a perverse masquerade of singularity, in the hope of obtaining credit for originality, may for the nonce impart a degree of picturesqueness to the architectural horizon, and the flauntings of a shallow independence of precedent with the intent of seeming clever may afford a temporary relief from the sunless monotony of dismal propriety, but the debonair of to-day thus indulged only incurs the inevitable reaction of to-morrow demanding equally unsatisfactory stimulants in the form of other extravagances. Smart adroitness is a marked characteristic in all Barocco work, but its cleverness is only of the stop chamfer type, and soon tires.

Mistaken departures such as these are due to a disregard or lack of a just appreciation of true principles, with the consequent loss of worthy ideals, in the absence of which taste is accounted as if it consisted in the aimless accumulation of so much quaint bric-à-brac or the bathos of tawdry gossip in design. First one transitory craze and then another, with no more substantiality than a fashionable wall-paper, becomes the vogue in the chase after novelties, while, with the same intent, other caterers for popularity attempt to evolve an "eclectic" style by an incongruous blend of the peculiarities of several historic styles rolled into one. Before we can hope to educate the public in discriminating between such vagaries we must disassociate ourselves from this sort of thing and, by showing a better way, endeavour to overcome the complacency with which the public accepts the ugly in preference to the beautiful in all things belonging to building. How long are architects to placidly accede laying down to this prevalent choice of bad designs instead of good ones? In establishing a more systematic schooling in architecture we are taking the only reliable road to reform in such matters. The enterprise entails a serious effort, but that which is not worth an effort is not worth doing at all. Architectural laws can and ought to be taught in our training schools just as plainly as English, and spelling, and grammar are taught, and there is no reason why building construction treated specially from an architect's standpoint should not be scientifically taught and practically demonstrated in properly appointed workshops all over the country. The whole movement must be directed and considered as a unified explanation of building requirements in their bearing upon the actual practice of architecture, dealing with its problems in the round rather than in the flat or on paper, and we ought also to form, with this object, a well-selected series of exhibitions of modern building appliances of the most recent make, making the choice of improved contrivances and of all kinds of materials quite apart from any advertising considerations. In arranging such an enterprise as is here indicated, let it be clearly understood that those who have identified themselves with it so far lay claim to no special prescience, and have not the smallest wish to arrogate to themselves more than their share in this matter. The project must be co-operative in the sense that it needs the cordial help of all concerned. If we are unable to see eye to eye in all matters of taste we can and must stand shoulder to shoulder in furthering this undertaking for the improvement and far-reaching interests of our art. Exaggerated aspersions on the present want of method in the teaching of architects will only tend to alienate the more conservative among us, and unless the profession generally is united in a disinterested determination to work with a will in this affair the success which we hope for will not be realised.

It would be a mistake to only establish a Metropolitan Bureau of Architectural Education, and the policy adopted therefore should be on broad and comprehensive lines. In common with all cosmopolitan undertakings the working administration must possess a centre of organisation located in London. Without representative association no autocracy, however capable, can hope to compass the far-reaching necessities of this measure of professional education, which in that sense must embrace a national scheme. Members of our profession in our big towns understand as keenly as anyone the need of this democratic aspect of the affair, and Londoners will only be too glad to avail themselves of the valuable assistance of their provincial *confrères*. There must, of course, be an unhesitating recognition of the central authority, but to obtain this hearty union of forces architects outside the London district must be accorded a proportionate share of the management. The opportunities to be thus afforded will, I believe, accomplish more to raise the status of the profession throughout the country than any scheme of Registration by Act of Parliament could possibly do. No one pretends that a panacea for all our needs in this matter will thus be obtained, but assuredly the busy murmur of the working hive of willing students should rouse the profession from its lethargic lullaby, which can no longer be indulged in with comfort even by the prophets of a fanatical belief in laisser-faire, owing to the entire change in the condition of things brought about during the last fifty years. It must be taken for granted that a few well-meaning individuals will prefer a sort of mugwumpian isolation so peculiarly attractive to the outsider, but I am optimistic enough to believe that the needs of this educational development when clearly stated will awaken the enthusiasm of all who have the interest of good building at heart, and especially the younger and more ardent members of the profession. "Youth without enthusiasm means a maturity without faith and an old age without hope."

There is no notion of attempting a genesis of a fresh cult or the invention of a new style, and we are not concerned in the revival of any bygone phase of building art. Enough energy has already been expended on such like sterilised enterprises by progenitors of defunct forms or details. It is a matter of indifference whether we have old architecture or new architecture, lintel or arched construction, but it is of the utmost consequence whether we have architecture worthy of the name. Our endeavour should be concentrated in producing beautiful work, caring but little whether it is new or not. Time alone can insure a true evolution of style which relies on the labour of multitudes, and not so much on the inventive efforts of the few. "The able architect will probably adopt as his own any type of the day which may be going, and, working at that, will impress it with freshness and individuality, taking liberties with his text no doubt, though not in defiance of its rules or for the greed of notoriety, but he will invest it with originality just in the same way as a master of speech will use the vernacular, with freshness and style of expression to convey ideas which words alone, without such infractions, could not adequately describe or graphically indicate." Such a gift comes from the gods, and cannot be given by any School of Arts or Royal Academy, and no examination or training can insure it. I do not presume for one moment that the best studio equipment or the most cultured class system ever invented will produce a single architectural genius, though it is possible that by such means a potential master in architecture might be discovered:—

> One of the few, the immortal names,
> That were not born to die.

The most that we can hope for in a general sense is to render likely a levelling up towards an improvement in contemporary work more in harmony with the canons of architectural taste by leaving no longer the making of architects as a matter of chance to the happy-go-lucky rule of thumb. With this end it is desirable to co-ordinate and centralise our scheme of training. Let no one suppose, however, that anything approaching a sort of professional forcing house or system of cram is in process of contemplation where artistic capacities will be impaired by abstract theories and technical prolixities. It is to be an "occupation" school conceived and conducted by architects for architects, therefore the artistic and inventive powers of no one are likely to be reduced to the level of mechanical plodders by any inflexible type of regulation teaching in dealing with matters of design. In the more advanced stages of study I presume the advantage of practising architects of repute acting as visitors will still obtain. The croakings of those who seriously warn us do not appear to me to be justified when they anticipate that the aspirations of artistically minded pupils will be stultified by scientific teaching of this sort. These worthy people seem to fancy that we had better by far leave things as they are, with the assurance that the best will always come to the top. Absence of taste, paucity of ideas, and lack of knowledge are not quite identical, but they generally, however, exist together. Some have argued, and argued well, that poverty is no hindrance to genius, and Mr. Carnegie lately said that the greatest inheritance a boy could possess is poverty. Doubtless these conclusions can be supported by special experiences, and it is an old saying that man is the architect of circumstances. None the less it is obvious that forethought would demand a guide to successfully climb the Alps, and no man would wisely put to sea in a skiff.

To the "individual of infinite resource" adverse circumstances no doubt furnish an incentive to effort, while poverty may develop the acquisitiveness of genius; indeed it is open to question whether impecuniosity ever hindered the ultimate advance of anyone who is possessed of a real and enduring love of his art. Architecture has, however, been adequately described as the most difficult work a man can put his hand to, and when a student affects an artistic consciousness it will, nine cases out of ten, prove a great personal gain to him to learn that the pursuit of architecture demands more than a superficial æstheticism to enable him to cope with the task he is taking up. If, in the tenth instance, such a discovery on the part of the student should prove too much for his artistic precocity, then surely the exception which proves the rule must be a weakling indeed.

Whatever disadvantage the English pupil has experienced as compared with his continental contemporaries, I think we are justified in congratulating ourselves that anyhow he has escaped the stereotyped mannerisms and academic formalisms so conspicuous in much of the otherwise accomplished modern architecture abroad, though we are bound to recognise the traditional methods distinguishing the best modern buildings of the French. The over-accentuation of individuality so detrimental to the uniformity of effect in our English towns is chiefly due to the absence of comprehensive schemes compatible with the dignity of architectural treatment. The uncompromising insistence of personal rights by different owners of circumscribed sites precludes anything approaching the grand scale of setting out the façades of our thoroughfares on the lines adopted in France and Germany. The fiasco of the L.C.C. Strand-façade improvement scheme is a case in point. Moreover, the position insured to architects in reference to the Governmental Departments of Public Works abroad has no counterpart in this country. While recognising this difference, we do at least obtain a picturesque personality in our work which, however, is gradually becoming more subservient to recognised methods of design, and it is a gain also that the British student does not waste

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time in emulating the foreign system of draughtsmanship which starts with the thinnest of lines and finishes with shading and sponging, and sponging and shading, till the utmost finish is obtained and all individuality is gone. Our drawings are too often mean and poor, and our pupilage experiences are frequently a disgrace, but I am convinced that for practical efficiency, as also for the retention of what semblance of artistic tradition remains at all in England, no satisfactory substitute for apprenticeship under really qualified and conscientious masters is at all probable, and therefore we shall do well to supplement and improve this old plan, instead of attempting to supersede it by importing German ideals *en bloc*.

The general consension of opinion as to the experience resulting from the German and other foreign colleges' course of four and more years of class training amounts to this, that when young architects so taught commence to practice they display, as you might naturally expect, a conspicuous want of practical knowledge, and fail from lack of an acquaintance with the application of much that they have theoretically acquired, so that the older architects abroad recommend at least a year's apprenticeship after leaving the schools, and for those who cannot thus afford another twelvemonths in learning their business and can do without holidays, it is advised that they shall do office work during their vacations. In any event whatever method is adopted the most must depend upon the aptitude of the pupil. A man ought anyhow to be a 'prentice before he can take up the position of a master with advantage, and the best pupil needs the best teaching, for taste and ability may run wild if not curbed and properly cultivated. A year's probationary work in such a school as we are intending will afford the student an opportunity prior to his articles for ascertaining whether the calling of an architect is likely to prove congenial to his particular capabilities or not. If by this process of elimination some failures could be prevented so much the better for art and for the individuals themselves. Much of the mediocrity of our everyday designs would be spared us if these reasonable precautions were taken. A smattering acquaintance with many things, or a casual fancy for all styles of work will not qualify a man to design good modern buildings any more than an all-round elementary course in several languages would enable him to write well in any one of them.

Whether it is ever probable, even if it were desirable, that the Government will establish a National School for Architecture in this country is another question beyond the range at present of practical politics. Our obligations, however, in the meantime are definite and clear, it being evident that architects must combine in some well-concerted scheme to bring the study of building art and its allied technical crafts into conformity with the higher educational developments of our time, which have made such overwhelming advances during the past few years in France, Germany, and America. England is shockingly behindhand in technical training all round, as Sir Norman Lockyer demonstrated in his British Association address last autumn. It would be worse than folly for architects to ignore this aspect of the subject from a professional point of view, which manifestly is of vital consequence for every good reason. The architects of this country must realise their position in this matter and take care to befit themselves in order that they may hold their own with engineers and kindred callings, and if architects are to occupy with credit an assured place in current affairs quite as distinctively and well recognised as those held by the legal, medical, and other professions, thoroughness and efficiency must be guaranteed. Would we secure the patronage of the public, we are bound to qualify our students in order that they may merit its confidence. Success is rare, and general rules can only be provided for ordinary work, and not for anything requiring invention, and as to how far the individual will compass success must unquestionably in the main depend upon himself, as well as upon his capacity for continuous labour. The older he grows the more fully will he understand that self-reliance is the best help of all. Distinction comes inevitably of personal resource, and no reputation will endure which is not based upon real artistic merit. Friends and influence, of course, are most valuable in securing commissions, but it by no means follows that luck of that kind alone will insure a reputation that will live. No buildings capable of affording lasting pleasure and delight the imaginations of generations are ever likely to be produced by men who are satisfied to remain architects only in name, content to relegate all the difficult problems of their building work to the quantity surveyor or to the contractor, or the builder's operatives, retaining only to themselves the fancy part of their business, which may be acquired in a casual rough and ready fashion, and leaving the detailing and even much of their so-termed designing to their subordinates and assistants. Of such inefficiency we have had ample experience with all the attendant evils of vicarious practice so familiar as to need no further amplification. Ruskin somewhere says, "it is foolish and insolent to imagine that the art we practise is greater than any other, but it is wise to take care that in our hands it is as noble as we can make it." There can be no nobility in taking credit for work done by others. The architect must think for those whose duty it is to execute his designs, and must convey the intentions of his mind to them in such a way as the weakest capacity can grasp and the feeblest hand can execute. Whatever may have been the position of the architect in the Middle Ages, and whatever his methods then were, he can no longer now depend upon the workmen as if they had been brought up on traditional lines, for the last remnant of the vernacular in architecture went the way of Queen Anne nearly two hundred years ago.

The architect can nowadays only calculate on the co-operation of artisans subordinated by labour emancipation, and if satisfactory buildings are to be produced the architect must rely upon himself. Some theoretical reformers decry such a position for the modern architect, to whom they would accord a much less important post, permitting him only to confine his attention to the shell or carcase of a building, leaving its enrichment and elaboration in an architectural sense to trained specialists from arts and crafts schools managed by professors, the notion being, as would appear, that architecture can be produced in a co-operative system of supply, here a little and there a little as if it were an applied art. In advocating this fallacy its authors overlook the risk of incongruity which must ensue, no matter how excellent individually the various moieties of the work might be. The controlment of the architect as the master builder is essential to the unity and harmonious combination of the whole undertaking. Everyone of practical experience, in dealing with the methods of capital and labour, knows perfectly well how impossible any such fantastic scheme of working would prove to be under the existing conditions of protectionist trade-unionism on the one hand, and the troublesome capriciousness, shall I say, of the egotistical handicrafts man on the other. It is to be hoped that no student will be carried away by any such illusive propositions. Every architect worthy of the name would certainly only be too glad to give a capable craftsman as free a hand as possible, and willingly accord him every credit for his valued assistance in the execution of the work. But in no sense can architecture be treated as an applied art, therefore we need not further discuss this subordination of the architect in the way propounded. He of all men engaged in building operations must be responsible for the design and the supervision of its execution. I confess but little sympathy with those clever folks who advise students to become skilled artificers in some one or more of the decorative crafts, telling them that, by becoming ornamentalists in plasterwork or adepts in smithery, they will become better master builders. On the other hand every man up to a certain point can but be the gainer by some practical experience in carpentry and joinery. I speak from more than theory, having been myself an apprentice to a builder at the bench. It is impossible, however, for any individual to become manually efficient in all the branches of the building trade, and in my judgment a young architect's time and energies would be better occupied in acquiring a general knowledge such as the scheme now promulgated will render possible. The usual methods of practice are quite onerous and complicated enough without inventing eccentricities of working for the sake of a passing craze.

We are thus brought face to face with the initial conditions, which allow but little choice in this matter, consequently in the making of architects one of the essentials peculiar to the calling must consist in a thorough initiation of the student in business management based upon an intimate acquaintance with the technical details of contracts and their legal consequences, as well as Building Acts and By-laws. It is no longer sufficient to relegate such matters to building surveyors, as if such questions were of no concern to the architect. He is the responsible person who has to decide between the parties. If he is to advise his clients, and guard their interests, it will not do to seek shelter behind the flimsy assertion that he is an artist first and can only be expected to deal with business affairs as an after consideration. Architects in large practice possibly can afford, and must, to a certain extent, leave such things to subordinates, but when considering the question as to the grounding of students in the architect's business, we need to remember that they will have to commence at the foot of the ladder, and, necessarily, it will be a long while in all probability before they can act independently as masters of the situation in so complete a way as those who enjoy the privileges of being at the top of the tree. When the public realises that all the business associated with the work of an architect in respect to his buildings is personally his own the world will cease to cavil at our profession so frequently, and those architects who base their reputation on the determination of making their designs and details absolutely their own handiwork do more to elevate the calling of the architect and more to insure good building than is otherwise conceivable.

As architects we have more and more to attend to a considerable amount of purely business routine, and are expected to deal with highly technical problems not infrequently. We cannot afford to limit our vision from one point only, but have to look at our work all round. Builders are becoming gradually less and less trained operatives themselves, and they are largely assuming the position of financiers, conducting their business with a staff of departmental managers, who in any event are expected to show a profit in all trades. Do not misunderstand me. I know there are builders who are builders properly so called, with whom it is a pleasure to work, and all honour to them. But in many cases an architect can no longer rely upon the impartial advice of an experienced tradesman, and young architects have to confront facts as presented by the ordinary rough and tumble of the contract system, whereby, instead of the united efforts of all concerned being directed towards the best available result with the materials and funds provided, the opposing nature of the relative interests of the two contracting parties are now more than ever recognised and treated in an understood way as conflicting. From the commencement to termination of a job this influence is more or less evident, and naturally such a state of affairs entails much thought and no little anxiety on the part of the architect even if nothing more serious actually happens, a condition of things very probably insured by the fact that forethought has prepared for contingencies.

Considerations of this nature may be abstersive, and likely to be accounted tiresome in this place, but high art or no art, they do form part of an architect's business. Practical knowledge of this sort cannot be acquired in school classes, for office routine alone can really teach it. It is one thing to be taught carpentry or joinery in a polytechnic, where stuff is supplied without stint to practise upon, and quite another thing to go to work at the bench in a builder's workshop, as I did before I was articled. You are not long in understanding there, I may tell you, that material has to be handled and utilised in a business-like way. By following up this aspect of the matter so that materials shall be employed with a commonsense regard to workmanship, and thus reasonably adapting them as a means to a definite end, we shall invest our designs with truth of treatment and so go far to gain possibilities of distinction. Unless our multifold materials are employed expressively in an enlightened spirit by the workman there can be no sense of fitness and beauty in our buildings. The responsibility of providing for this expression rests now with the architect, consequently it is of the utmost importance that our students shall be trained in the theoretical and artistic, as well as practical, use of materials, not forgetting, of course, their structural nature and value, particulars about which every learner of building work ought to know. It has been suggested that by a befitting application of new materials a new

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style of architecture at no far distant date might result deserving to be associated with the Twentieth Century, but assuredly this cannot be expected because it is clear that materials can never alone produce either style or design. Brains are required to bring that about. Bricks and stone remain bricks and stone, iron and terra-cotta remain iron and terra-cotta until the architect can make them something else, till he imparts into their use a spirit of thought and vitality which constitutes all the difference in the world between the four square elements of a common piece of building and a living creation of art.

We are told that artistic fruition exists beyond the scope of a drawn design, which at most is a mere paper pattern suitable for transmission through the penny post, and, further, that the realisation of a building depends upon the millions of handstrokes of the artificer's work which consummates and brings the creation into shape. This sarcasm, so tersely expressed, might be partially true if we chanced to be employed in constructing Egyptian pyramids, but unless we wish to emulate the chaos generally associated with the prehistoric building of the Tower of Babel, we shall scarcely be induced to rely in these days solely upon the handstrokes of the British working man. Whatever theories we may indulge in as flights of fancy during holiday hours, for real work the student must take care that his own handstrokes shall be unmistakably based upon practical knowledge, particularly in making his working details, insuring their accuracy, and workmanlike thoroughness, in which every part of his proposed building is clearly worked out after the design as a whole has been drawn and thought over to a smaller scale. Such diagrams may be quite unattractive as drawings, and perhaps fragmentary looking; in some cases they will be left unfinished in pencil or chalk, and generally it will suffice to leave them uncoloured and not inked in.

The leading consideration above all things is the design itself, and to insure its proper execution everything from the outset depends upon showing what is intended with a well-defined precision, leaving nothing vague or undetermined, so that these details shall furnish an unmistakable guide to the quantity surveyor, the prime cost clerk, the foreman in setting out, the clerk of works, and all the trades engaged in the handstrokes of its execution. When the job is done these drawings form the basis of the settlement of accounts, and at times have to be used as evidence in arbitrations. This calculating consideration concerning contracting jobs is contrary to our artistic proclivities, and, if none of us would by choice select such commonplaces, there are architects who by bitter experience have found out to their cost the importance of giving these things more study. Whatever may have been the practice before vernacular modes of building died out, there is only one way now of insuring good building and artistic work, whether it is carried out under a schedule or contract, and that is by making working drawings such as I have described.

The collection of office drawings now on the walls of this room are the best illustration which can be given of what I am advocating, and if this exhibition brings home the lesson thus insisted on the object of our meeting will have been secured. I am not sure that some apology on my part is not due to my brother architects for recapitulating so many elementary and self-evident observations on matters which are familiar enough and ordinary, though in the making of architects I fancy it must be admitted they do not always receive the attention they deserve. The cynic has said that there are now no masters in our Israel, but whether this reflection is strictly accurate or not, these drawings, so kindly lent by some of the most accomplished architects of the day, demonstrate what studentship has done in their case towards a thoroughness of detail in producing buildings unrestrained by mere precedent or the concomitant mannerisms of past styles. We recognise in their work much to delight us, and the advantage of their example cannot fail to inspire us. It would be invidious to allude to any individual drawing or describe any work in particular, but I will venture this statement that five and twenty or thirty years ago it would have been difficult to bring such a thoroughly good and representative assemblage together as that which is gathered here to-day. My difficulty has been not so much in obtaining such drawings, as in deciding when to stop in inviting contributions for the exhibition, which had to be governed by the restriction of space.

Never before has skill in draughtsmanship of the right sort been more capable than it is at the present moment, and if drawing alone could insure good building, the architecture of the twentieth century would be of surpassing merit. Drawings necessarily only furnish the architect with his chief and indispensable "instruments of service," and unless he has intuitive taste and inventive capacity, the pen or pencil, however facile the hand may be, will not alone furnish him with ideas, or give him what is called "the power of design." The best architects take good care to have their designs well drawn, but I suppose no one realises more entirely the shortcomings of drawing than a good architect. After all, it is the building itself by which he must be judged. Few things are more deceptive than shadow-projected and worked-up elevations unless it be show perspective drawing, and particularly the accommodating pictures of the perspective expert. Sketches and exhibition draughtsmanship are most interesting and useful, but that is a branch of the subject with which we are not concerned to-night, and so for once the pictorial must give way to the practical.

In our consideration of working details the student must remember their eminently conventional character, and as such they fail to give the effect of the materials intended to be employed, while the arbitrary tintings, used to show the workpeople and measurers how the several materials come together, convey no guide to the determination of more than the most elementary and incomplete ideas of the architectural result as a work of beauty. The very lines which go to make up the drawing tend to mislead any but an experienced judgment. Thin lines make a design appear weak, and heavy lines give an undue importance to minor points, and by over-accentuating the jointing a fictitious effect is imparted. Burges once said in this room "we cover our drawings with such quantities of lines that we finish by deceiving ourselves as well as our clients." It is dangerous and unwise to depend upon our drawings unless we possess an intimate acquaintance with materials, and because so many have not cultivated this knowledge as they might well have done the failure of much of our modern work may readily be accounted for. The importance of texture is thus overlooked quite as much as a proper appreciation of scale and colour. The value of surface finish, too, befitting various materials, does not receive the study which ultimate good effect demands. It is desirable to think in the round and design in perspective with what has been called a modelling mind. Drawing in some degree may help us in this, but it cannot enable us to judge as to the weathering properties of materials or their liability to accumulate dirt, and no artistic architect will reckon such considerations as of small concern. They are indeed of the greatest consequence, sadly neglected as they often are, and that by some whose negligence would be least expected.

Then, again, if we become too much monopolised in the elaboration of drawings, we are apt to forget other more important matters, such as, for example, the necessity of employing, as far as possible, the natural local materials of the district in which we are called upon to build, so that our work shall successfully constitute an indigenous part of the crust and surface of the earth on which the users of our buildings live, and not remain a fabricated excrescence imported from elsewhere, or a toy upon the ground which, save for the need of someone's roof-tree, might, as Morris said, have remained a neatly-drawn design on the walls of some architect's office. Not only should we use the countryside materials to hand, but the type of design employed must befit the nature of the materials available, insuring in this way the charm of local colour. How frequently the reverse of all this is seen. For instance, mansion houses in the style known as "Late Classic" with porticoes to match, are imported to moorside sites and worked out in coarse millstone grit, which before long inevitably resumes its rocklike character; or, to mention another analogous absurdity, you will come upon neat, smug-looking, whitened, rough-cast houses roofed with green Westmorland slates in the heart of Sussex, where flints and red bricks and sandfaced tiles or Horsham slabs abound. Precisely the same patterned houses, green woodwork, red curtains, and "tallboys," can be seen away down in Dorsetshire or up in the Wolds of Yorkshire, suggestive of the equally arty picture post-card, produced and inexpensively distributed with like facility, on the principle of the "Penny plain and twopence coloured." It is this sort of thing which furnishes an excuse for the taunt that we are only "paper architects."

There were, of course, no splendid draughtsmen in the thirteenth century when draughtsmanship was very fragmentary and indifferent; and, for that matter, we also must admit that in all probability a vast number of beautiful buildings all over the land were put up without any architects at all in the now understood annotation of the term, "when the roughest draughts possible were made out for these buildings, and they grew up simply without any intermediary between the mind and the hands of the people who actually built them." There were no polytechnic professors or art lecturers either in those days, and no plethora of books or log-rolling critics to surfeit with commentaries the fringe of art. Professional journals then did not exist, neither did assessors nor competitions! Things have changed, and the causes are various, but it is pure affectation to run down good drawing which does not constitute paper architecture, neither is it at all probable that a man who is workmanlike enough to draw well will be content to build badly. Work has now to be carried out under a totally different set of circumstances. The arbitrary and so-called economic divisions of trades, the principle of contracting and sub-contracting, the consequent prevailing deterioration of interest in the work itself for its own sake, and the degenerated minimum yield of labour in return for the maximum amount of pay procurable, present the mercenary and rotten ideal which unfortunately dominates the current labour market of what is called skilled handicraft. The consciousness of self-dependence and the habit of individual judgment possessed by vigour of character under such environment must be well-nigh impossible. When craftmanship flourished "dumping" was unheard of, and labour questions had not been exploited by big capitalists on the one hand, and by paid agitators on the other. Workmanship, in consequence of big factories and huge combines, has become divided and subdivided in rigorous subordination so completely that the worker instead of knowing his work from start to finish now takes his place only as part of a gigantic machine, plodding on with brainless indifference at a set of unvarying details turned out by the hour or by the piece. Prices are settled at a fixed and uniform consideration in cash according to amalgamation rules formulated, irrespective of good workmanship, as such, by vicarious directorates, who assume a convenient ignorance when employés are underpaid or the employers cheated, finding an excuse by reference to the sum of dividends obtainable. Trade unionism became a necessity, but by doing nothing or next to nothing to insure a tradesman being a skilled workman at his trade barren badness now passes muster where honest impartiality ought to exclude such rank incapacity.

The building trades are hampered in every direction by labour questions, which thus tend to make individuality and personal excellence an exception rather than possible. For these and other reasons the architect's position is assuming an increasingly essential factor, at least in the character of overseer, in all building enterprise where efficiency and economy are provided for. In further ways, too, the scope of the architect is growing in importance. Though our relation to craftsmanship is entirely changed, many advantages no doubt are available to the profession never dreamt of by our predecessors, even if they cannot have known the pressure of competition as we do. Slipshod architectural pretensions no longer will serve; let us hope they have had their day, and, so far as in us lies, we must endeavour to make it as difficult as we can for the charlatan to exist any longer on unqualified ineptitude or on borrowed plumes, till he has become as extinct as the Dodo. By insisting on efficiency, our scheme may, in a sense, be termed aggressive on the principle characteristic of Nehemiah, who built with the sword in one hand and a trowel in the other. Our indubitable source of strength must be looked for in equipping ourselves for the occasion and by graduating for the work which the public has in store for us to execute, remembering that success will be attained "much less by extraordinary intellectual gifts than by an extraordinary strength and tenacity of will, by the abnormal courage,

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perseverance, and work power that spring from it, or by the tact and judgment which make men skilful in seizing opportunities, and which, of all intellectual qualities, are most closely allied with character." Prating plausible platitudes about high art or the commonplace of the need of industry will furnish no excuse for not providing adequate training for our pupils, or for failing, any one of us, to do our very best:—

> Thy purpose firm is equal to the deed;
> Who does his best his circumstance allows,
> Does well, acts nobly; angels could no more.

Miserable failures may be met in every walk of life protesting that they have done their best. If so, they display a sorry lack of method in the doing of it, and anyhow, while loitering in the encumbered lane of mediocrity, have missed the only high road to the market-square of success. This road is called "efficiency," thence alone leads the narrow path for the few destined to tread the pleasaunce of Fame, peopled only by those who really did their best.

Towards the close of last year all Italy was celebrating the centenary of the great Italian poet Alfieri, who rejuvenated the literature of that country through his tremendous influence on the life of his people. His abilities were seconded by a determination to be satisfied with nothing short of his very best, and thus it was he rose to fame. His first play gave him so little satisfaction that he *rewrote it three times throughout* before it was ready for the stage.

When Mr. Edwin Austin Abbey painted his famous picture of the Trial of Queen Katherine, it took him many months of hard work, and when the painting was finished people praised it as a masterpiece. The painter himself was not so satisfied, because to his critical eye the red of the Cardinal's robes looked a shade wrong. No one else suggested this lack of harmony in the colouring, but although the picture was completed Mr. Abbey thought it could be improved, so he set to work with his wife and servants to scrape away all the offending red from the canvas, a process which occupied six hours. The artist then repainted the costume of the Cardinal and so finished his picture, furnishing us with another notable instance of unqualified resolve to secure the very best.

Literature, science, and art afford other like examples, while commerce, politics, and the arts of war furnish the page of history with pictures of men who did nothing short of their utmost and their best. This resolve to do one's best is not incompatible with the natural distaste for the competitions and contentions of life which so many really artistic men feel. The impulse of ambition holds with such a secondary place, and it is not always the strongest man that is the most ardent climber. To not a few the tranquil valleys possess a greater charm than the lofty pinnacles of affairs. We can never grasp the sources of another's inspiration and, whether we are most influenced by the past masters of our art or rely more on our contemporaries, their influence can only fructify by our own unaided effort. Pugin influenced a generation, and thanked God he had been permitted to see and study the eastern transepts of Beverley Minster. Who does not remember the inspiring force of George Edmund Street, and who of all of us acquainted with the charm of John Dando Sedding's personality can ever cease to be thankful for his Heaven-sent enthusiastic fire? No ghost was secreted in his office; he did his work himself and rejoiced in the doing of it, consequently his buildings are full of interest and always repay a visit. Few architects can draw the figure as William Burges could. Go to Studley Royal and you will not fail to be impressed by his ornate, Frenchy-Gothic church, built there for the Marquis of Ripon, standing at the top of the noble avenue and terminating its vista. Notwithstanding its suggestion of exotic origin, always evident in Burges's work, all sense of incongruity is dispelled by the individual personality which distinguishes the design in all its parts down to the smallest detail. Refined taste, exquisite figure work, and a free play of fancy within and without, is the result of loving study ungrudgingly bestowed, leaving no doubt whatever as to Burges having done his very best. Compared with Fountains Abbey hard by in the same park, this florid little church necessarily takes a minor place, and in this comparative respect he had unquestionably an extremely difficult task. None the less, because of its force of individuality, the building holds its own, leaving a lasting memory of undeniable excellence and recondite iconography. John Loughborough Pearson's work delights us just the same. He told me he would rather carry out one building in this thorough manner than be employed on half a dozen which he could not personally work out in detail himself. You have only to look at his buildings from St. Peter's, Vauxhall, onwards in point of date, for the best evidence of his skill, unsparing industry, and artistic sincerity. Street, his personal friend, trusted to no other hand than his own in the drawing out of every feature of his designs, and it is well known that he modelled some of the ornament in clay for the carvers to work to at the Law Courts. As a draughtsman he was a master among the few of his time.

> His armour was his truest thought
> And simple truth his utmost skill.

The Gothic revival may be dead so far as the style of contemporary work is concerned, but it undeniably influences the present generation of rising architects in ways not exactly apparent on the surface of things, and so long as the buildings of such men as I have named exist their work will live. The same is true of Nesfield and Bentley, and, in the making of architects, do you not think that the skill of Teulon, Butterfield, and James Brooks as well as George Gilbert Scott, jun., will furnish fine object-lessons in the future? Their work contrasts with that of the famous Sir Gilbert Scott, whose establishment at Spring Gardens furnished the most notable example of the possibilities of work carried out under wholesale conditions. With such a number of commissions it was impossible for the principal to draw out or even know about some of the designs issued from his office, consequently the work bearing his name is unequal, distinctive in one instance, and failing in interest in another. The pick of the succeeding generation of architects furnished his staff, though it cannot be said that their master founded a school. His R.A. lectures on the development of the Dome and Gothic architecture rank among the best scholarly attempts to further the making of cultured architects, and he was the real founder of the Royal Architectural Museum.

The purport of this retrospective glance in connexion with the show of working drawings hanging on these walls, is to direct the attention of some of our younger members to the necessity of their doing what the up-to-date student of thirty years ago did in measuring up old work of pure architectural merit. The battle of the styles has ceased to interest people, and very few at the present time show any real interest in mediæval architecture at all. No one hardly takes the trouble to draw or study it. This is a great mistake, for it is no use depending on the photographic camera, which in some ways is so helpful and in others so harmful in the making of architects. One drawing thoroughly made for study is worth any number of snapshot prints. Students will never graduate as architects on photography. The authors of the detail drawings collected here to-day learned their business by personal familiarity with the buildings they studied, and the knowledge they acquired was the result of drawing old work on the spot.

Tabulating dates, contrasting periods, and accumulating photographs, or filing illustrations of buildings may be a useful amusement enough in its way, though, as contrasted with the actuality of an architect's business in real design, leading strings of this kind seem more in keeping with the fumbling stage, which, if persisted in, slackens all energy, satiating the mind by analysis, that kill-joy so destructive of all possible dreams of beauty. By all your powers seek to gain a more intimate grasp of the spirit with which old work was inspired. By a loving and intelligent study of its structural design and aim a reflex of its vitality and charm may assuredly be caught, but before you attempt any process of dissection stop, for remember murder takes the priority of all dissection, leaving only the remains of death. Bleach the dry bones never so white, the spirit, which alone could make them live, will, by such inquisitiveness, be killed and lost to you for ever. If you would become familiar with the inherent beauty and motive of historic buildings learn more the why and wherefore of their local traditional differences and note how available materials influenced the work in different buildings erected under the altered circumstances of various times, exercising also an appreciative discrimination by which to avoid that which is only curious and strange. Leave for secondary importance that which has become interesting merely as archæological treasure, and by thus recognising the true essentials embodied in the plan and constructive design of old buildings you will find in them an unerring guide for the advancement of your art and subsequent designs. We need never hesitate to adopt as the basis of our own work that which has been done before, incorporating it as our own.

Those who speak slightingly of the so-called "Gothic Revival" do so with more assurance than knowledge, and are apt to forget what we owe to the writings of Pugin, Ruskin, and Morris, names which are severally associated with the succeeding phases of that movement. Doubtless, the rising generation enjoys many advantages unknown to those who preceded it, but I sometimes think it might be useful to remember with what intense love of their work and with what enthusiasm these Victorian mediævalists carried out their undertakings. It is also wise to recall, too, occasionally the day of small things. For instance, it was in an old shambling cock loft located in an obscure slum almost on the mudbanks of the Thames that Ruskin, Cockerell, and Beresford Hope held crowded audiences in rapt attention while they lectured on the charms of Gothic architecture midst the self-same collection of examples and casts which now have been inherited by the Architectural Association. Many years since, in Oxford, at a meeting held in that university for furthering the erection of perhaps too ambitious a group of educational buildings, Max Müller recalled the fact that "great things had often been done in hovels." William Burges, thirty years ago, when the Architectural Association was by no means so important a body as it is to-day, called it "the life-blood of the profession." Our society is going stronger than ever, and you will need perhaps little imagination to picture to your minds with what generous zeal Burges, Street, and their contemporaries of the mediæval school would have gathered round in active support of what we are endeavouring to accomplish at the present time. I am well assured that Brydon and Sedding, had they been with us too, would have shown no slackness in helping our project on. Such names as these from the immediate past are names to conjure with, for the mere retrospective thought of their enterprise at once invigorates our enthusiasm and animates our determination.

To what extent this educational scheme may be developed it is impossible to foretell, but friends have not been wanting in ambitiously advocating the founding of a "National School of Architecture." It will be hardly worth while to battle over this nomenclature question. Provided better architecture is the resultant, it is of no consequence whatever whether the school which insures such improvement be "National" or not. Personally, I doubt the principle of attempting to produce either good painters, sculptors, or architects in any strictly Governmental School of Art. I need not dilate further upon that matter, but it appears to me that the wiser plan must be to retain the control of art occupation teaching as far as possible in the hands of those who practise the particular arts in question, working, as far as circumstances will allow, on the lines of the historic art workers' guilds. Academical architecture appears to many as synonymous with a *caput mortuum* of pedantry and formalism, so fatal to living art and out of accord with the ends we have in view. To justify this effort the work in itself must be worth the doing. Academic architecture cannot serve, examinations in artistic qualifications are out of the question, and Registration, after all that its advocates may urge in its favour, would inevitably fail as a guarantee of artistic ability. Education, even when based upon a unified system of technical training such as we are advocating in accord with university teaching, can but do little in the absence of a nascent fitness on the part of the pupils in so far as architectural design is concerned. To sum up, therefore, the whole matter may be said to be embodied within the scope of the quotation with which I propose to conclude. The paragraph itself, however, must be read in the light of the educational advance which has been inaugurated since it was originally written: "The aim and object of an architect is to *build* beautifully—this is, of course, including conveniently—for a building that is beautiful but inconvenient and unsuited for its purpose can be of no permanent interest or value. . . If he sits in his office making picturesque drawings he may be an accomplished draughtsman but he is not an architect. If he spends his time chiefly in calculating the smallest amount of material that may be used in walls and girders to give a

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required amount of stability, caring little or nothing about its design, *i.e.*, 'architectural construction,' he may be an engineer or builder, but he is not an architect. . . Architecture is on precisely the same footing as painting and sculpture. A man must, beyond all doubt, be endowed by nature with the special gift; *that* he cannot acquire any more than people unendowed with the necessary gifts can expect to become painters or sculptors; but supposing him to have by nature the art faculty, by the exercise of very ordinary industry and study he can with certainty attain to excellence in what we maintain to be an equally necessary part of his work—namely, skill in purely practical details of construction and arrangement. . . We maintain that, in a complex art like architecture, a full knowledge of materials used in carrying out work and of all modes of construction is absolutely necessary; it is a mere waste of time to dwell incessantly and almost exclusively on one part of our work only, for without this knowledge an architect cannot claim to be an architect at all—he would be the merest amateur. Nay, more, we hold that no good architecture ever did exist, or ever can exist, apart from sound construction; good construction always has, and always must, go more to influence design than anything else; in short, it is the root and foundation of the whole art, from which all styles and all modes of good building have always sprung."

Mr. W. H. Seth-Smith, in proposing a vote of thanks to the lecturer, said the paper, on a subject in which he took a great interest, was very comprehensive and was full of truths very well expressed and very well read. What did it all come to? This, he thought: They must, if they were ever to inspire the public with a knowledge that architects were members of a profession and were worthy of employment, show that they knew their work thoroughly. It was most desirable that architects should be trained men, and that that training should be both practical and artistic. He did not intend to discuss what that training should be; he thought they could safely leave that to the authority which the Institute was endeavouring to create, which would be thoroughly representative and highly qualified for educational advice. That body might advise a combined scientific and artistic training, but in any case science and art must not be divorced in any system adopted. They must feel that it was absolutely essential to keep the training of architects—and the examination, too, for he believed that examinations were the only way of testing whether a man had had any training—in the hands of the profession of practising architects; that any curricula which might be laid down should be drawn up by architects. The Association was an excellent training school, and the Institute should be an excellent examining body—certainly the only body they could expect to do the work in the best way it could be done. The Institute's present examination might not be perfect—but he must not go into that When this board of education got to work it must lay down the best system—whether the system was to be more academic or more practical, or a combination of the two, must be left to it. He was glad to hear Mr. Adams say that what was wanted was more brains. It seemed to have been the belief in certain directions that an artist did not need brains; that somehow an artist could do his work without; but the truth was that in no work or profession did men need brains more. Without brains and culture they could not properly embark on their training as architects; and that seemed to be one of the leading points in the Association, for they believed that in the Day School they could give a man a chance of deciding whether he had the capacity for learning his art.

Mr. W. D. Caröe, in seconding the vote of thanks, said he thoroughly agreed with Mr. Seth-Smith as to the fulness of the paper—in fact, he did not know of any subject of architectural education which Mr. Adams had not touched upon. There was reading for hours in the paper, and there were texts for innumerable sermons, and as he had not previously read the paper he felt unable adequately to discuss it. There was one point he could remark on; not only in the paper, but in the drawings on the walls there was some absence of what he might call plan. In his opinion, the beginning of great architecture, so far as one knew it in these complicated days, and so far as we had to practise it, existed in plan, and, as was shown in Mr. Adams's last quotation, we could not even be artistic unless we planned in an artistic and convenient way. He would have liked to have seen on the walls a few more plans, and to have heard Mr. Adams impress on them a little more than he had done, the advantage and necessity of planning as a foundation of great design. That, no doubt, was one of the matters which, perhaps, could hardly be learnt; it must be inborn, and it separated the sheep from the goats to a large extent. There was another point, which Mr. Adams had mentioned, which he (the speaker) would like to emphasise, and that was the extreme importance, in these days of easy transit, of not misusing materials. In various districts we saw springing up around us an enormous amount of building, not only in the towns but in country places—in little country villages, where one would hardly have expected it—cottages, schools, institutes, etc., were being erected, and it was nearly always the case, he was sorry to say, that the material used was one that belonged to another part of the country. He wished, therefore, to impress on the growing generation of architects that there was nothing more important than to use the materials at hand, and to forget, so far as architectural matters were concerned, that railways existed at all. If that were done, and if materials were used in the spirit of the neighbourhood where they were found, they need not be afraid of modern architecture spoiling a neighbourhood, and they might even welcome the modern garden city. He wished to refer to the excellent words Mr. Adams used on the general subject of education, and especially on the subject of registration. He (the speaker) did not intend to enter on that knotty subject in any polemical spirit, but he must say that, in the making of architects, if there were two fallacies they existed—he was sorry to disagree with Mr. Seth-Smith—in the two words registration and examination. In nearly all the bodies which controlled the professions—it was certainly the case, also, in the Universities—there was a general uprising, he would call it, against an abject system of examination as a test of knowledge, and he believed that one of the causes of the success of the Architectural Association was largely due to this, *i.e.*, that in the past they had eschewed examinations; and he hoped they would always do so, because he was sure that examination, especially when it touched on anything in which the imagination was concerned, was an absolute mistake. A man's imagination or depth of thought could not be examined.

Mr. Walter Millard said it was impossible to discuss the paper in a short time. As to the title of the paper, he was inclined to think that the making of architects was a branch of the business of the making of men. In all professions men had to be trained and brought out—made the most of; and in the making of architects that had to take place. As they grew up they were more inclined to take long and broad views of how architects should be trained, but it would not do for those who had had a few years' experience to forget the student's point of view. It was well for them to go back to the time when they were students, and remember what they themselves thought about their training. The student took short views; he did not look far ahead—just a year or two—but what he thought was worth consideration when they were planning grand schemes for educating the whole profession. What the student cared about was not the general effect upon the profession as a whole, or anything of that sort. The utmost even a fairly good man wanted was to learn—not necessarily for the mere love of learning, but so that he could turn that learning to account. Probably the student wanted to get into a good office—that was one of the early desires of a young student, and he wanted to be told how to do things and learn things, because that would help him immediately—for one thing, help him to get a good berth, where he could work alongside of good men who did good work. Even if a man had no ambition of this kind, he wanted to be helped to get a good salary—though "good" in this case did not, perhaps, mean more than 30s. per week. These were some of the immediate objects of students, and more would be done with those students if they were helped in their objects and aims. If they wanted the student to wish and seek for something more, they must help him first to realise his immediate wishes. Help him in his aims, and you may be privileged to lead him to higher aims. When a student was in an office, what could be done to help him get into a better one? One thing was to teach him to draw, and so make himself useful to someone else. Another thing they could do was in the way of offering of prizes. There were many prizes offered to students, but there were not enough, and he would like architectural students to have a chance such as students for the Bar had, *i.e.*, to win a studentship that would secure a premium to be paid to the principal of an office selected by the student himself. Studentships were offered in the case of the Bar which entitled the winners to have the value of the studentship paid to any barrister he might wish to read with. In the case of the architectural profession more than one studentship of the kind would be necessary—perhaps a dozen would be required; and if there were these prizes there would be something for a student to aim at, and that would help him a good deal. All the students who might compete would not be successful, but that would not matter, for those who tried would be benefited. It was an excellent thing to be with and to work alongside good men; and though that could be obtained now in the Royal Academy schools, that was only evening work. If a student got into an office where there were picked men it made a difference to his whole life, and if he had that object and chance in early life his aims were different from what they might otherwise have been. It was most desirable to get hold of students early in life, for it was little use thinking of what could be done with a student later on in life unless they could influence him in his early student days. It was necessary to make a man grow, and many men missed finding out what they were really capable of because they were left too long to themselves. If a man were studying architecture in order to become an architect, it was no use for that man to think that he could confine his work and studies to office hours, or to the mere reading of books after office hours. His idea of the method of study of an architectural student was a parallel of the method of study of the medical student. Let them ask any medical student where he would be if he tried to study anatomy from books and diagrams only, and did not dissect. The first thing an architectural student should be set to do, it seemed to him, was to study a building—not merely the drawing of a building, but an actual building; as simple a building as they liked and of any period—and to thoroughly study and understand it, as no amateur could; and not merely to photograph it, as any amateur could, but to get hold of it, as an architect should, by measuring it, drawing it to scale, and by examining it in every way inside and outside, and learning all there was to be learnt about it. In that way a student would get a method of study applicable to all buildings of all styles and all periods. Whether the student had any preference for buildings of one period rather than another was a secondary matter, for he would have learnt how to study a building as a building, to dissect and analyse it for himself. That should be the method from the first, as soon as a student had learnt to make a geometrical drawing and to understand what was meant by plan, section, and elevation. That, of course, would lead on in later times to studying buildings of particular times and periods. It had been suggested to him, within the last day or two, that some of the Academy, the Institute, and the Association competitions might be made more use of if the winners of the prizes were set to do a certain series of buildings, and in such a way that they would be useful as records and studies; and that the whole country might be mapped out and an archæological survey of buildings be made by degrees. He wished to endorse what Mr. Seth-Smith had said in one respect: Architects should keep in their own hands the training of their own recruits for the profession. The question of recruiting was a vital one to any profession—upon what recruits were enlisted and upon their subsequent training—and he hoped that it would never get out of architects' hands into the hands of others—the Government or rate-supported authorities. Architects should see to the training of pupils, for none but architects knew how to produce architects. Each profession ought to be responsible for the training of its own recruits, and the

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architectural profession had hardly yet risen to a full conception of their collective responsibility for the education and development of the rising generation.

Professor Simpson, in supporting the vote of thanks, said there was so little time left for the purpose of discussion that he would not make many remarks. Mr. Adams had said that a school should be an "occupation" school, which he (the speaker) took to mean that the school should be such as could train a student for the occupation which he was to follow—in other words, that the school should be essentially practical. That, he took it, was the thing to bear in mind in any scheme of preliminary education which was started. Whatever was done must be on practical lines, and be such as was suited to the conditions of everyday life, to the work we are called upon to do now, and that it must not in any way attempt to revive methods of teaching which some hundred years ago were satisfactory, but which were satisfactory under the then conditions, which had since totally changed. Any scheme of education to be practical must be broad and liberal—broad in the sense that it should include practically everything that a student required to know. That was rather a large order; he meant that, as far as it was possible, it should be based on those lines. It was curious how fashion changed. It was not so long ago since it was stated that the first essential for an architect was drawing, the second was drawing, and the third was drawing. Nowadays they were told by some that the first essential was building construction, and the second and third were the same. No doubt building construction was the first essential for an architect; at the same time drawing came second—and when he said drawing he meant drawing, and not draughtsmanship, which was a different thing altogether. The training of the student's hand and eye by means of hard and systematic drawing—from the antique, the life, etc.—enabled him afterwards to express his ideas without being hindered by want of technical ability. Although he said building construction came first and drawing second, still, the first essential for an architect was imagination. An architect needed imagination to conceive; then he needed a knowledge of building construction in order to carry out his ideas, and a knowledge of drawing in order to express them properly.

The Chairman, in putting the vote of thanks to the meeting, said they had had a very interesting paper, and he thought they would go away with more ideas than they came with. Not only had Mr. Adams told them what they should do, but he had told them a good many things they ought not to do. He desired to say how much the Association was indebted to Mr. Adams for what he had done in connexion with the transfer of the Architectural Museum in Tufton-street to the Association, and no one who had not been on the committee of the Association or the Museum could realise how much Mr. Adams had done for the Association in the matter.

The vote of thanks having been heartily agreed to,

Mr. Maurice Adams, in reply, said that if one young student went away impressed by the necessity that he individually was the person that was going to make himself a success, anything he (the speaker) had said would not have been in vain. It was little use a student depending upon other people. How could half, or a quarter, or an appreciative number of young fellows who entered the profession ever hope to get into a leading architect's office? Only a very few could hope to be so fortunate; and, strange to say, the best men—very often the most successful men—came up from the country, where they hardly had any advantages at all. It was not so much the number of advantages a man had, but the way he made use of those he possessed. He feared he had made his paper rather long, but he thought it was an opportunity he might not have again for furthering the object he had in view when he assisted in giving over the Architectural Museum to the Association, and he wanted to make the movement, which they were now occupied in, as thorough and as far-reaching as possible. He entirely appreciated what Mr. Caröe had said as to plans; no building could be a success which was not well planned. In conclusion he desired to move a hearty vote of thanks to those to whom he was personally largely indebted for lending drawings for the occasion. He never saw a better set of drawings, and they were deeply obliged to the owners for lending such drawings, many of which were of great value, as illustrating works in progress. Those drawings had largely contributed to the success of the evening.

The vote of thanks having been very cordially agreed to,

The Chairman announced that the next meeting will be held on February 5, when Mr. W. A. Harvey will read a paper on "Cottage Homes."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

I.—ROYAL FRIENDLY SOCIETIES' BUILDINGS, FINSBURY SQUARE.

IN thick foggy weather the first spring visit of the current session was held on Saturday, January 23, at the new buildings of the Royal Friendly Societies in Finsbury-square. Although the premises are yet enveloped in scaffolding, the members of the party, numbering about fifty, had a good opportunity of closely examining the Portland stone and Cornish granite materials which are being used in the façades. Mr. John Belcher, the architect, telegraphed his regret at being unable to be present, but hoped to welcome the members of the Association upon a future and more suitable occasion. In his absence Mr. A. H. Belcher conducted the party to the various parts of the building and explained the plans.

In our issue of May 16, 1903, we published a perspective view and plan of the design, together with a reference to the purposes to which the buildings will be put. In the immediate neighbourhood there is another large new building—Electra House, views of which we recently gave in our New Year number—which is the work of Mr. John Belcher, and offers some comparison with the structure now under consideration. The materials used in the fronts of both works are identical; but whereas granite is employed in one story only of the older building, two stories at least above the street level will be built of that material in the Royal Friendly Societies' head offices. The premises now in course of erection occupy a corner site. The dominant feature will be obtained from the important treatment of the angle, which rises into a kind of octagonal tower; the principal front, however, will face Finsbury-square, where the Board Room and more important departments of the offices of the Societies will be located. The City-road elevation will be made somewhat irregular, owing to the compulsory setting back of the various stages on the north boundary to avoid infringement of the adjoining rights of light.

The new fronts have not reached their full heights, so that the day of the visit was too early to obtain impressions of the final effects. It was pointed out that asphalte roofs will be used, and that an important part of them will be finished with vulcanite, upon which will be laid out a roof garden for the use of the staff in the Societies' offices. A recreation room will also be provided. Shepwood patent bricks, both for plastering upon and for glazed finishes, are being largely used in the construction of the office partitions.

THE SURVEYORS' INSTITUTION:

GARDEN CITIES.

AN ordinary general meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, Mr. A. Buck, President, in the chair.

Mr. Rogers, Secretary, having read the minutes of the last meeting, which were confirmed,

Mr. Percivall Currey, Hon. Secretary, announced some donations to the Library and the Library Fund. A vote of thanks having been accorded to the donors,

The Chairman said that Mr. Ralph Neville, K.C., had prepared a paper entitled "Garden Cities as a Method of Industrial Distribution," but he was not well enough to be present to read it himself. The paper, therefore, would be read by the Secretary.

Mr. Rogers then read the paper, which dealt with the objects of the directors of the First Garden City, Limited, the name and idea for which were due to Mr. Ebenezer Howard, the author of a recent book on the subject. The scheme simply aims at stimulating and organising the movement towards the decentralisation of manufacturing industry which is observable in various quarters. The endeavour was to facilitate the distribution of the industrial population upon the land, and the action of the Association was prompted by the belief that physical degeneration among the population of our great towns must be recognised as an existing and pressing evil. He thought that this degeneration was so generally recognised that he might fairly proceed on the assumption that it exists, and he thought that there was a consensus of opinion that the progress of physical degeneration was identified with the increase of the population of the towns and the decrease of the population of the country, but as to the determining causes, which made town life unhealthy and country life healthy, there seemed to be, strangely enough, a divergence of opinion. Medical opinion was tardily beginning to lay hold of this vital fact that, no matter how satisfactory the conditions of life might be in other respects, it was absolutely impossible to rear and maintain a healthy race without an abundance of fresh air. It was not pretended that when we have provided a sufficiency of fresh air we have done all that is necessary. Some day we shall recognise the truth, which the Germans, in search of an object quite different, stumbled upon, *i.e.*, the effect upon national physique of sound physical training at the critical period of the lives of their young men. He did not despair of seeing a similar opportunity extended to our own boys.

Now, if physical degeneration exists, and we were agreed that steps should be taken to arrest it, what was precisely the problem we have to solve? He assumed at the outset a consensus of opinion identifying the growth of the towns and the depopulation of the country with the advance of deterioration. He had endeavoured to lead to the conclusion that the determining cause (or at all events that which transcends all others) was the insufficiency of fresh air in overcrowded towns. If this be conceded, it followed that either the towns must be so modified as to provide a sufficiency of air for the working class inhabiting them, or some means must be found of withdrawing part of the population to the country.

And first, with regard to the practicability of converting our great towns into places suitable for the rearing and maintenance of a healthy race. He would summarise the more important difficulties in the way. First, the cost was almost prohibitive; then, if that be overcome, the necessity arose of either heaping the working class in tenement buildings or scattering them far from their work. Mr. Scoble, in a paper recently read before the Institution,* had done well in calling attention to the mischief flowing from the adoption of the tenement system. A very large proportion of the tenements must inevitably be deficient in light and air, and in many of them artificial light was in constant use; but their chief defect lay in the tendency to keep the children within four walls and out of the open air. The tenements were very inaccessible from the street, or perhaps it would be better to say the street was very inaccessible from the tenements. Now we speak, partly sympathetically and partly reproachfully, of "gutter children"; but it was a mistake to suppose that their connexion with the gutter was the chief ground for commiserating their lot. On the contrary, when seen in the gutter, these children, sad as it was to say so, were enjoying the principal opportunity they possess for securing healthy development. The board school playgrounds should perhaps be mentioned, but he doubted if hygienically they were any better. With regard to the other alternative, distribution in suburbs, inasmuch as it was difficult to make factory work healthy, particularly in towns, what should be aimed at was, by securing healthy conditions of life during leisure hours, to counteract any deteriorating effects which might prove inseparable from work in the factory and workshop. Long journeys to and from work were not only exhausting, but were almost invariably performed under conditions quite as unfavourable to health as those which obtain in the ordinary workshop. What a man wanted to enable him to make the most of his life was to be close to his work and close to his opportunities for play or relaxation. Every possible inducement should be held out to the working man to spend the hours which were not devoted to indoor labour

* See our issue for November 28 last.

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in some pursuit which takes him into the open air. Another point to be borne in mind was this. Large aggregations of inhabited dwellings undoubtedly affect the atmosphere in a manner prejudicial to health. If we took a man from the centre of London, and put him upon the Surrey Hills or Sussex Downs, he was immediately sensible of an alteration in his physical condition. Now, the more we clear the centre of our great towns, and distribute the population in suburbs, the further and further off we drive the country, and the wider and wider becomes the thickly inhabited area. It therefore by no means necessarily followed that by spreading it out over a wider area we improved the hygienic conditions of the town as a whole. So far, therefore, Mr. Scoble and the promoters of the Garden City project travelled along the same lines, and arrived at the same conclusion, namely, that the distribution of industries in the country was the true solution of the problem of overcrowding and physical deterioration. When we came, however, to the question of what, if anything, should be done for the purpose of promoting such distribution they parted company.

The author then referred in some detail to the Garden City project, mentioning that the total amount of money found up to the present time was some 85,000*l*. To Mr. Howard belonged the merit of directing public attention to the desirability and possibility of making provision for the increase and overflow of the industrial population by:—(1) Acquiring sites for industrial settlements at agricultural prices; (2) Scientific planning of the sites by experts; (3) Concerted migration of population; (4) Limiting the area and population of these settlements; (5) Maintaining a belt of agricultural land around them; (6) Applying the increment in the value of the land for the benefit of the population. Here began and ended the connexion between Mr. Howard's book and the undertaking of the First Garden City, Limited. Mr. Howard provided his central idea with an attractive setting; with this the Company had no concern. Some of this might prove capable of realisation, some of it was very possibly fanciful, but the whole of it was expressly stated by him to be suggestive merely, and in his book he expressly said the final and actual scheme would be the outcome of many minds. The purpose of the Company was to proceed with the development of the estate in accordance with the best expert advice they could obtain, having regard only to the objects enumerated above. This was the attitude of the directors to-day. This has been the attitude of those engaged in the movement ever since he (the author) had been connected with it, and, to the best of his belief, it was the same from the very inception of the movement. Some of the advantages which might be expected to accrue from industrial settlements so organised were:—

1. Conditions of life for the artisan and townsman consistent with sound health for himself, his wife, and his children.
2. Cheapness, efficiency, and sightliness resulting from the scientific laying out of the town as a whole from the outset. In connexion with this head may be grouped:
   (*a*) The supply of light, water, power, and heat;
   (*b*) Facility of transit and communication;
   (*c*) Disposal of sewage.
3. The reduction of rates, by the application of the increment in the value of the lands, so far as it can be secured for the benefit of the inhabitants.
4. Bringing a market to the farmers of the agricultural land, and incidentally
   (*a*) Increasing the amount of labour employed upon the land by the extension of small culture;
   (*b*) Affording the agricultural labourer the advantages of town life.

If this scheme of industrial distribution were progressively acted upon, it seemed to him that the location of the population upon the land would have been started on the right lines. It would increase the value of land over a wide area, would maintain a greater number, probably double the number, of agricultural labourers, and would afford conditions of healthy existence to the industrial workmen. We speak of the over-population of England. The land would bear in health and comfort a far larger population than it holds to-day if the population were distributed in this fashion. The progressive depopulation of the country had long been bewailed. Numerous expedients had been suggested to check it, varying from the provision of travelling circuses to the imposition of protective duties; but in his judgment any attempt to force back the people from industry to agriculture by artificial means was foredoomed to failure. The tide of civilisation flowed in the same direction in all advanced countries.

The author then criticised at some length some of Mr. Scoble's conclusions. He agreed in the view that certain trades would be more and more drawn into the country, but he could not think the sporadic settlement of manufacturers was the true solution of the industrial question. There was no business in which co-operation offered so fair a field as it did in land settlement and the formation of towns. In this case there arose an advantage from the collective conduct of business, apart from that due to the conduct of the several businesses themselves. The mere resort of people to the same place, whether it be for the purpose of residence or of business, whether it be by individual selection or collective design, added a value to the land beyond its intrinsic worth. This increment had hitherto been uniformly presented to the landowner. By foresight and concerted action, it could be secured in great part, if not altogether, for the benefit of the people who create it. Moreover, in existing towns the inhabitants were in several ways exploited by private monopolists. Assuming management to be efficient in a town designed and managed in the interests of manufacture, where the return on capital was limited, as in the present case to 5 per cent., there must be an opportunity for a reduction of cost, which would place the manufacturer in a favourable position, not only in comparison with his rivals in great towns, but with those who had selected isolated sites for themselves in the country or near small towns. With regard to labour, too, and accommodation for labour, the advantages of co-operation and concerted action were distinct. The manufacturers to whom expenditure outside their business was immaterial were comparatively few. Certainly many of those who would be glad to move into the country were not prepared to build model villages or even themselves to provide accommodation for their work-people. Now, it was not easy to get builders to build cottages, the occupation of which depended exclusively upon the prosperity of a particular factory; whereas, where even a few manufacturers start together with the probability of an increase in their numbers, he did not think any very great difficulty would be found in procuring the erection of cottages, particularly where the landowner undertakes the capital expenditure with regard to sewering and road-making. Again, there was, he believed, always a difficulty about labour where local industries provide employment for men only. In the creation of Barrow-in-Furness it was found necessary, he had been told, to provide supplemental industries for the employment of women. On the whole, it was to be observed that the history of industry under the factory system indicated that towns were *prima facie* advantageous. It was only since the overcrowding of towns that the disadvantages had begun to predominate. The Garden City believed that they could offer land to the manufacturer upon terms which, having regard to the advantages offered, would be better than any which he could obtain from a private owner.

The history of industrial development in its effect upon the distribution of the population upon the land, did not teach the desirability in the case of a new departure, of leaving matters to self-interest and individual effort alone without foresight, co-operation, or organisation. If the development of the movement of decentralisation was left to chance, as the prime movement of centralisation under the factory system was left, we might anticipate with some confidence the growth of evils not less serious than those which the short-sighted indifference of our predecessors compelled us to cope with to-day. To the advantage of individualist effort he was quite alive, but the idea that this excluded the necessity for reasonable co-operation and organisation, he ventured to call individualism gone mad.

In regard to the site itself and its development, it was an estate of 3,800 acres, near Hitchin, on the Great Northern Railway. With regard to the area of the site, experience must show what was the right proportion which agricultural should bear to town land. In this regard it must be remembered that if the completed idea of a group of towns built on the like principle were carried into effect, the width of the agricultural belt surrounding each would be doubled. Personally, he should have preferred 6,000 acres, as originally suggested, but there is an old proverb that you must cut your coat according to your cloth. It was, of course, impossible that one site should afford equal facilities for all kinds of manufactures, but the company were advised that for general purposes the site was an admirable one. The preliminary work had been proved by experience to be much greater than one would have anticipated, but they had now every reason to believe that in a very short time they would be in a position to make a substantial start in the business of development. In regard to the question of the density of the population, it seemed to him that this might very fairly exceed what was to be found in a model village. The retention of two-thirds to three-quarters of the surrounding land unbuilt upon, would justify the erection of a fairly compact town, and compactness had of course its advantages, although everything must give way to sound hygienic conditions. There might be some temptation to create a straggling village, rather than a town; and by aiming to provide as much space round each dwelling as in a model village, and as many open spaces as in a model town, in addition to the open belt surrounding the town, they might provide several times over for the same thing. He thought, however, that the architects and others engaged upon the plans were fully alive to this danger, and he doubted not they would escape the Scylla of extravagant extension without falling into the Charybdis of overcrowding. With regard to land tenure, it was desired to depart as little as might be from conventional terms, the directors' duty to their shareholders and the inhabitants alike being to dispose of the building sites to the best advantage.

There was a point in connexion with the Garden City which should not be overlooked, and it was this: All that the company could in the first instance attempt was to provide for the laying out and creation of a town in accordance with the best conditions known to modern science; but there was ample scope for subsidiary effort to ameliorate the conditions of civic life. For such effort an exceptional opportunity was presented. From the very nature of the endeavour, a very much larger proportion of the inhabitants would consist of persons sincerely interested in municipal progress than could be found in other societies. He was fully aware that this was not without its dangerous side, but he trusted he should not be thought too sanguine when he said that the constitution of the board afforded a substantial guarantee against the undue influence of fads and fancies. The promoters of all reasonable schemes of social welfare, be they for model dwellings, workmen's clubs, co-operative enterprises, or what not, might be sure of sympathy and assistance from the company. The enthusiasm worked by a forward movement like the present was a great motive power, the effect of which could not, of course, be measured beforehand; but he should be much disappointed if the Garden City movement did not exert a great moral force and lead to considerable social improvement above and beyond hygienic questions, important and essential though they be.

Mr. Howard Martin, in proposing a vote of thanks to the author of the paper, said there could be no two opinions about the importance of the subject. From a London point of view, it was extremely important that we should diminish the constantly increasing pressure of immigration into London by inducing workers to carry on their occupations in the country, not only in order to stop the physical deterioration of the people, but in order to get land on which to build proper houses and factories at a cost which would not be prohibitive. He thought the ideal state of affairs was for London to become a distributing centre, and for most of the manufactories to be carried on in the country. One result of that would be that more people would be willing to employ themselves on the land. It was said that one reason why people came to the towns was the dulness of the country life; houses were bad and were distant from work, and the workers were willing to put up with the overcrowding, etc., of the towns in order to escape from the dulness of the country. If rural centres of work could

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be established, town workers would be brought under conditions which they preferred, but which were more healthy in every way. It was desirable to get more people to work out of doors, for it was that sort of life that made a healthy and a vigorous race. He thought Mr. Neville's paper would convince them as to the desirability of the scheme, but if there were doubts they would be as to the mode of carrying it out. He thought there would not be much difficulty as to the mode of disposing of sewage and as to lighting; such matters could be settled far more easily in a new town than in an old town, where there were all sorts of conflicting interests to consider. The great difficulty the promoters of this admirable scheme would have to contend with was in inducing individual manufacturers to move their capital and works, and transfer their labour soon enough to make the movement a success.

Mr. Wheeler, K.C., seconded the vote of thanks, and referred to the question of physical degeneration of large masses of the people, which was the most pressing question of the time. In Lancashire, the greatest manufacturing county in England, 49 per cent. of the class from which our soldiers were drawn were useless as soldiers. He did not agree with the author as to the unhealthiness of town life, except in crowded areas. The population of London for the whole area was actually sparse, *i.e.*, fifteen to the acre, and the death rate for the whole area was twelve or thirteen per thousand. That would compare favourably with any village in England. But these conditions varied greatly. The death rate of his own particular district was under ten per thousand, but within two miles of that area was an area where the death rate was over fifty per thousand. In his opinion this was due to the habits of the people. The housing question was only one phase of the matter. It was not merely a question of insanitation, it was also a question of the unwholesome habits of the people. The tenement system, on the whole, had been admirable, and the death rate, generally speaking, was a favourable one—distinctly good, when compared with the streets immediately contiguous. There were considerable drawbacks to tenements, but on the whole they were healthy, and so he was not altogether able to agree with Mr. Neville. He did agree with the author, however, in what he said about the undesirability of working people travelling long distances to their work; that did not conduce to physical improvement. In the garden cities factories would be close at hand, and that would be an advantage. As to sewage disposal, that would depend to a large extent on the local authorities, and they might insist on conditions which might add enormously to the cost of erecting the buildings in Garden City.

Mr. Ebenezer Howard said that in considering the health of a people they ought not merely to look at death rates. Were they not delusive? Might there not be a very low death rate accompanied by a very low standard of life? Was there not a great deal in what had been said about the survival of the unfit? In comparing town life with country life we had to remember that country life itself was often not nearly so healthy as it might be, because there were often not sufficient people in a particular district to make it feasible or possible to provide better sanitary conditions. Mr. Howard then described in some detail the Garden City project at Hitchin. The subsoil, he said, is chalk, and the upper soil is sandy loam. There is a good deal of sand on the estate; there is gravel, and in some parts a considerable amount of clay, and they had made some very good bricks, and hoped to make more. The estate was within the area of a profitable motor-car service. As to a water supply, their engineer had advised them that they would have a plentiful supply, as was proved by the bore holes that had been made. As to sewage disposal, no system had been settled on, but it was quite possible that at first some system of earth closets would be adopted; there was no difficulty under the Hitchin by-laws as to that. They had decided to have a system of gas-lighting, and a small gas-works would be started on the estate. They were very sanguine about getting manufacturers to bring their factories to the estate; several manufacturers were greatly interested in the scheme, and there was not the least doubt that a great many would take part in the scheme.

On the motion of Mr. Eve, seconded by Mr. Woodward, the discussion was adjourned, and the meeting terminated.

Examination Results.

Of the candidates who presented themselves at the Preliminary Examination of the Institution, held concurrently in London, Manchester, and Glasgow, on January 13 and 14, the following satisfied the Examiners:—H. G. Angell, Guildford; J. W. Balden, Dewsbury; H. C. H. Barnes, Wemyss Bay, N.B.; R. S. Bartram, Tonbridge; G. C. Baxter, Old Jewry, E.C.; E. G. Bigwood, Barnt Green, near Birmingham; A. G. Blackford, Ealing, W.; G. L. Broad, Lewes; C. G. Brown, Harefield, Middlesex; H. H. Buckmaster, Sloane-street, S.W.; W. G. Bulteel, St. Austell, Cornwall; F. C. Burbidge, Southsea; T. L. Butler, Weybridge; W. B. L. Butlin, Leamington; P. S. Byshe, Lewes; C. B. Callander, Warwick; G. S. Callf, West Ealing, W.; J. E. Carter, Brixton, S.W.; A. G. Carver, Upper Tooting, S.W.; L. E. Clark, Bromley; R. M. Clark, Dover; G. S. Conway, Gateshead-on-Tyne; G. Cook, Lye, near Stourbridge; J. R. Creasey, jun., Sidcup; S. G. Crockwell, Torquay; F. L. Crow, jun., Leigh, near Reigate; W. R. Darby, Notting Hill, W.; J. R. Day, Walthamstow, E.; M. Dixon, Lynsted, near Sittingbourne; J. D. Drew, Starcross; W. Durbridge, Bromley; G. P. Egan, Weston-super-Mare; F. L. Elmes, Canterbury; C. England, Bournemouth; R. T. Farmer, Chatham; H. F. Finn-Kelcey, Ashford; G. S. Ford, Melton Mowbray; R. E. Ford, Swindon; F. A. Fowler, Clapham, S.W.; A. W. Fox, Atherstone; B. Francis, Southend-on-Sea; B. K. Garvice, Bideford; W. Godfrey-Payton, Warwick; E. J. Goodacre, Hinckley; L. M. Grover, Camberley; H. L. Gudgeon, Tunbridge Wells; L. B. Gumbrell, Kingston-on-Thames; J. W. Haynes, Brighton; S. H. Heath, Westcombe Park, S.E.; C. M. Hennell, Kensington, W.; A. L. Hicks, Egham; C. F. Hodding, Salisbury; C. B. Holland, Bourne; H. A. Hosking, St. Germans; J. H. Hughes, Shortlands; E. C. Ingram, Sturminster Newton; G. M. Jeans, Milton, Marlborough; A. D. Jones, Chorlton-cum-Hardy; E. W. Kemp, Cambridge; H. B. Kennard, New Eltham; J. L. King, Stamford; S. King, Chatham; S. N. List, Croydon; A. E. Littler, Prescot; D. Llewellyn, Neath; V. F. Locke, Wolverhampton; H. V. Love, Southsea; H. V. Lynam, Newcastle, Staffordshire; F. M. Martin, Gravesend; P. Messenger, Guildford; L. P. Miles, Shortlands; P. C. Miller, Hoylake; F. J. Mills, Cheriton; C. Milnes, Birkenhead; E. W. Morgan, East Ham; H. R. Morris, Oxford; H. E. Noel, Ockham; H. C. Nutter, Cowden; T. A. R. Owen, Seaforth; G. H. Patey, Hampstead, N.W.; C. S. Patterson, Blundellsands; D. D. Pearch, Hastings; B. C. Pemberton, Rickmansworth; R. A. Purnell, Cheltenham; S. H. Ramsay, Herne Bay; W. L. Raymond, Child's Hill, N.W.; G. N. Reeve, Croydon; F. W. Robinson, Richmond; S. W. Ross, St. Albans; B. R. Sandwith, Reading; W. I. Shearburn, Dorking; G. G. Shone, Peterborough; W. Shovelton, Manchester; T. H. G. Stamper, Clapham Common, S.W.; H. S. Stevens, Colchester; S. H. *Stohwasser, West Hampstead, N.W.; J. H. Taylor, Hanwell; H. E. Turner, Ashton-under-Lyne; L. G. S. Ullyett, Leytonstone, N.E.; J. W. Vigars, Brecon; J. G. C. Wales, Portman-square, W.; W. Walkden, Alderley Edge; C. G. R. Weller, Crewkerne; W. A. Williams, Bath; A. S. Willmott, Ealing, W.; W. C. Wise, West Dulwich, S.E.; H. A. Wright, Warwick; and W. N. Wright, Woodford.

* Passed at head of the list.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A meeting of the Edinburgh Architectural Association was held on the 20th inst. in the Association Rooms, 117, George-street, Mr. A. Hunter Crawford, the President of the Association, presiding. The Chairman, in reporting upon a recent discussion at the R.I.B.A. on "The Statutory Registration of Architects," said he was sorry to observe that there was an inclination to take it for granted that they were all in favour of the movement. The best argument put forward in support of the proposal was that if there was a set of examinations it would necessitate everyone passing these examinations before being registered, whereas at present there are only the Institute examinations, which are of a more or less voluntary character. It was agreed that a Council Meeting be called for the purpose of considering the proposal. Referring to the question of public officials carrying out important architectural work, the Chairman said the case of the Usher Hall had aroused a good deal of feeling among the members of the Association, and the general question had been brought up at the last Council Meeting, when a committee was appointed to inquire into the matter and report. It was a thing they ought to put a stop to if possible. The Convener of the Special Committee had sent him a series of questions, and he (the Chairman) would be glad to have the assistance of one or two of the members in drafting replies. After the business had been transacted, Mr. W. Crum Watson, architect, gave a lecture entitled "An Architect's Holiday in Portugal." He commenced by making a brief survey of the history of architecture in Portugal. The earlier buildings in the country, he explained, were either from ideas brought from Galicia, or, as was the case at Alcobaça, designed on styles brought by the monks from France. In the early part of the XVIth century the Portuguese prosperity, resulting chiefly from the Indian conquests, brought about many notable additions to the architecture of the country, and the King added largely to Batalha, Thomar, and other places. At Belem, near Lisbon, Portuguese architecture reached the stage of its greatest elaborateness and richness, but after the Spanish Conquest in 1580 very little of any consequence was built. Mr. Watson afterwards described many of the principal buildings in the country, showing that much was borrowed from other countries, including India, and that in originality the tendency was towards somewhat extraordinary combinations. The lecture was illustrated by a large number of lantern slides, which showed the architectural features with great distinctness, and the majority of which had been made from photographs taken by Mr. Watson.

WOLVERHAMPTON AND DISTRICT ARCHITECTURAL ASSOCIATION.—The annual meeting of this Association was held recently at the Law Library, Lich-gates. After the business of the meeting the following officers were elected for the ensuing year:—President, Mr. F. T. Beck; Vice-President, Mr. W. Edwards; Council, Mr. S. H. Eachus, Mr. J. Lavender, F.R.I.B.A., and Mr. G. H. Stanger, F.R.I.B.A.; Hon. Treasurer, Mr. J. Harrison Weller; Hon. Secretary, Mr. W. J. Oliver, 1, Darlington-street, Wolverhampton; Hon. Auditor, Mr. A. Eaton Painter. The retiring President, Mr. G. H. Stanger, gave an address, reviewing the work of the Association during the past year. After the meeting, on the invitation of the retiring President and Vice-President, the members adjourned to the Star and Garter Hotel for dinner.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held at 32, Sackville-street, on the 20th inst., Dr. M. de Gray Birch, F.S.A., in the chair. Some curious books were exhibited by Mrs. Collier, including a small book of emblems, "Typus Mundi,' by John Cnobbarum, published at Antwerp in 1627. The illustrations are very quaint. "A Papist misrepresented and represented; or a two fold character of Popery," 1685; and a small copy of Milton's "Paradise Lost," 1711. Mr. Andrew Oliver exhibited some excellent photographs of an ancient font, unfinished, discovered buried under the flooring of the nave of St. Staughton's Church, Hunts. The Rev. H. J. Dukinfield Astley, Hon. Editorial Secretary, read a paper he had prepared entitled, "Portuguese Parallels to the Clydeside Discoveries," in which he dealt at considerable length with the very curious and puzzling discoveries made during the past year by Father José Brenha and Father Rodriguez among the groups of dolmens situated at Pouca d'Aguiar, Traz os Montes, Portugal. In 1894 the attention of Father Brenha was first directed to the examination of these dolmens, and he has, in company with Father Rodriguez, since systematically explored them. The whole province of Traz os Montes abounds in dolmens, situated for the most part high up in the mountains, the great number of them in a relatively small district, testifying, in Father Brenha's opinion, to the density of the population and its persistence in Neolithic times. These strange discoveries consist of amulets of stone, pierced for suspension, bearing cap and ring marks and ducts, which were found in a chamber which presented the appearance of having been the secret

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treasure chamber of the tribe, and with them were found four figurines representing females, one of which was egg-shaped, the lower part of the egg terminating in a male face. Besides these curious objects there were stones with rude drawings of animals, such as a horned rhinoceros, a reindeer, etc., and, more remarkable still, several stones with inscribed letters in a script bearing a close likeness to the script discovered at Knossos by Mr. Arthur Evans. It is, however, the finding of the amulets and figurines so closely resembling those discovered on Clydeside in the crannog by Mr. Donnelly and at the hill fort of Dumbuie that makes this Portuguese discovery so important in its relation to the evidence afforded by the Scotch examples of what would seem to have been a particular phase in the development of peoples in the Neolithic stage of culture in Europe. Dr. Birch, Mr. Gould, Mr. Forster, and others took part in an interesting discussion upon the subject. A second paper was then read by Mr. S. W. Kershaw upon "The Forest of Galtres," one of the most extensive forests in England, comprising over 100,000 acres and containing over sixty townships, which remained a Royal forest until 1670, when an Act of Parliament was obtained for its division and enclosure. Galtres was celebrated for its abundance of deer, and this district of Yorkshire was anciently known as Deira or Deerland. It was a hunting ground of Saxon and early Norman kings, but the former, after they had established their Heptarchy, seem only to have appropriated such lands as were unoccupied. The boundaries of Galtres are mentioned in the "Perambulation of the Forest," in the ninth year of Edward II., 1316. This document is preserved in the Record Office, London. Mr. Kershaw referred to several MSS. preserved in the Library at Lambeth which touch on the history of the forest in the early XVIIth century, amongst them being the "Shrewsbury Papers," seventeen folio volumes, which consist of letters written to or by several of the Earls of Shrewsbury, and from these he read interesting extracts relating to the government of the forest. The government of the northern forests, including Galtres, forms a distinct and very interesting phase of England's history.

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the Christmas recess was held on Tuesday in the County Hall, Spring-gardens, S.W., Lord Monkswell, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Greenwich Borough Council 824*l.* for purchase of borough hall (balance); Lewisham Borough Council, 1,868*l.* for paving and other works, and 2,250*l.* for contribution to cost of reconstruction of bridge; Stepney Borough Council, 2,883*l.*, for electric light installation; Bethnal Green Guardians, 2,000*l.*, for poor law purposes; and School Board for London, 200,000*l.*, for new schools, etc. It was also agreed to sanction the following applications: Hampstead Borough Council, 20,500*l.*, for erection of buildings for depot, etc.; Islington Borough Council, 3,653*l.*, for electric light installation; and Westminster City Council, 32,000*l.*, for purchase of site for housing purposes.

Long Grove Asylum.—The estimate of 6,550*l.* submitted by the Finance Committee for the erection of the fencing of the Long Grove Asylum estate, clerks of works, and contingences, was approved.

Direct Telephonic Communication between Theatres and Music-halls and the Fire Brigade.—The Theatres and Music-halls Committee recommended as follows: "That, except in those cases where direct telephonic communication with the nearest fire brigade station has been already established, a letter be sent to every licensee of every theatre and music-hall within the administrative county of London in which performances are regularly given, requiring him to at once take steps to place in direct telephonic communication with the nearest fire brigade station the premises for which he holds a licence."

The recommendation was agreed to.

Drury-lane Theatre.—The Theatres and Music-halls Committee reported as follows:—

We have recently received many letters of complaint as to the structural condition of Drury-lane Theatre, and the practice of standing in gangways being allowed by the management, and also complaints with regard to the seating arrangements in the stalls. The Council is of course aware that this theatre is what is known as a patent theatre, and therefore is not within the licensing jurisdiction of the Lord Chamberlain. So far as the Council's powers are concerned, we may remind the Council that a sealed notice, under the Metropolis Management and Building Acts Amendment Act, 1878, was served on the owners of the premises in 1895, and that, in view of the decision of Mr. Justice Channel, in 1900, in the case of St. James's Hall, it would appear that the Council cannot legally serve another notice under the Act above referred to, unless possibly in the case of further structural alterations being made by the owner. The only requirements, therefore, that the Council can legally enforce at this theatre are requirements dealing with fastenings to exit doors or gates and exit notices. The Council has power to serve a sealed order embodying requisitions of this nature by virtue of the 45th section of the Metropolitan Board of Works (Various Powers) Act, 1882, to which further reference is made below. It was found necessary, however, in 1901 to revise the regulations for the protection of theatres from fire, and all the old theatres, including Drury-lane Theatre, have been thoroughly examined since that time by the Council's officers, and suggestions for bringing the premises as far as possible into accordance with the regulations now in force have been formulated and sent to the respective owners. In the case of Drury-lane Theatre the suggestions were forwarded to the owners in April last, but so far no satisfactory proposals have been made by the directors for dealing with them. We are therefore of opinion that the premises in their present condition cannot be considered safe from the danger of fire. This unsatisfactory state of affairs is accentuated by the fact that the management of the theatre, without any authority from the Council, alter the seating in the stalls during the pantomime season (which seating, when arranged in the ordinary manner, is not as good as what is required by the present regulations) by putting the rows of seats closer together, and so greatly adding to the seating capacity of this part of the house. We have further to call the attention of the Council to the fact that on an inspection of the premises being made during a performance on the evening of the 8th January by one of the Council's officers it was found that the intersecting gangways of the gallery were entirely obstructed by persons seated on the steps, and that the outer iron gates leading to Russell-street were chained and padlocked, and thus the Royal and stalls exits, which deliver at this place, were rendered unavailable. The fastening was removed at once on attention being called to it by the Council's officer, but for such a defect as this a remedy exists, and we are strongly of opinion that this is a case in which the Council should serve a sealed notice under section 45 of the Metropolitan Board of Works (Various Powers) Act, 1882, with respect to the fastenings on exit doors, exit notices, etc."

The Committee recommended that a notice under the 45th section of the Metropolitan Board of Works (Various Powers) Act, 1882, containing various requirements, and specifying twenty-eight days as the time within which they are to be complied with, be prepared by the solicitor; that it be sealed in duplicate, and be served upon the person or persons by whom the premises are kept open for public entertainments.

Consideration of the matter was adjourned.

Lambeth Bridge—Ironwork.—The Bridges Committee reported as follows, the recommendation being agreed to: "The ironwork of Lambeth Bridge, as the Council is aware, is in a very unsatisfactory condition, and it has been found necessary to open up the lower booms of the main girders with a view to ascertaining whether it is possible to check the rapid deterioration of the metal. The estimated cost of this work is 150*l.*, for which provision has been made in the annual maintenance estimates. This can only be regarded in the light of a preliminary inspection, as, until the bridge is opened up, it is impossible to estimate with any degree of certainty the extent of the repairs which will be required. It is anticipated that, if the bridge is to remain open to traffic much longer, continual repairs of various kinds will have to be undertaken. We recommend that expenditure not exceeding 150*l.* be sanctioned for opening up and inspecting the ironwork of Lambeth Bridge."

Statue of King James II.—The Historical Records and Buildings Committee reported as follows: "The Council is probably aware that the statue of King James II., which, since 1897, had stood in the garden adjoining Gwydyr House, in Whitehall, was removed from that site in 1902, in connexion with the Coronation festivities. Upon it coming to our knowledge that the question of the site upon which it should be re-erected in London was engaging the attention of the First Commissioner of His Majesty's Works, we suggested, for his consideration, the desirableness of the statue being re-erected upon its last site in Whitehall, which, though in some respects not such a suitable place as its old site in Whitehall-gardens at the back of the Banqueting Hall, was, in our opinion, preferable, owing to the fact that it was more accessible to the public. The statue has, however, now been erected in St. James's Park, on the grass plot in front of the Admiralty Buildings. We report the facts for the information of the Council."

Thames Embankment Extension and Westminster Improvements, Re-housing—Millbank Estate.—The Housing of the Working Classes Committee recommended, and it was agreed, that Gainsborough, Wilkie, Landseer, Lawrence, Leighton, Turner, Romney, and Hogarth-buildings, Millbank Estate, be appropriated under section 4 of the Housing of the Working Classes Act, 1900, for the purpose of re-housing persons displaced in connexion with the Thames Embankment extension and Westminster improvements, under the powers of the London County Council (Improvements) Act, 1900.

Piccadilly, between Arlington-street and the Green Park.—On the recommendation of the Improvements Committee, it was agreed that the action of the Committee in arranging with the Westminster City Council to deal with the question of vaults to be constructed in connexion with the widening of Piccadilly between Arlington-street and the Green Park, and to undertake at an estimated cost of 1,600*l.* the paving and other works, be approved.

Having transacted other business, the Council adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parenthesis:—

Lines of Frontage and Projections.

Hampstead.—The retention of Nos. 4 and 5, Buckingham-mansions, West-end-lane, Hampstead (Messrs. Boehmer and Gibbs for Mrs. E. A. Cave).—Consent.

Wandsworth.—Buildings on the north-west side of Wimbledon-park-road, Wandsworth, eastward of "Allenswood" (Mr. J. M. Jones for the Land Development Syndicate).—Consent.

Kensington, North.—A porte-cochère at the entrance to the offices of the Clement Talbot Automobile Works, on the north side of Edinburgh-road, St. Quintin's-park (Mr. W. S. Walker for Messrs. Clement Talbot, Limited).—Consent.

Lewisham.—One-story shops upon part of the forecourts of Nos. 283, 285, 287, and 289, High-street, Lewisham (Mr. H. Bignold for Mr. H. B. Atkinson).—Consent.

Fulham.—Buildings on a site on the south-east side of Townmead-road, Fulham (Messrs. Humphreys-Davies and Co. for Messrs J. B. Lee and Sons).—Consent.

Hampstead.—That the application of Mr. A. E. Pridmore for an extension of the period within which the rebuilding of the "White Horse" hotel, Fleet-road, Hampstead, to abut upon Constantine-road, was required to be commenced, be granted.—Agreed.

Holborn.—A porch to No. 37, Queen's-square, Holborn (Mr. W. H. Ansell for the National Deposit Friendly Society).—Consent.

Lewisham.—A one-story shop in front of No. 135A, Sydenham-road, Lewisham (Mr. J. Benjamin for Mr. E. Clark).—Consent.

Lewisham.—Projecting porches to a terrace of twenty houses on the south side of George-lane, Lewisham (Messrs. Norfolk and Prior for Mr. C. C. Story).—Consent.

Mile-end.—A two-story addition to No. 99, Cophas-street, Globe-road, Mile-end (Mr. W. E. H. Crawley for Mrs. Weller).—Consent.

Peckham.—A one-story addition in front of Nos. 24 and 26, High-street, Peckham (Mr. G. F. Morgan).—Consent.

St. Pancras, West.—The rebuilding of the St. Pancras female charity school, Hampstead-road, St. Pancras, with projecting porch and bay window (Mr. S. G. Goss for the trustees of the school).—Consent.

Strand.—Two iron and glass shelters at the Gaiety Theatre, to abut respectively upon the Strand and Aldwych (Messrs E. J. Prest and Co. for Messrs. E. Runtz and Ford).—Consent.

Wandsworth.—One-story shops upon part of the forecourts of Nos. 1 to 10, Kingsley-terrace, Garratt-lane, Wandsworth (Mr. G. P. Pratt for Messrs. A. Aldridge and Co.).—Consent.

Hammersmith.—A one-story shop at the rear of No. 24, Shepherd's-bush-green, Hammersmith, to abut upon Camden-gardens (Mr. A. Dawkins for Messrs. Kellett and Firth).—Refused.

Kensington, South.†—Buildings on a site abutting on the north-western side of Kensington-road and eastern side of Melbury-road, Kensington (Messrs. Drivers, Jonas, and Co.).—Refused.

Lewisham.—Buildings on a site abutting upon the east side of Mayow-road and north

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side of Sydenham-road, Lewisham (Messrs. I. Edmondson and Son for Mr. J. Edmondson).—Refused.

Lewisham.—An addition at the flank of No. 37, London-road, Forest-hill, to abut upon Queen's-road (Mr. H. G. Brace for Mr. A. J. Dorrell).—Refused.

Norwood.†—A show-case in front of Nos. 247 and 249, Coldharbour-lane, Norwood (Messrs. Bursill and Ladyman, Ltd.).—Refused.

St. George, Hanover-square.—A projecting porch to Nos. 1 and 2, George-street, St. George, Hanover-square, to abut upon Conduit-street (Messrs. Patman and Fotheringham, Ltd. for Messrs. J. Broadwood and Son).—Refused.

St. Pancras, South.—A one-story shop upon the forecourt of No. 334, Gray's-inn-road, St. Pancras (Messrs. J. T. Bressey and Son for Rev. A. S. Baker).—Refused.

Lines of Frontage, Projections, and Width of Way.

St. Pancras, East.—The erection upon a site between Nos. 156 and 166, Euston-road, St. Pancras, of buildings with a projecting porch and bay windows, and with new pillars and railings to the forecourt, and to the enlargement of the existing cellars under such forecourt, and the erection of steps and railings at the rear of the buildings at less than the prescribed distance from the centre of the roadway of Grafton-place (Messrs. Essex, Nicol, and Goodman for the Hearts of Oak Benefit Society).—Consent.

Bethnal-green, South-west.—Buildings on the north side of Merceron-street (late Thomas-passage), Bethnal-green (Mr. J. Holmes).—Consent.

Kensington, South.—The rebuilding of Nos. 1 to 13, Leonard-place, Kensington-road, to abut also upon Edwardes-square (Messrs. Leslie Marsh and Co.).—Refused.

Lines of Frontage and Construction.

Hampstead.—An iron and glass carriage-washing shed in front of No. 49, Maresfield-gardens, Hampstead (Messrs. C. Saunders and Son, Ltd. for Mr. J. E. Withers).—Consent.

St. George-in-the-East.—Two iron bridges to connect a building on the south side of High-street, Wapping, with a proposed building on the north side of that street eastward of Church-court (Mr. C. Dunch for the London and Northern Estates Company, Ltd.).—Consent.

Width of Way.

Whitechapel.—Outbuildings at the Jews' Free School, Whitechapel, with external walls at less than the prescribed distance from the respective centres of Bell-lane and Frying-pan-alley (Mr. E. R. Robson for the managers of the school).—Consent.

Bermondsey.—That the Council do not accede to the request of Messrs. Humphreys-Davies and Co., on behalf of the South-Eastern Railway Company, for permission to erect a boundary fence next a block of working-class dwellings on the south side of Abbey-street, Bermondsey.—Agreed.

Woolwich.—A one-story building at the rear of No. 140, High-street, Woolwich, with external walls at less than the prescribed distance from the centre of the roadway of Elizabeth-place (Mr. J. O. Cook for Mr. H. A. Sheerman).—Refused.

Chelsea.—The covering in of a portion of a stable yard abutting upon the western side of Paradise-walk and northern side of Dilke-street, Chelsea (Messrs. Robertson and Co.).—Refused.

Southwark, West.—A building on the site of a way leading out of the south side of Clink-street, Southwark, with external walls at less than the prescribed distance from the centre of the roadway of Clink-street (Mr. H. Baerselman).—Refused.

Marylebone, West.—The rebuilding of Nos. 4 and 5, Cumberland-mews, Edgware-road, St. Marylebone (Messrs. Hudson and Hunt for the Church Army).—Refused.

Width of Way and Construction.

Bow and Bromley.—The construction of a steel shed on the north side of Rosebank-road, Bow, and with the forecourt fence at less than the prescribed distance from the centre of the roadway of the street (Mr. A. P. Stokes for Messrs. J. Manger and Son, Ltd.).—Consent.

Westminster.—An addition at the flank of No. 1, Montpelier-square, Knightsbridge (Mr. A. Williams for Mr. C. D. Harrod).—Refused.

Kensington, South.† — A wood and iron addition at the rear of Holland Lodge, No. 35, Addison-road, Kensington, to abut upon Holland-park-road (Mr. J. Boarder for Mrs. Moore).—Refused.

Width of Way and Projections.

Westminster.—A building upon a site abutting upon the west side of Barton-street and south side of Great College-street, Westminster (Mr. A. B. Jackson for the Governing Body of Westminster School).—Consent.

Width of Way and Space at Rear.

Fulham.—An addition to buildings on the south side of Effie-road and east side of Effie-place, Fulham (Mr. G. Pestall for the Metropolitan District Railway Company).—Consent.

Formation of Streets.

Lewisham.† — That an order be issued to Messrs Tompkins and Connew sanctioning the formation or laying out of a new street for carriage traffic, to lead from Kirkdale to Peak-hill, Sydenham, and in connexion therewith the widening of a portion of Peak-hill.—Consent.

Buildings for the Supply of Electricity.

Bermondsey.—Additions to the generating station and works on the west side of The Neckinger, Spa-road, Bermondsey (Mr. R. J. Angel for the Council of the Metropolitan Borough of Bermondsey).—Consent.

Cubical Extent.

Hoxton.—The extension of a building at Wharf-road, City-road, Hoxton, so that such building would exceed in extent 250,000, but not 450,000, cubic feet (Mr. P. E. Pilditch for the Gutta-Percha Company).—Refused.

Cubical Extent and Construction.

Greenwich.—The erection on a site abutting on the River Thames and approached from Blackwall-lane, Greenwich, of a building to exceed in extent 250,000, but not 450,000, cubic feet, to be used only for the purposes of the trade of a structural engineer (Messrs. Mark Fawcett and Co.).—Consent.

Deviation from Certified Plans.

St. Pancras, South.—Deviations from the plans certified by the District Surveyor, under section 43 of the Act, so far as relates to the proposed erection of a building on a site on the southern side of Tottenham-street and eastern side of Charlotte-street, St. Pancras (Mr. F. T. Verity for Mr. E. D. Maddick).—Consent.

Deviation from Certified Plans and Projections.

St. George, Hanover-square.—Certain deviations from the plan certified by the District Surveyor, under section 43 of the Act, so far as relates to the proposed rebuilding of a portion of No. 159, Piccadilly, and consent to the erection of a wooden oriel window to such building (Messrs. Joseph, Son, and Smithem for Lord Burnham).—Consent.

Space at Rear.

Kensington, North.—A bakehouse at the rear of No. 383, Portobello-road, Notting-hill (Mr. P. E. Gallagher for Mr. P. J. Münch).—Consent.

Kensington, South.—A four-story addition on the south side of No. 51A, Warwick-road, Kensington (Mr. W. G. Hunt).—Consent.

Lambeth, North.—An alteration to Nos. 117 and 119, Oakley-street, Lambeth (Messrs. Stock, Page, and Stock for Mr. S. Taylor).—Consent.

Kensington, South.—That the Council do make no order on the application of Mr. C. W. Stephens on behalf of Harrod's Stores, Ltd. for consent to the retention of blocks (Nos. 3, 4, and 5) of residential flats on the south-east side of Brompton-road, Kensington, with open spaces about such blocks.—Agreed.

Kensington.—A modification of the provisions of section 41, with regard to open spaces about buildings, as far as relates to blocks (Nos. 6 and 7) of residential flats on the south-east side of Brompton-road, Kensington (Mr. C. W. Stephens for Harrod's Stores, Ltd.).—Refused.

Fulham.—Buildings at the rear of No. 10, Parson's-green, Fulham (Mr. T. Heath).—Refused.

Space at Rear and Height of Buildings.

Holborn.—A building upon a site abutting upon Drury-lane and Kean-street, Holborn (Mr. H. P. Drew for Messrs. Boobbyer).—Consent.

Means of Escape at Top of High Buildings.

Kensington.—Deviations from the plans approved in respect of the means of escape in case of fire proposed to be provided, in pursuance of section 63 of the Act, at blocks, Nos. 1, 2, 3, and 6, Oakwood-court, Addison-road, Kensington, so far as relates to alterations in the means of escape at blocks Nos. 2 and 3 (Messrs Rolfe and Matthews).—Consent.

Kensington, South.—Means of escape in case of fire proposed to be provided, in pursuance of section 63 of the Act, on the sixth and seventh stories of Nos. 63 and 83, Oakwood-court, Addison-road, Kensington, so far as relates to the position and size of a doorway from the back room nearest the main staircase to the hall on the sixth and seventh stories (Messrs Rolfe and Matthews).—Consent.

The recommendations marked † are contrary to the expressed views of the local authority.

THE LONDON MASTER BUILDERS' ASSOCIATION:

ANNUAL DINNER.

THE Annual Dinner of the London Master Builders' Association was held on Tuesday evening in the Alexandra Hall, Trocadero Restaurant, Piccadilly-circus, W., Mr. Ernest J. Brown, President, in the chair. The company included Mr. W. F. King, President of the Institute of Builders; Mr. C. W. Green, President of the National Federation of Building Trades Employers of Great Britain and Ireland; Mr. W. F. Wallis, President of the Southern Counties Federation; Mr. W. P. Lewis, President of the South-Western Centre, National Federation; Mr. J. W. White, J.P., President of the Northern Centre, National Federation; Mr. J. Sharman Wood, J.P., President of the Midland Centre, National Federation; Mr. T. Parkington, President of the Eastern Counties Federation; and Messrs. W. E. Riley, Architect to the L.C.C.; Percy Preston, Master of the Worshipful Company of Carpenters; G. J. Brown, Master of the Worshipful Company of Tylers and Bricklayers; C. Ansell, J. M. Beveridge, L. Blake, C. E. Blomfield, A. E. Brown, J. Carmichael, J. Howard Colls, F. H. Crittall, D. Gardener, J. S. Gibson, G. Bird Godson, T. Gregory, F. Higgs, T. W. Havlock, H. A. Heffer, G. W. Humphreys, A. C. W. Johnson, J. R. Julian, W. J. Locke, D. W. McInnes, F. May, W. Nicholson, G. Parker, A. E. Parker, E. Price, J. Randall, L. C. Randall, C. P. Roberts, R. M. Roe, A. Ritchie, J.P., G. C. Sherrin, T. Seward, W. Shepherd, H. Smith, H. J. Treadwell, S. G. Thecker, C. W. Wall, J. B. Wells, Howell J. Williams, L.C.C., R. S. Henshaw, W. Lawrance, J. Brown, J.P., H. Crickmay, D. J. Driver, J. A. S. Hassal, and T. Costigan, Secretary.

The loyal toasts having been honoured, Mr. A. Ritchie, J.P., C.C., suitably proposed "The Imperial Forces," coupled with the name of Mr. J. Howard Colls, who responded.

Mr. W. F. Wallis then gave the "London Master Builders' Association and its President." The Association was not a thing of yesterday, he said; it had attained to a respectable age, and it was now at the very apogee of its power and influence. For several years very little was heard of the Association, but now it took high rank, if not the highest, amongst builders' associations. Perhaps this result was due to these convivial gatherings, which in the history of guilds, etc., were responsible for the creation of bonds of union between men. The Master Builders' Association had been singularly fortunate in two respects—*i.e.*, in obtaining such a secretary as they possessed, and also in the Presidents they secured. Mr. Costigan, the secretary, met all emergencies in a manner which indicated a man of no ordinary character, and he accepted his responsibilities with a willingness and earnestness which was beyond praise. However much he might be occupied with business, their secretary always had a genial smile, and was ready with valuable words of advice. The Presidents of the Association had been men of character, and there were other able men still eligible. He was quite sure that the present President would prove himself the equal of those who had preceded him.

The President, in reply, said that during the past twelve months they had had a very quiet time in the building trade, but the Association had made steady and excellent progress. The membership had increased, and the increased subscription had been paid readily—other Associations and Federations might very well emulate them in this respect. There were no arrears of subscriptions, which was no doubt due, in a large measure, to their secretary, to whose tact and hard work he could testify. It was a matter of surprise that there should be any firm of respectability in the trade who could keep outside the Association, and he was glad to say that there were very few such firms; one would think that with such an organisation in existence they would join the Association, and so strengthen it, numerically and financially, especially as it was to their interest to do so, and that if they did not they would have no one to help them in a time of trouble. The workmen

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were united, and they co-operated in a marvellous way, and it was a pity that the masters did not take advantage of what had been done by the Association, and what was being done, for the benefit of the building trade. As an illustration of the necessity for this co-operation on the part of the master builders of London, he might mention the following: They had formed a scheme with the object of improving the working hours during the winter. They spent a long time on the scheme, which they thought would be acceptable to the men. He met the representatives of the men privately, and they were evidently contented with the proposals, but when they met the Council as a body they said they could not accept the scheme, giving as their reason that all master builders did not belong to the Association. That showed the necessity for all builders being members of the Association. Great interest in the work of the Association was taken by the Council, as was evidenced by the full meetings they had. He regretted to say that their friend and past-President, Mr. Lough, had not, owing to an affliction, been with them since the last annual dinner, when he presided, and he was sure they would all join in an expression of sympathy to Mr. Lough. He regretted to announce that the Association had lost, through death, Mr. John Greenwood, the treasurer; Mr. Robert Turtle, an energetic member of the Council; and Mr. Benjamin Nightingale. They could not but deplore the loss of these gentlemen, but they welcomed the advent of new members. He was glad to say, also, that their friend, Mr. Ritchie, had joined them that evening.

Mr. W. F. King, President of the Institute of Builders, then proposed "The National Federation of Building Trades Employers of Great Britain and Ireland." The Federation was the link or the bond that united the Associations which were scattered throughout the country, and converted the weakness of isolation into the strength of unison. This was the work which the Federation was formed to carry out some twenty-five years ago, and they could all appreciate the uphill work which had been entailed in bringing the Federation to its present state of efficiency. It was no small task to guide the destiny of one Association, but it was a much greater work to unite the conflicting interests to be found in the north and in the south, the east and the west, and to induce them to work together for the good of the trade. The Federation was in a much more prosperous and satisfactory condition than it had ever been before, and this success was largely due to the able men who had filled the office of President. He had much pleasure in coupling with the toast the name of Mr. C. W. Green, President of the National Association.

Mr. Green, in response, said that the success of the London Association was largely due to their energetic secretary, but in London they were more concentrated, and it was much easier to keep in touch with the members. The National Federation included many Associations and many Federations, and he hoped that they would be able in time to show as good a record as the London Association had this year. They looked upon the London Association as a model Association, because it had what he called technical standing committees—committees of the various trades connected with the trade, and it was his object and aim, since he had been in connexion with the Federation, to follow the lead of the London Association in this respect. Supposing a disturbance occurred between employer and employed in any particular trade, it was possible to refer the dispute to the trade committee of the Federation, and await the advice of that body of experts. He believed the success of the London Association had been largely due to this system.

Mr. J. Brown, J.P., then proposed "The Architects and Surveyors." After a long experience he was able to say that the interests of these professions and the interests of the builders were identical, and he knew that when difficulties and trouble arose the best friends the builders had were the architects under whom they were working. Mr. Brown, having referred to the antiquity of the architectural profession, said the architect was the man who creates, the man who showed what was to be done. He had often wished that it could be possible to take a few dreamers, put them apart from others, and let them dream dreams, without the necessity of thinking about their daily bread, and then—after some years, to put those visions of beauty into being. This was not possible, and the dreams of men of genius were lost to the world because of the daily work of the world. An architect could not only make designs of beauty, but he knew, and had to know, a great deal about construction, etc., and, however glorious might be his dream, he would have failed if he did not succeed, for instance, in keeping out of his building such elements as wind and wet. The knowledge of the architect had to be profound on the scientific side, and complete on the side of beauty. It was a glorious thing to belong to the architectural profession. The quantity surveyor had come into existence in comparatively recent times, and the amount of care they took and the correctness they displayed in their work was really wonderful. With the toast he coupled the names of Mr. J. S. Gibson and Mr. Walter Lawrance.

Mr. Gibson responded for the architects. He said that architects had to rely on builders to make their work really tangible, and to put their designs into execution. All really good architecture was founded on sound building, and in the complexities of modern life and practice architects looked to builders to give them sound building, so as to portray in the best manner possible the designs of architects. There was no doubt that the architectural profession was a very old one. It was rather curious that from about the XIth century to the XVth century the architects who were responsible for the magnificent cathedrals in England and France were master builders; but now architects had ceased to be builders in one respect, and he was glad to say that they had been able to put upon the shoulders of others some of the worries incidental to modern building, for there was thus left to architects some time to dream those dreams they had heard about; but, no matter how beautiful those dreams might be, an architect wished to see his designs carried out, for no drawing, however clever and good, could adequately portray the meaning or beauty of his work; only the building could do that. Attendant on the worries of building, architects hoped builders would be merciful in the matter of extras; architects would take care to look after omissions. He wanted to tell them of a very beneficent practice amongst the Greeks at the time when they erected some of their fine temples. The Greeks evidently knew what to expect from architects or builders, and, when they gave a commission to erect a temple, as a preliminary they required that the architect should deposit with the authorities bonds or security to a considerable amount. If in the erection of the building the extra or additional work did not exceed 25 per cent. the architect was paid, and nothing was said about the extras, but if they exceeded 25 per cent. the architect had to defray the additional cost out of the security he had deposited. He thought the modern English practice a much better one.

Mr. Lawrance, in responding for the surveyors, referred to the recently-formed Quantity Surveyors' Association. There had for a long time been a need of some body or association to check the preparation and issue of bills of quantities by unqualified practitioners. Unfortunately, the Surveyors' Institution, embracing all branches of the surveyors' profession, had not been able to devote to the subject the attention which it deserved. The Quantity Surveyors' Association would endeavour to supply the need by the admittance to its ranks of men who by practical experience and training were fully qualified, and by the admission of younger men after examination in the practice and work of quantity surveyors. Unfortunately the Association had received a good deal of unfair criticism, and the qualifications the Association intended to enforce had been criticised. One of those qualifications was to the effect that every member should be responsible and should pay for all loss caused by his errors on an appeal being made to the Council of the Quantity Surveyors' Association by either the builder or the building owner, and that if he refused to pay he should be expelled as a member of the Association. Was that not a step in the right direction? Of course that did not alter the present law on the subject one jot. Builders were responsible for many of the evils relating to quantities. They often based their tender on so-called bills of quantities which they knew were fit only for the waste-paper basket, and they tendered for work without quantities. Why they should saddle themselves with an expense which ought to be borne by the building owner he did not know. In several provincial centres builders had refused to tender for work of any importance or size unless proper quantities were supplied. As the first President of the Quantity Surveyors' Association, he looked to builders for support, for their sole aim was the improvement of the work of the quantity surveyor.

Mr. W. Shepherd proposed the concluding toast—*i.e.*, "The Guests," coupled with the name of Mr. Percy Preston, Master of the Carpenters' Company. Mr. Shepherd referred to the value and importance of the work done by the Company in the establishment of technical schools in connexion with the building trade.

Mr. Preston, in responding, said there were some classes in connexion with the Trades Training School at Great Titchfield-street which they would like to see more adequately supported by builders. He specially referred to the plasterers' class, and if builders would send more men to the class not only would the plasterers themselves receive benefit but their employers would also. There was another point he would like to refer to. The Company had lately taken up the question of forestry, for they thought that afforestation was a most important matter. Land owners and those who had land at their disposal should do all they could to further the growth of timber in this country. The Company had offered prizes for essays on the subject, and they had received forty or fifty papers, and from these they hoped that some good would come. On the 25th of February a lecture was to be delivered on forestry in the Hall of the Carpenters' Company by Professor Schlich, of Cooper's Hill College, and it was to be hoped that there would be a good audience of builders and others interested. The lecture would deal with the necessity of looking to the growth and planting of trees to replace those cut down. He might mention that a list of workmen was to be prepared by the superintendent of the school at Great Titchfield-street, and he trusted that master builders who needed men would apply to the superintendent. Only efficient men would be put on the list.

The proceedings then terminated.

THE BUILDERS' FOREMEN'S ASSOCIATION.

THE tenth annual dinner of the Builders' Foremen's Association was held on Saturday last in the Throne Room of the Holborn Restaurant. The chair was occupied by Mr. Charles K. Burtt (Messrs. C. Burtt and Son, Camberwell), who was supported by Mr. B. T. Price (President of the Association), the Mayor of Camberwell (Mr. H. R. Taylor, L.C.C.), and Messrs. J. Wright Clarke, Eric Earle, J. Girdler, Le Marchant, R. N. Taylor, G. Thomson, F. A. Ruddle, and a large company of members and friends.

The loyal toasts having been honoured,

The Chairman proposed "The Builders' Foremen's Association." The Association, he said, was started in 1894, and had steadily increased its membership and funds ever since, until it had reached a satisfactory financial position, with a balance in hand of 290*l.*, which was an increase in the year of 85*l.* But what was still more gratifying was that the aims and work of the Association were being more generally recognised in the building trade, as was shown by the increased amount received in honorary subscriptions and donations. The satisfactory financial condition of the Association had enabled the executive to disburse last year more than 20*l.* in grants to those members needing assistance. There had been no deaths amongst the members during the past year, and the insurance fund showed a satisfactory balance of 159*l.* During the past year a work had been started which had been under discussion for some time, *i.e.*, the old age pension fund. It had been started on very modest lines, but it was hoped to enlarge its scope as the funds of the Association increased. A great deal of hard work had been necessary to put the Association in its present satisfactory condition, and he thought they could congratulate themselves on having such excellent officers. He felt it was a great pleasure to be associated with such a society, which had for its aims the help of its members in time of trouble

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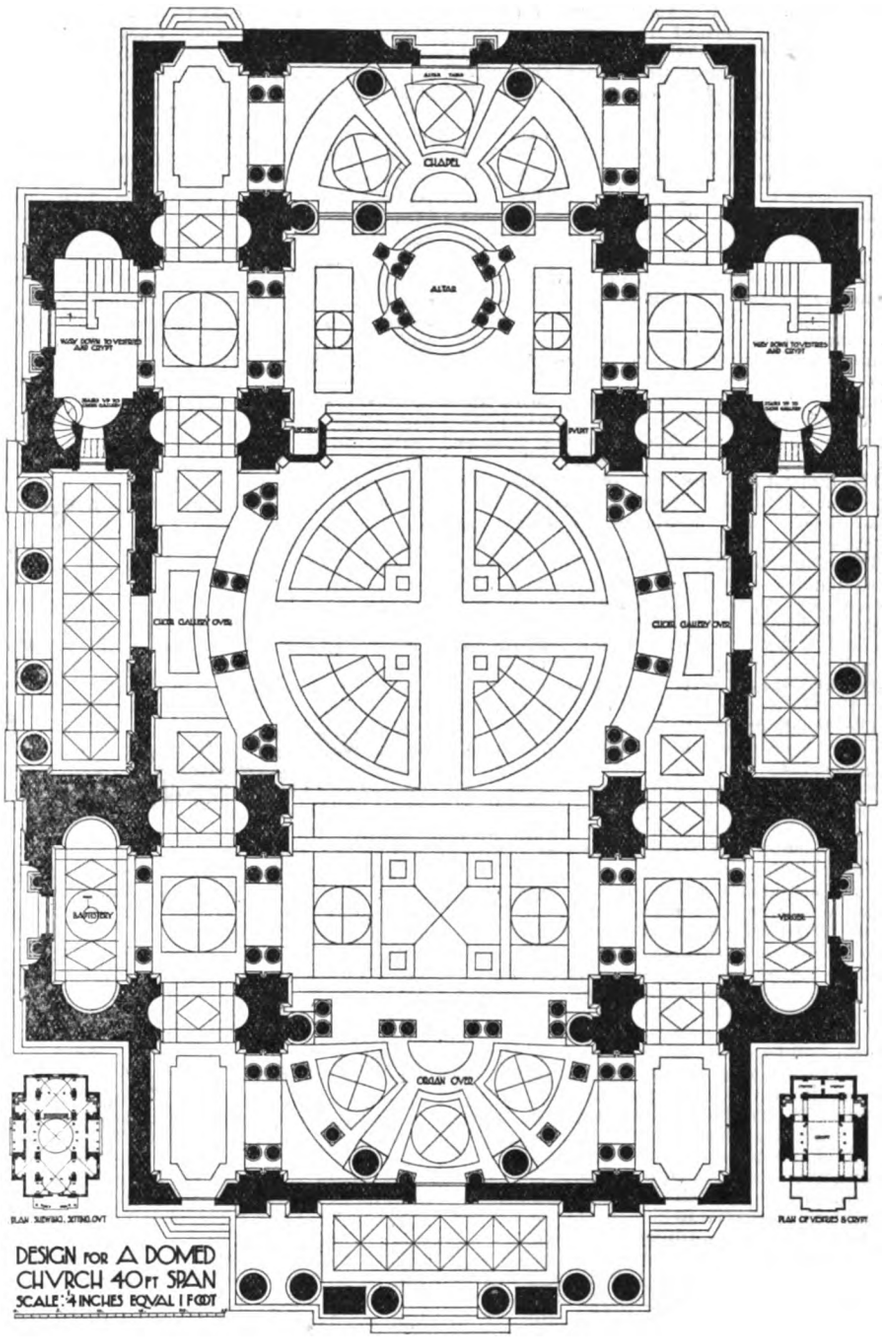
and their intellectual advancement as well, and he would be glad to become associated with them as an honorary member. We were apt to forget that we could make this workaday world better and happier than it is by being honest and industrious citizens and by helping others when they were in distress. It now required much active vigilance to achieve success in the world, for capacity was tested now by a far higher standard than ever it was before. We had to make a great sacrifice if we wished to retain our places in this competitive age, and we could not hope to bear the stress of work for as many years as our forefathers did, and this old age pension scheme would help the less fortunate of their members to end their days free from financial care, while to the successful members it would afford an opportunity of doing that good which meant so much morally and physically. He congratulated them on their success and on starting the old age pension scheme.

Mr. B. T. Price, President, who responded, said he should like to mention that their Chairman had sent the Secretary a cheque for 20*l.* for the good of the Association, and he hoped that all those who could would do something in the same direction. He hoped that the work of the Association would become more generally known and that many more foremen who were eligible would join their ranks. There was nothing in their aims or rules to cause discord or strife; on the contrary, their objects were to bring about good feeling amongst builders' foremen, to bring them into social intercourse one with the other, to promote their welfare in every possible way, and to make them more fit to fill the position they occupied.

Mr. G. Thomson then proposed "The Building Trades." He said he was sorry he could not congratulate them on a year of prosperity in the trade, for from what he had seen the past year was one of depression in the building trade. But trade fluctuated; there were periods of good and bad trade and he hoped that last year was the last of the cycle of bad years and that this and succeeding years would show much improvement. No trade more directly showed prosperity or depression than did the building trade. One noticeable tendency in the industry was for firms to amalgamate and become syndicates, and he was wondering how that would affect them all. He did not think they would have the same feeling towards their principals when these great combines were effected, but he felt sure that their employers would never get on without foremen as long as foremen did their work well. Another matter was the American invasion with which they had been threatened; as to which, he hoped that the civic authorities would stop any tendency to erect those hideous "sky-scrapers" which were to be seen in the States. He hoped that foremen would take up all that was good in the American work and reject anything that was bad. The endeavour of the Association was to keep the members well informed in all matters relating to their business; to raise them intellectually and give them as far as they could greater capacity to carry on their duties. They helped one another as much as possible by associating together, for that had become more and more a necessity in these days. He hoped that all those foremen who were eligible would join them without delay. It was an excellent thing to help one's self and at the same time help others. One of the features of the past year was the excellent course of lectures delivered to the Association, all on subjects of direct interest and instruction to members, by authorities on the various subjects. During the year, too, visits to buildings and works had been made, and in addition to the other works of the Association they had heard about he might mention the establishment of the "Quarterly Report," which formed a journal of the Association's transactions. With the toast he coupled the name of Mr. H. R. Taylor, Mayor of Camberwell.

Mr. Taylor suitably responded, and mentioned that he was a bricklayer by trade, his father was a bricklayer, and his grandfather also. As to the introduction into this country of American methods of building, he had the pleasure of going through the States last year on a commission to inquire into the American methods of industry, and he could say that those methods, so far as building construction was concerned, would never get any hold in this country. There were two reasons for this, but one reason above all others, *i.e.*, that in those methods of construction no value whatever was placed on human life. Americans did not seem to think it mattered how the work was done so long as it was done. He saw some fine buildings in the States, but, in spite of all that Americans had good reason to be proud of, he preferred the buildings of this country. For beauty and for durability of construction—which was more important, from his point of view, as no doubt it was from theirs—the English work could not be surpassed. Employers in this country had some interest in protecting human life. The American system of construction was altogether different from what it is here. In some work he saw being carried out there was no mortar in the bed or cross joints, and in reply to his question whether there was much work of that kind done, the answer was, "Not so much now as there used to be." The American method seemed to be to lay bricks without mortar, and he hoped that that sort of thing would never be done here. Some of the best men of this country had been connected with the building trade and he hoped it would always be so.

The concluding toasts were:—"The Visitors," proposed by Mr. R. N. Taylor and suitably acknowledged by Mr. J. Wright Clarke; and "The Chairman," proposed by Mr. E. Carter.



Design for a Domed Church, by Mr. E. Vincent Harris, A.R.I.B.A. Plan.

NEW ACADEMICIANS.—At a general assembly of Academicians and Associates of the Royal Academy of Arts, held on Wednesday evening, M. Léon Bonnat, painter, and M. Emmanuel Frémiet, sculptor, were elected honorary foreign Academicians, and Mr. Frank Brangwyn, painter, Mr. Charles W. Furse, painter, and Mr. H. Pegram, sculptor, were elected Associates.

Illustrations.

THE TOWN HALL, FRANKFORT.

FOR some years the increasing commercial prosperity of Frankfort had rendered the space provided for the Town Council in the Town Hall quite inadequate. This ancient Town Hall, or "Römer," as it is always called, was built in the XVth century, and contains an Electors' Room, or Wahlzimmer, where the Electors used to assemble, and also a Kaisersaal, in which are portraits of all the Emperors from Charlemagne (768) to Francis II. (1792).

It was suggested that this building might be converted into a museum, but the lighting of the rooms proved to be insufficient; moreover, the historical interest of the place was one reason for retaining at least the chief part of it for its original purpose.

It was decided, therefore, to build the new Town Hall, which was to contain all the necessary halls and offices, in connexion with, and as an extension of, the older building. This plan presented many difficulties owing to the limited space available, and also to "rights of way" which had to be preserved. Four architects undertook to make out plans on these lines; they were F. von Hoven, F. Luthmer, L. Neher, and H. Schmidt. The combined plans of the architects F. von Hoven and L. Neher were

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finally accepted, and in the summer of 1900 a committee was formed to carry the work through. Herr Hellmuth Cuno was elected chairman, and the superintendance of the building operations was placed in the hands of Herr Stephan Blattner.

It was found necessary to pull down three of the most ancient houses in the town. Of two of these there are records dating from 1336, and of the other the first notice is in 1359. The most interesting parts of these houses have been incorporated in the new buildings; thus, an archway built in 1603 has been employed in the Council Room, and in one of the smaller towers a fine Gothic mural ornament has been used, representing the Frankfort eagle and bearing the inscription:—"Benedictum sit nomen domine nostri Jesu Christi Anno salutis MDXI." Also in the north section there is another eagle from one of these ancient houses, with the inscription:—"Hic locus odit amat punit conservat honorat nequitiam pacem crimina jura probos extruct. A.C. MDCCXVII."

The difficulty of the right of way has been overcome by turning a narrow passage into an inner court, with entrances at diagonally opposite corners.

The architects have endeavoured to group the new buildings so that from all points they should present a picturesque appearance, in keeping with the old part of the town in which they are situated. The best view of them can be obtained by standing in Paul's Platz facing Bethmannstrasse; it is from this standpoint that the illustration in our plate has been taken.

The buildings are constructed chiefly of a good red sandstone taken from quarries in the neighbourhood, but from the second story upwards basalt has been also employed to lighten the effect. They are best described as being in three sections—the section containing the Banqueting Hall, the South section, and the North section.

The Banqueting Hall forms a continuation of the west wing of the Römer Hall, or "Golden Swan." Here there is a fine entrance hall, through which is reached the staircase which leads to the second floor, where are the Council Chamber and the adjoining Banqueting Hall. A gallery which runs across this hall and overlooks Paul's Platz, forms the connexion between the Council Chamber and the Römer. It may be mentioned that the Electors' Room in the ancient Römer has been successfully restored by Herr F. Luthmer. A balcony, on a level with the Banqueting Hall, runs the whole length of this section; and over it, in the place of gargoyles, small sculptured figures have been placed. Here a small boy is catching the water from the gutter in his cap, there a monkey is slaking his thirst with wide-open mouth, and in another corner a little ragamuffin is flying in terror from a toad. This balcony is continued over the north gateway, where it takes the form of an open verandah, which will probably be used as a place of honour on the occasion of any procession or festival. Over the columns which support it are portrayed scenes from the life of "Reinecke Fuchs"; on the left two cocks are fighting, whilst in the centre the fox is stealing one of the hens, and on the right the captured thief has been brought to justice. The arms of Frankfort and its suburbs are displayed over the window of the first and second floors, against backgrounds of flowers and fruit.

On a level with the gallery there are various figures standing in niches under carved canopies—Science is represented with a lighted torch in her left hand and the spirits of Bigotry and Tyranny crushed under her feet. Art is next represented, and Abundance with an overflowing cornucopia; Commerce is shown holding a ship and the staff of Mercury in her hands, and Industry, wearing a mediæval head-dress and simple garment, bears a hammer, an anvil, and a cog-wheel.

The South section is grouped round three courts. The heating apparatus is laid under the middle court, and the two side ones, besides affording light and air to various offices and rooms, form part of the plan for preserving the right of way alluded to above. The chief entrances in this part of the building are in the north and south sides of the middle court, and from these spring the chief staircases, and other stairs are situated in the corner towers in Paul's Platz and the west court. Taking the whole group of new buildings together, there are in all eleven different staircases.

The principal tower is in the South section, at the corner of Bethmannstrasse. It rests on foundations which are laid on the rock 42 ft. below the street level and rises to a height of 227 ft. The upper portion is copied from the old tower on the bridge at Sachsenhaus which was destroyed in 1765. On the east and west sides there are two large mosaics; the one on the east side represents St. Florian, dressed as a knight in golden armour and a red mantle, against a background of deep blue sky, pouring water on a flaming house. On the west is portrayed St. Michael, the patron of Germany, in a flowing robe and mighty wings, standing against a golden background; in his left hand he is holding a shield, and in his right a spear, with which he is subduing the traditional dragon. The eagles above the mosaics are in relief, and are over 10 ft. high. On the north and south sides are two clock faces, which measure 13 ft. across.

The principal entrance in Bethmannstrasse is noticeable for the variety and richness of its decorations. The Frankfort arms appear in the centre, and the heads of the architects, F. von Hoven and L. Neher, crowned with laurels, on either side. On the columns which flank the doorway stand two figures in copper, representing Konrad Koler and Wilhelm Dilich, architects of the XIVth and XVIIth centuries. A suitable inscription for the scroll has not yet been decided upon.

The ground floor on the south side of Bethmannstrasse has been utilised for large shops, probably in order to insure a brilliant lighting for that part of the street, which would otherwise be in semi-darkness in the evening.

It was found necessary to connect the North and South sections by a bridge, with a span of 59 ft., which springs from the second stories where Bethmannstrasse runs into Paul's Platz. Besides being of great practical use, this bridge greatly improves Paul's Platz, giving it the appearance of an enclosed court. The upper part of the bridge forms a covered arcade or passage, the ceiling of which is very artistically decorated, but the figures and medallions which are to appear in relief or semi-relief on the exterior are not yet completed.

The North section, which is to serve as the Town Treasury, is built more in the style of a bank. It is grouped round an inner court, which is roofed in with glass. The principal entrance faces Paul's Platz; the doorway is framed by two three-quarter columns, and above it are three figures; the middle one represents Justice, on her left is a figure bearing in her left hand a mirror, and grasping a rudder in her right, behind which sits an owl. This is "Foresight" who, gazing in the mirror of the Past, draws knowledge for the guidance of the Future. On the right of Justice reclines "Thrift," holding a long account in one hand and a purse in the other.

The style of architecture employed in this section is that which was most commonly in use in Frankfort at the end of the XVIIth and the beginning of the XVIIIth centuries. On the rounded corner in Paul's Platz there is a projecting bay, supported by a Medusa's head, which is finished above the cornice by a lantern in copperwork. The façade on the north side of Bethmannstrasse is similar to that on Paul's Platz.

The new buildings have been supplied with all modern conveniences, such as a central heating system, electric lighting, lifts, electric bells, and telephones. The interior, however, is still incomplete, and awaits extensive decorations at the hands of sculptors and artists.

The illustration is from a photograph taken on the day of the official opening. We are indebted to the architects for this and for sending us a printed description, from which the foregoing particulars have been compiled. We much regret that they did not also favour us with a plan, which would have been of considerable interest.

A DOMED CHURCH.

THIS design has been awarded the Royal Academy Gold Medal, a Prize of Books, and Travelling Studentship of 200*l.* for the Study of Architecture abroad. The subject as set was:—

A Domed Church, 40 ft. span, and not less than 120 ft. long inside. The drawings to be six in number, and consist of two elevations, two sections, and plan; all to be drawn to a scale of 4 ft. to 1 in., and each drawing to fill a double elephant sheet of paper; also a perspective view in which the building shall not be less than 24 in. in width.

This subject, although no doubt very inspiring, is by no means an easy one to treat, and though a rectangular plan may possibly be rather commonplace, it is evidently one of the most satisfactory methods upon which to construct "A Domed Church" of this description, both for convenience in working and for internal effect.

The building is intended to be constructed entirely of Portland stone and concrete, with oak and bronze fittings and furniture. The plan is divided internally into a cruciform distribution of area, the longitudinal compartment being split up into three divisions, with the central portion carried up and surmounted by a dome about 40 ft. in diameter (being my interpretation of the above requirements). The dome and western bay form the nave, while the eastern portion, terminated by an apse pierced for windows and also lighted from semi-dome over, forms the chancel and sanctuary.

The north and south arms are separated from the central domical area by columns of the Corinthian order 22 ft. 3 in. high from floor to underside of cornice, upon a plinth 18 in. high, thus providing complete bases to range round the ambulatory; these columns help to carry the wall or tympanum under the main arches supporting the sides of the dome; this wall is carried up as a clearstory pierced by a large central window, and becoming external between the cupolas placed at the four corners of main portion of building. The almost similar wall at the western end is carried upon coupled columns spaced wider apart than the single columns on north and south sides, to provide space for the main central entrance, and pierced over for a larger central window than those provided in the similar space on north and south elevations.

The east end is of a triapsidal termination, with separate entrances and lobbies for the clergy and choir, each lobby being provided with stairs up to the cupolas and down to the vestries in the basement; similar stairways are also provided at the west end; these lobbies are also connected above ground level by an ambulatory as shown on plan, thus giving easy and uninterrupted access to all parts of the building, also to the memorial and morning chapels immediately upon either side of chancel.

The organ partially fills the archways between chancel and these side chapels, being constructed upon carved oak corbels projecting out over the return way for communicants behind the choir stalls, with the organist's seat upon north side facing the choir, the top of the console and the back of the choir stalls being upon a level.

The open screen forming the ambulatory would be in oak, panelled up to 5 ft. 6 in. above the ambulatory floor and filled in immediately behind altar table, which would also be accentuated by pediment over same filled in with carving.

Three entrances are provided at the west end, with a main central entrance, approached by broad flights of steps, lighted at either end by lamps carried upon heavy bronze standards and stone bases.

The south-west angle of the building forms a baptistry, the marble font being raised above the main floor level, and the cover, which is suspended from the ceiling with counterpoise, etc., of richly-worked bronze.

It was my ambition to provide a plan adaptable to modern requirements and at the same time producing an internal effect of mystery with light and shade without the use of gaudy and unnecessary ornament, together with an elevation correctly interpreting the plan. All carving and ornament would be concentrated upon the chancels, the side chapels, and fittings throughout.

The four spandrels below the dome and between main arches were to be filled in with sombre mosaics, and the upper portions between the ribs of the dome and over the west end to be filled in with appropriate frescoes; these would be lighted from square-headed windows immediately below the dome, the glazing of which is set back so as to be hardly visible from the floor of the nave and from the west window.

L. U. GRACE.

DESIGN FOR A DOMED CHURCH.

THIS design, by Mr. E. Vincent Harris, was one of those submitted in competition for the Royal Academy Gold Medal; we referred to it at the time as being a design of considerable character, and certainly the best of the unsuccessful ones; we wish, therefore, to take the opportunity of publishing it.

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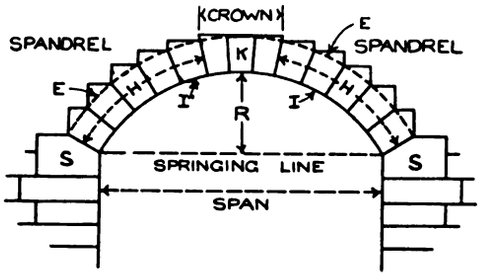

Fig. 33.

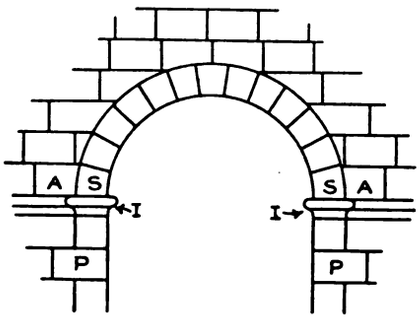

Fig. 34.

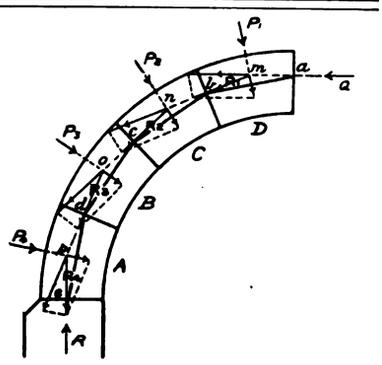

Fig. 35.

Correspondence.

"THE FIRST SHIP CANAL IN ENGLAND."

SIR,—Referring to your interesting reference to the Gloucester and Berkeley Canal, it may be right to add Exeter possesses the earliest ship canal in England. It was opened, with complete artificial locks, in A.D. 1566. William Stroode, of this city, first proposed the undertaking in 1560, and, three years later, the task was commenced by John Trew, who, on September 25, 1563, did "stunde bounden yn the some of fyve hundreth pound to the Maior, bayliffs, and co'ialtie of the Citie of Excester for the perfectinge of the new worke" (Art Book, No. III., f. 197-198).

It has since been twice extended and enlarged, *i.e.*, in 1698 and 1829.

Exeter, January 22. HARRY HEMS.

*** We are aware that there is a ship canal from Exeter to Topsham (five or six miles away), formerly the port for Exeter; but it is comparatively small and only available for small vessels. Larger vessels stop at Topsham, and still larger at Exmouth. Small vessels come up to the quay at Exeter. Of course, our "Note" merely referred to the earliest *modern* ship canal.—ED.

COMPETITIONS.

GRAMMAR SCHOOL, NEWCASTLE.—A new Grammar School is about to be erected at Newcastle. By advertisement it is intimated that the governors are prepared to receive designs in competition for the projected building. Premiums of 100*l*., 50*l*., and 25*l*. are offered to the authors of the first, second, and third premiated designs respectively; and Mr. John Bilson, F.R.I.B.A., F.S.A., has been appointed assessor in the competition. The site is behind Windsor Terrace, Jesmond.

TOWN HALL, SUNDERLAND.—The assessor who was appointed to adjudicate upon the competitive plans for the extension which it is proposed to make to the Sunderland Town Hall has now made his award, but the names of the designers of the winning plans will not be disclosed until the next Council meeting. The premiums offered were 100*l*., 50*l*., and 25*l*. for the first, second, and third plans. The assessor has informed the Town Hall Committee that the plan which he considers the best has the most excellently-arranged interior he has ever seen. The most striking feature of the plan is that the designer, in a sense, revolutionises the existing building in order to make the Town Hall, when completed, present the appearance of being one building, and not a building to which an addition has been made at a later period. To effect this he abolishes the present main entrance, and makes a new one further to the north, so that it will be in the centre of the entire building when the new portion has been added. Inside the entrance is a large hall, and from it a staircase leads up to the corridors above. These corridors lead to north and south, and reach every room, both in the old and the new portion; indeed, some of the existing rooms will be easier to get at from the new staircase than from the old one. The existing staircase will be pulled down, and the present Health Offices extended over the space. The Borough Engineer's office will also be enlarged. The new portion is to contain offices for the education, the electric light, cemeteries, and tramways departments, and the rooms for these have already been located. The grouping of the offices altogether on the ground floor will be found to be most advantageous. The Reception Room is at the north end, and has three conveniently-sized committee-rooms adjoining it. The cost of erecting the building, according to the winning plan, is 27,600*l*.; the majority of the other plans run at about 30,000*l*.—*Newcastle Chronicle.*

The Student's Column.

ARCHES.—V.

AS our attention will be devoted for the present more particularly to masonry arches, it is necessary to add a few definitions relative to the component parts of, and the forces acting within, such structures

Arches of stone or brick differ from metal and timber arches in the respect that the material spanning the space between the abutments is composed of separate pieces, or blocks, having little or no cohesion.

With the exception of flat arches the blocks of material are always assembled in the form of an arc, termed the *arch-ring*, or simply the *ring*.

In the stone arch each separate block used in the construction of the ring is described as an *arch-stone*, or *voussoir*, and is a prism of stone in the shape of a truncated wedge, in which the sides are at such an angle as will best facilitate the formation of the curve required to be assumed by the arch-ring. The outer ends of the voussoirs shown in Fig. 33 are shaped suitably for the horizontal joints of superincumbent masonry.

In a brick arch-ring each brick may act as a voussoir, but two or more bricks may be bonded in such a way that the group practically forms a single voussoir. As a general rule, however, a brick arch is built in several rings, and, as the joints are stepped and interlocked in accordance

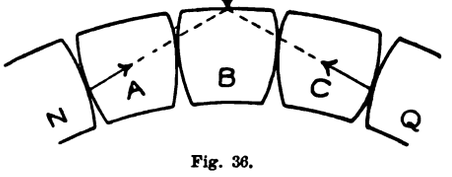

Fig. 36.

with the system of bonding adopted, it would not be correct to regard such an arch as built of voussoirs with plane joints passing in a straight line through the ring. For the present we will confine attention to stone arches.

The uppermost or central voussoir, where one stone occupies that position (as K, Fig. 33), is called the *keystone*. This term implies that the central stone, being the last to be put in place, has the effect of keying the whole structure together. It should be noted, however, that in an extradosed arch (Fig. 34) no one of the voussoirs is more important to the stability of the structure than any other voussoir.

The *crown* of an arch (see Fig. 33) is the summit or highest part of the ring. That part, on each side of an arch, between the crown and the abutment (H, Fig. 33) is known as the *haunch*.

Each end of an arch-ring springs from a stone in the abutment (S, Fig. 33), described as a *skewback*, this term being also applied to the inclined surface, or joint, supporting the end of the arch. Sometimes the masonry from which the end of an arch springs is called the *quoin*.

The lowest voussoir, or arch-stone, of the ring is termed a *springer*.

The plane of demarcation between the ring and the skewback is known as the *springing*, and the inner edge of the skewback is sometimes described as the *springing line*. It is more convenient, however, to employ the term springing line to denote a line joining the inner extremity of the springing joint, as indicated in Fig. 33.

An *abutment* is that part of an arched structure which resists the lateral thrust of the arch, and generally consists of the skewback and the masonry by which it is supported and held in position. In some cases, as in the arch represented in Fig. 34, where the springer (S) rests upon an *impost* (I) forming the upper part of a pier or column (P), and where the arch springs directly from the impost, the abutments (A A) are those portions of the wall, or other structure, above the springing.

The inner or concave surface of an arch is termed the *soffit*, while the concave line of intersection of the soffit with a vertical plane perpendicular to the axis of the arch is the *intrados* (I I, Fig. 33). The *extrados* is the convex curve, in the same plane as the intrados, bounding the outer extremities of the joints between the voussoirs, as indicated by a broken line in Fig. 33, or bounding the upper parts of the voussoirs themselves, as in Fig. 34.

The vertical distance between the plane of the springing line and the highest part of the intrados is the *rise* of the arch. In Fig. 33 the rise is indicated by the dimension R. The highest part of the intrados is alternatively called the *under side of the crown*.

By the *span* of an arch is meant the perpendicular distance between the springings, as shown in Fig. 33.

The space between the extrados and the roadway of an arched bridge is termed the *spandrel* (see Fig. 33), and the material disposed in this space is termed the *spandrel filling*. This filling may consist entirely of masonry, or of two outer spandrels, called *spandrel walls*, filled in with earth or any suitable material. Sometimes the spandrel filling consists of several walls built parallel with the roadway, and connected at the top with small arches which support the roadway.

Some writers use the term spandrel to signify simply the outer walls forming the faces of the bridge.

The masonry above the haunches of the arch-ring, and carried, between the spandrels, to the abutments, is then described as the *backing*, while the designation *filling* is applied to any material placed between the backing and the roadway. Backing masonry is usually laid with horizontal joints.

Voussoirs showing at the ends of an arch—that is, at either face—are termed *ring stones*, while voussoirs which do not show are described as *arch sheeting*.

A *string course* is a course of voussoirs extending from one end of the arch to the other, and the joint, continuous from end to end of the arch, between two adjoining string courses is termed a *coursing joint*.

A *heading joint* is a joint in a plane at right angles to the axis of the arch, and is not continuous. The stones between two consecutive series of heading joints constitute a *ring course*.

The *line of resistance* is the line connecting the points of application of the resultants of all the forces acting upon the several voussoirs of an arch.

To make this point clear, let us take as an example the semi arch shown in Fig. 35, assuming that the voussoirs are finished so as to fit perfectly, and that no adhesion is afforded by mortar in the joints. We will also assume that the structure is held in equilibrium by the horizontal force Q, which in this case represents the reaction of the right-hand portion of the

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arch, and is applied at the point *a* in the outer joint of the voussoir D.

The forces P_1, P_2, P_3, and P_4 represent the resultants of all the forces acting upon the voussoirs, including the weight of the material of which they are composed. The voussoir D is in equilibrium under the action of the three forces Q, P_1, and R_1 the reaction of the voussoir C. Consequently these three forces must intersect at a point, and the resultant pressure R_1, between the two voussoirs D and C, can be found by the graphical method in accordance with the principle of the parallelogram of forces, as shown in the figure. The resultant R_1 is applied at the point *b* in the joint between the voussoirs D and C, this being the point of intersection.

Similarly, the voussoir C is in equilibrium under the action of the three forces R_1, P_2, and R_2, the last being the reaction between the voussoirs C and B. The direction, magnitude, and point of application of R_2 can also be determined by the graphical method. In this case the point of application is at C in the joint between the voussoirs C and B.

The directions, magnitudes, and points of application of R_3 and R_4 are ascertained in like manner.

The points *a*, *b*, *c*, *d*, and *e* in Fig. 35 are designated the *centres of resistance* for the voussoir joints, and the line *abcde* is the *line of resistance* of the semi arch. But the points *a*, *b*, *c*, *d*, and *e* may be considered alternatively as the *centres of pressure*, being the points of application of the pressure upon the voussoir joints. In that case the line *abcde* would be termed the *line of pressure* of the semi arch.

To be strictly accurate, the line of resistance is a continuous curve in which the equilibrated polygon *abcde* is inscribed. The greater the number of joints the nearer does this polygon approach the true line of resistance, and with an infinite number of joints the polygon is transformed into a curve coinciding with the line of resistance.

Sometimes the polygon *mnop* is described as the line of resistance, and as the number of joints is increased so does the polygon approach the curved form. For an infinite number of joints the resulting curve *mnop* is identical with *abcde*, the curved line of resistance.

We may now direct attention to the fact that if four jointed rods were placed in the positions occupied by the lines *ab*, *bc*, *cd*, and *de* in Fig. 35, and were acted upon by the forces Q, P_1, P_2, P_3, P_4 and R as indicated, they would be in a state of equilibrium, although the equilibrium would be unstable.

Let us now assume that by some means stability has been imparted to the series of jointed rods, considered to be represented by the lines *ab*, *bc*, *cd*, and *dc* in Fig. 35. The arch so formed is now an inverted linked chain, and is in perfect equilibrium. Hence a curve passing through the joints *a*, *b*, *c*, *d*, and *e* is termed a *linear arch*. This simple demonstration may serve as a further elucidation of the definition of the linear arch given on p. 86 in our last article.

We will now see how stability is secured in actual practice. Suppose that instead of being built up of jointed rods, taking the place of the four lines in Fig. 35, the arch were composed of stone blocks or voussoirs having curved surfaces, allowing them to rock upon each other to a certain extent. Each voussoir will then only touch its neighbour at one point, such points being termed *points of contact*, and the line connecting these points is a linear arch. An arch so constructed clearly differs from an ordinary arch, in the respect that the centre of pressure at the joints is shown by the points of contact, while the rocking of the stones will cause such alteration in the position of the points as may be necessary to preserve equilibrium.

It is clear that a rocking action of the kind described gives the arch a stability which cannot be possessed by an inverted series of linked rods. The loads may be altered, or the form of the arch may be disturbed within certain limits, without causing failure of the structure, and each voussoir will remain in equilibrium if the vertical force, consisting of the applied load and the weight of the material, be balanced by the two forces exerted upon it by neighbouring voussoirs.

The action described is fully explained by Fig. 36, in which the arch is formed of the voussoirs A, B, and C, between the abutments N and Q.

Let it be assumed, in the first place, that the weight W on the centre voussoir is so great that the equilibrated polygon, or line of resistance, takes the form of two straight lines disposed like the principals of a roof.

If the superimposed weight be removed, the pressure at the joint between the voussoirs B and A, and the reaction between the voussoir A and the abutment N, will lie in one straight line which, meeting a similar straight line from the other abutment Q, will give an equilibrated polygon conformable with the required conditions.

If, however, the necessary horizontal force is not furnished by the abutments, the two forces at the joints between N and A and A and B will constitute a couple tending to rotate the voussoir A, so that the point of contact between N and A will be lowered, and the point of contact between A and B will be raised. A precisely similar action will occur in the case of the voussoir C, with the result that the weight can be balanced by a smaller horizontal force.

The rotation of the voussoirs A and C, together with the accompanying descent of the voussoir B, would clearly tend to force back the abutments N and Q, and consequently to increase their horizontal action if they were stable. If these abutments continued to yield under the thrust, the voussoirs A and B would continue to rotate until the points of contact reached the extremities of the curved surfaces. Therefore the horizontal thrust to be met by the abutments diminishes as the voussoirs rotate, and the structure will continue to support the load so long as the abutments N and Q are able to furnish the minimum thrust required for an equilibrated polygon intersecting the joints inside the ring, providing, of course, that the polygon does not intersect the joints at such an angle that the voussoirs can slip.

Looking at the matter in another way, if the abutments exercise horizontal pressure upon the voussoirs A and C, greater than is consistent with two lines of pressure passing through the points of contact, then the direction of the rotation of the voussoirs A and B will be reversed, and they will turn round so as to accommodate themselves to a position suitable for meeting an excessive horizontal thrust.

The altered position of the voussoirs, by permitting the forward movement of N and Q, will tend to relieve the horizontal thrust of the abutments, and the arch will not fail unless the points of contact reach the extremities of the curved surfaces, when failure will occur by the pushing-in of the sides and the squeezing-out of the centre voussoir B.

This result would not follow, however, with voussoirs of the shape shown in Fig. 36, because, before the final position could be reached, the points of contact would lie in a straight line corresponding with an infinite horizontal thrust.

Hence, whether the horizontal thrust furnished by the reaction of the abutments be too small or too great, the three voussoirs A, B, and C can rock in such a manner as to adapt the centre of pressure to the existing horizontal force, and a condition of stable equilibrium is always possible.

BOOKS RECEIVED.

ROMAN HAYLING. By Talfourd Ely, F.S.A. (Taylor and Francis. 5s.)

FREEHAND DRAWING AND ORNAMENT. By John Carroll. New and revised edition. (Burns and Oates. 1s. 6d.)

LAXTON'S BUILDERS' PRICE-BOOK FOR 1904. (Kelly's Directories, Ltd. 4s.)

INSTITUTION OF HEATING AND VENTILATING ENGINEERS.

THE annual general meeting of this Institution was held on January 19 at the Holborn Restaurant, when over fifty members and associate members signed the register. Mr. Louis F. Pearson, President for the past year, presided. Eleven new members and four associate members were elected.

The report and balance-sheet, showing a balance in hand of 58*l.* 19s. 1d., was passed, and the ballot for the Council resulted in the following being elected:—Messrs. W. Yates, C. Mason, T. Potterton, J. L. Saunders, J. N. Greenall, C. Barter, E. W. Mayner, A. B. Simpson, C. I. Haden, and C. T. O. Trotman.

Mr. Edward Taylor, Hon. Secretary, having asked to be relieved of some of his duties, was appointed Hon. Treasurer, and his son, Mr. Arthur Taylor, was elected Secretary. The Institution's silver medal was awarded to Mr. Walter Jones, and the bronze medal to Mr. F. Dye, for the two best papers read during the past year. Mr. J. Nelson Russell read a paper on "The Determination of Heating Surface," and Mr. A. H. Barker gave a paper on "Cost Keeping for Heating Engineers," and a most profitable discussion ensued on each paper. The prizes for the three best papers sent in during 1903 by any *bonâ fide* assistant, either clerk, draughtsman, or foreman of any heating engineer or manufacturer of heating goods, whether connected with the Institution or not, were awarded as follows:—Mr. G. Chasser (Stourbridge), first prize, 5*l.* 5s., presented by Mr. Louis F. Pearson; Mr. J. F. Hamer (Darlington), second prize, 2*l.* 2s., presented by Mr. J. Nelson Russell; Mr. N. K. Niness (Leeds), third prize), 1*l.* 1s., presented by Mr. A. B. Simpson.

It was decided to hold the summer meeting on July 19, time and place to be selected.

METROPOLITAN ASYLUMS BOARD.

THE usual meeting of this Board was held at the offices, Victoria-embankment, on Saturday last week. Among the correspondence received was a letter from the Local Government Board, forwarding copies of an order authorising the re-construction of the South-Eastern Hospital, at a cost not exceeding the sum of 135,200*l.*, and the borrowing of that amount, to be repaid in twenty years. The report of the Works Committee contained the following estimates of costs for the annual cleaning and painting works and repairs during 1904, at the undermentioned institutions. The estimates are those of the Engineer to the Board:—Brook Hospital, 2,200*l.*; North-Western Hospital, 344*l.*; Smallpox Hospitals, 270*l.* 10s.; Leavesden Asylum, 563*l.*; Darenth Asylum, 1,200*l.*; East Cliff House, 119*l.* It was agreed that the work should be carried out by contract in each case. On the recommendation of the same Committee, it was agreed to appoint Messrs. Thomas Dinwiddy and Sons, of Greenwich, as architects for the adaptation of Belmont Asylum. A number of contracts accepted will be found among this week's "Tenders."

ROYAL COMMISSION ON LONDON LOCOMOTION.

AT the sitting of the Royal Commission on London Locomotion on Thursday last week, evidence was given by Mr. Deputy Pryke, Chairman of the Bridge House Estates Committee of the Corporation. Replying to the Chairman, Sir David Barbour, the witness said that the total cost of building, freeing from toll, repairing, and rebuilding London, Southwark, Blackfriars, and the Tower Bridges had been, between the years 1760 and 1902, about 3,500,000*l.*, exclusive of annual maintenance. The Corporation was applying in the ensuing session of Parliament for powers to rebuild Southwark Bridge, at an estimated cost of 350,000*l.* The scheme involved the rebuilding of the bridge and piers, only the shore abutments of the existing structure being utilised. The width between the parapets would be increased from 42 ft. 6 in. to 60 ft. 6 in. The re-building would greatly improve the gradients—on the City side from 1 in 20 to 1 in 50, and on the south side from 1 in 23 to about 1 in 40.5. It was anticipated that the re-building of the bridge would result in a large increase of traffic over it, the present traffic being insignificant, owing to the steep gradients. During the last fifty years the Corporation had spent upwards of 6,000,000*l.* in effecting improvements within the City, mainly with the object of widening existing thoroughfares and building new ones for the accommodation of vehicular traffic. In his opinion, the introduction of tramways into the City would, to a great extent, nullify the benefit now derived from that enormous expenditure, by blocking streets already greatly congested with traffic. If the Corporation had the funds, he believed they would regard very favourably the provision of another bridge across the Thames, and his own opinion was that the best place for such a bridge was between Blackfriars and Southwark bridges. That would necessitate a new thoroughfare across Cannon-street down to the river.

Mr. Andrew Murray, the City Surveyor, gave evidence relative to the various street improvements which had been carried out by the Corporation. One of these was the Holborn Viaduct improvement, cost upwards of two and a half millions, and there was still a debt of 387,300*l.* outstanding on the work. The viaduct was 1,285 ft. long and 80 ft. wide; the carriage-way having a width of 50 ft. and the footways 15 ft. each; and it was opened by her late Majesty, Queen Victoria, on the same day as Blackfriars Bridge—November 6, 1869. Within a period of seventy years the Corporation, out of the City's cash, had contributed upwards of 1,200,000*l.* towards Metropolitan

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and City street improvements, in addition to voluntarily applying the proceeds of the 4d. coal duty towards the same objects. That duty produced between 1862 and 1890 a total of 3,100,602*l*. The Corporation had also spent nearly two millions upon its series of markets at Smithfield. The area covered by the market buildings was about 7½ acres, and employment was given to some 9,000 persons. Every facility had been given to the public to save time by making the approaches as wide and convenient as possible. The Metropolitan Cattle Market at Islington was removed from Smithfield in 1885, and stood upon a site of 75 acres. In connexion with the building of that market a number of new roads were laid out and maintained for many years by the Corporation as private roads. The Foreign Cattle Market at Deptford was built at a cost of over half a million in 1872. Shadwell Market was acquired by the Corporation under statutory authority in 1902, and they were considering a scheme for the widening of High-street, Shadwell, from an average width of about 27 ft. to 50 ft., and the laying out of new streets, and general improvement of the property, including the erection of artizans' dwellings. 140,000*l*. had already been spent on the market. Spitalfields Market had also been acquired by the Corporation, and they were considering a scheme for dealing with the present congestion of traffic there, which would necessitate the purchase of blocks of property, and would displace some hundreds of persons of the labouring classes. The provision of new dwellings for these persons might possibly necessitate the acquisition of further Parliamentary powers.

Questioned in respect to the suggestion that tramcars should run over Blackfriars and Southwark Bridges, witness said he was of opinion that the effect would be to entirely nullify the benefits intended to be created by the re-building of Southwark Bridge. In his opinion the introduction of such large vehicles as tramcars in any part of the City would tend to largely increase the congestion of vehicular traffic. New streets were required, or the widening of existing ones, but they necessitated the expenditure of large sums of money, while various interests were always affected, provoking opposition, which necessarily resulted in long periods of time elapsing before even one such improvement could be effected.

At a further sitting of the Royal Commission on Friday, Captain Nott Bower, Commissioner of the City Police, gave evidence, and stated that, notwithstanding street improvements, the majority of City streets, even under normal conditions, hardly afforded accommodation for the vehicles using them. He referred to the constant breaking up of the streets by various statutory companies, and suggested that the police should have power to say in what order streets should be broken up. He considered that the suggestion to bring a tramway along the Thames Embankment and across Blackfriars Bridge was a most inadvisable and injudicious one, and, if carried out, would introduce an added element of danger at Chatham-place. The tramway, if constructed, would serve no useful purpose other than that of bringing people across Blackfriars Bridge. The scheme, if sanctioned, would probably be used later on as an argument in favour of a more direct tramway route from south to north, viâ New Bridge-street, Ludgate-circus, and Farringdon-street, and the strongest possible opposition to this was felt, from a police point of view, as it would lead to a complete dislocation of the traffic, and cause very serious congestion. He had no objection to shallow underground tramways.

Superintendent Francis, of the City Police, endorsed the evidence of Captain Nott Bower. With reference to the suggestion that subways or bridges should be made at busy crossings for the accommodation of cross vehicular traffic, he felt the adoption of such a course would increase the existing evil, for drivers would not use a double slope if they could possibly evade it. He also considered that the provision of further subways for pedestrians would practically amount to a waste of money, having regard to the limited use made of the Mansion House subway.

ENGLISH PAVILION, ST. LOUIS EXHIBITION.—In mentioning this in our last issue, by a slip of the pen it was referred to as a reproduction of "the Orangery at Kew." It should, of course, have been "Kensington."

MEMORIAL TABLET, ROCHDALE.—The Mayor of Rochdale recently unveiled a memorial tablet affixed to the north wall of the Unitarian Church, Blackwater-street, Rochdale, in memory of Robert Bathe, M.A., the founder of the first Nonconformist church in the parish. The tablet has been executed in white marble and veined polished English alabaster by Messrs. Harry Hems and Sons, of Exeter.

GENERAL BUILDING NEWS.

ST. OSWALD'S CHURCH, WEST HARTLEPOOL.—The new Church of St. Oswald's, West Hartlepool, is 15th century in style, with a tower at the west end, a lofty nave and chancel of equal width, a range of seven four-light windows in the clearstory on either side, and a seven-light window at the east end. The extreme length of the church from east to west is 133 ft., and the width across nave and aisles 55 ft., sitting accommodation being provided for 800. It is built of stone, and the roofs are of pitch pine. The floors are of pitch pine blocks throughout. The chancel steps are of Languedoc and Pavonazza marble. The whole of the internal wood fittings are of oak. The reredos is of oak, having seven sculptured panels in high relief, the principal panel representing the Ascension, with detached figures on either side of the Blessed Virgin Mary and St. John the Baptist. The other panels represent the Nativity, the Epiphany, Baptism, the Agony in the Garden, the Crucifixion, and the Resurrection. Besides these there are painted panels with the twelve apostles, and below them again another set of twelve panels on which is painted the Apostles' Creed; there are also twelve sculptured angels in niches, all the sculpture being from the designs of Mr. J. Eadie Reid, the painted panels being both designed and executed by him. The sculpture is executed by Mr. Ralph Hedley, together with all the carved oakwork throughout the church. One of the features of the church is a rood beam with groining and tracery below, surmounted with a carved cross. The font is of alabaster, and is carved with eight figures in niches representing St. Ninian, St. Patrick, St. Columba, St. Aidan, St. Gregory, St. Augustine of Canterbury, St. Paulinus and Theodore of Tarsus. There are also eight small figures of angels in niches. The font is raised on three steps, the one immediately below it being of alabaster with carved risers. The font canopy is of oak and has four main posts, upon which it is supported, each of these posts being surrounded by figures representing St. Aidan, St. Paulinus, St. Oswald, and St. Edwin. Externally the western porches have figures of St. Oswald and St. Edwin in niches over the doorways. These last-mentioned figures are by Mr. C. W. Milburn, of York, the remainder of the stone carving and marble work being by Mr. R. Beall, of Newcastle. The church is lighted by electricity, the electric instalment and fittings being supplied by Mr. T. W. Hunter, of West Hartlepool. It is heated by hot water on the low pressure system by Messrs. Dinning and Cooke, of Newcastle. A peal of ten bells is being cast by Messrs. J. Warner and Sons, of London, and a clock is being made by Messrs. Thwaites and Reed, also of London. The east window is filled with stained glass from the studio of Mr. Herbert W. Bryans, of London, and also one of the windows of the morning chapel. The church was designed by the late Mr. W. S. Hicks, and has been completed under the superintendence of the present firm of Messrs. Hicks and Charlewood, of Newcastle-on-Tyne. The builders are Messrs. Thos. Dickinson and Son, of West Hartlepool.

THE NEWMAN MEMORIAL CHURCH, BIRMINGHAM.—The Duke of Norfolk presided on the 20th inst. at a meeting of the subscribers to the Newman Memorial Church in Birmingham, when a report was presented as to the financial position of the fund and as to the operations that have already been begun. It was reported that between 14,000*l*. and 15,000*l*. had already been received; and with this sum in hand a beginning has been made on the nave and side aisles of the new church, the completion of which is expected to cost about 11,000*l*. to 12,000*l*. The completion of the whole building is likely to cost from 25,000*l*. to 26,000*l*. Mr. Doran Webb, the architect, attended, and explained the nature of the design. The style is to be XVth century Roman. One of the features of the church will be twelve monoliths of old Breccia marble, said to be the largest monoliths ever imported into this country. On either side of the nave will open out six apsidal chapels, which will be floored in mosaic marble. The roofs of the halls are to be ultimately mosaic, but for the present will be left in rough concrete. The barrell roof is to be sweet chestnut, and all the exterior roof will be leaded. The height of the cornice, exterior and interior, will be 52 ft. The width of the nave is to be 33 ft., and its length 88 ft. The exterior length of the porch will bring it to 110 ft. This leaves the transept and naves still to be completed as the fund increases.

INLAND REVENUE OFFICES, LEICESTER.—New Inland Revenue, Probate, and County Court offices are being erected in Newark-street, Leicester. The offices in Newark-street will be used for Inland Revenue and Probate business, and the County Court offices will be situate in Upper Brown-street. This portion of the building will be completed first. Messrs. Bowles and Son are the contractors, and the architect is Mr. Hawkes, of H.M. Office of Works, London. The estimated cost of the building is between 7,000*l*. and 8,000*l*.

WESLEYAN CHAPEL, BIRCHGROVE, WHITCHURCH, NEAR CARDIFF.—The new Wesleyan Chapel in Birchgrove, near Cardiff, was opened recently. The building has been built at a corner site on Caerphilly-road, from the plans of Mr. Edwin Seward, Cardiff. It is designed with a view to its eventual use as a schoolroom, ground having been purchased in front of it where a larger chapel can presently be built. The building, which includes a chapel, classroom, and vestry, giving accommodation for 325, is of red brick, with Bath stone dressings, and was erected by Mr. S. Hanson, of Llanishen.

CHURCH, SKEWEN, GLAMORGANSHIRE.—A meeting of church-people of St. John's Church, Skewen, was held at the National School recently, to consider the erection of another new mission church on the Pentreffynon field. Plans were submitted by Mr. Halliday and approved of.

BUSINESS PREMISES, BELFAST.—New premises have been erected for Messrs. James Black and Co. in Great Victoria-street, Belfast. The building is of red brick, with dressings of stone from the Dumfries quarries. The general contractors for the work were Messrs. James Henry and Son, Belfast. Messrs. Wilson Bros. supplied the electric light installation, and Mr. John Dowling executed the plumbing work. The architect was Mr. Henry Seaver.

CAMPDEN HILL-COURT, KENSINGTON.—The contract for the erection of Campden Hill-court (Blocks D and E) has been secured by Mr. C. Gray, of Hampstead and Shepherd's Bush, W., at 56,100*l*., and the work has commenced. Messrs. Palgrave and Co. and Messrs. Rolfe and Matthews are joint architects.

BANK PREMISES, MIDDLEWICH.—New premises for the Birmingham District and Counties Banking Company, Ltd., at Middlewich, have been erected in Wheelock-street, and were opened on the 25th inst. The new bank has been built from the designs, and under the supervision of, Mr. Ernest E. Shepherd, architect, Nuneaton. The accommodation consists of bank and residence. The bank itself is on the ground floor, and at the rear of this are the manager's private room, strong room, and lavatory accommodation for the staff. The building is faced with Huncoat bricks and Hollington stone dressings. The main contract has been carried out by Messrs. Birchall Brothers, of Middlewich; decorating and lighting by Mr. O. Whitehead; the fittings, etc., in mahogany, by Mr. H. Cambridge; the grates and ironmongery by Messrs. Parsons, Sherwin, and Co.; and the lift by Messrs. Waygood and Otis. The total amount of the contract is about 2,100*l*.

CHURCH, CATFORD.—The Lord Bishop of Southwark laid the foundation-stone, on the 23rd inst., of St. Andrew's, Catford, S.E. The church is being built on the St. Germans Estate, from the design of Mr. P. Robson, the material being of red brick and Portland stone; the nave, which will accommodate about 1,000 worshippers, will cost about 8,600*l*.

CHURCH, CLYDACH.—A new church, costing over 8,000*l*., is to be erected at Clydach in connexion with the local St. John's Church, to accommodate its English congregation. Mr. E. Bruce-Vaughan, of Cardiff, is the architect of the new building, and the contractors are Messrs. Bennett Brothers, of Swansea.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, LENHAM CHURCH, LANCS.—A stained glass window has been placed in Lenham Church, Lancs., in memory of the late Rev. C. E. B. Nepean. Mr. H. Bryans, of Messrs. Bryans, Regent's Park, N.W., was the artist.

LOXTON, SOMERSET.—The west window of this 14th century church has been filled with stained glass, in memory of the late rector of the parish. The subject of the window is the Ascension, and it was designed and painted by Messrs. Hean and Maerchant, of London. The ancient stonework of the window was restored by Mr. Addicot, builder, under the supervision of Messrs. Price and Jane, architects, of Weston-super-Mare.

MEMORIAL WINDOW, HARBLEDOWN.—The west window of St. Michael's, Harbledown, has been filled with stained glass as a memorial window. The window consists of four main lights and several smaller ones in the upper part. The subjects which occupy the two centre lights are "Christ blessing little children" and the "Adoration of the Magi." The incidents illustrated in the two outer lights are, in the right-hand light, "Samuel before Eli," "Elijah raising the widow's son," and "St. Elizabeth teaching St. John the Baptist," and, in the left-hand light, "The finding of Moses," "The raising of Jairus' daughter," and "St. Ann teaching the Blessed Virgin." In the tracery above there are figures of angels.

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The details of the work are consistent with the style that prevailed in the Perpendicular period of Gothic architecture. The work was designed and carried out by Messrs. Lavers and Westlake.

SANITARY AND ENGINEERING NEWS.

DUST DESTRUCTOR, FELLING.—A new six-cell dust destructor and buildings are to be erected for the Felling Urban District Council, from the design and specification of their engineers, Messrs. Handcock and Dykes. The contract has been let to Messrs. Heenan and Froude at 8,699*l*. At their last meeting the Urban District Council resolved to apply to the Local Government Board to sanction a loan for the construction of this destructor.

LONDON SEWAGE AND PRECIPITATION OPERATIONS, 1903.—At Tuesday's meeting of the London County Council, the Main Drainage Committee submitted the following table, showing the quantities of crude sewage treated, chemicals used in precipitation, and sludge sent to sea, together with the quantity of refuse intercepted at the gratings at each of the outfall works at Barking and Crossness, during the year ended December 31, 1903:—

	Barking.	Crossness.	Total.	
Sewage treated	54,703,767,000	40,104,318,000	94,808,085,000	gals.
Daily Average	149,873,334	109,874,844	259,748,178	,,
Maximum daily flow	300,231,000	186,416,186	—	
Minimum daily flow	78,385,440	69,508,716	—	
Lime used	14,773	8,801	23,574	tons.
Proto-sulphate of iron used	3,280	2,308	5,548	,,
Sludge sent to sea	1,737,000	822,000	2,562,000	,,
Weekly average	33,404	15,865	49,269	,,
Refuse intercepted at gratings	3,856	940	4,796	,,

"From the above figures," it was stated, "it will be seen that at the Barking outfall one ton of sludge was extracted from an average of 31,493 gallons of sewage treated, as compared with 27,807 gallons in the preceding year, while at the Crossness outfall the average quantity of sewage treated to produce one ton of sludge was about 48,611 gallons, as compared with 42,922 gallons in the preceding year. The total quantity of sewage treated at the outfalls exceeded the flow in the previous year by 9,884,453,000 gallons."

CONSTRUCTION OF SEWERS, LONDON.—The Main Drainage Committee of the London County Council stated at Tuesday's meeting of the Council that they had sanctioned the construction of the under-mentioned local sewers, subject to certain conditions recommended by the engineer:—Battersea: 770 ft. of 12-in. pipe and concrete sewer in Carpenter-street, Culvert-road (reconstruction). Camberwell: 160 ft. of 12-in. pipe and concrete sewer in new road from Wyndham-road to Hollington-street. Lambeth: 356 ft., 350 ft., 340 ft., 400 ft., 500 ft., and 330 ft. of 12-in. pipe and concrete sewers in Anne, Agnes, Frances, Sutton, and Dolland streets and Broomgrove-road respectively (reconstruction); 270 ft. of 9-in. pipe and concrete sewer in Broomgrove-road (reconstruction); and 420 ft. of 12-in. pipe and concrete sewer in Hamilton-road (in substitution for sewer approved by the Main Drainage Committee on October 22, 1903). Lewisham: 450 ft. of 9-in. and 811 ft. of 12-in. pipe and concrete sewers in Fernbrook-road, Manor Park estate. Wandsworth: 395 ft. of 12-in. pipe and concrete sewer in Franciscan-road, opposite Moring-road, Tooting (in substitution for sewer approved by the Main Drainage Committee on November 26, 1903). Woolwich: 340 ft. of 12-in. pipe and concrete sewer in Grenadier-street, North Woolwich (in part substitution for sewers approved by the Main Drainage Committee on June 19, 1902).

FOREIGN.

FRANCE.—MM. Pascal, Vaudremer, Scellier de Gisors, Laloux, Moyaux, Raulin, Daumet, Loviot, and Bonnier have been elected by the Société Centrale des Architectes to form the architectural section of the Société des Artistes Français (Old Salon). ——M. Tony Robert-Fleury has been elected President of the Société, in place of M. Bonguereau, whose three years' term of office has expired. The new President, who is the son of M. Robert-Fleury, the former Director of the Ecole de France at Rome, is sixty-five years of age. He is the author of many pictures that have been highly thought of—"Le Dernier Jour de Corinthe," "Les Danaïdes," "Vauban à Belfort," etc. ——M. Saint-Anne Louzier has been elected President for 1904, of the Union Syndicale des Architectes Français.——The Société des Artistes Decorateurs has opened a very interesting exhibition on the ground floor of the Petit Palais, which will be open till February 16. Among the prominent exhibits are those of MM. Feuillâtre, Boutet de Mouvel, Massoul, Savine, Houillon, and Mdlle. Louise Abbema. There are also to be noticed the decorative schemes for rooms, etc., by MM. Sauvage, Lelievre, and Bigot ("une loge d'actrice"), a bedroom by M. Ott, a study by M. Follot, a drawing-room by M. Croix-Marie, and dining-rooms by M. Ducroq and M. Gallerey. ——At the Petit Palais there has also been arranged the first exhibition of historical and documentary photographs, organised by the Paris Municipality. The special subject of this exhibition is the various aspects of the Seine and its banks, the flower-markets, and the buildings of the XVIIth century.——At the exhibition of the Cercle Volney, now open, are some excellent works by MM. Gabriel Ferrier, Tattegrain, Dewambez, and Bonguereau.——The jury in the competition for the transformation of the Grand Hôtel have awarded the first premium to M. Lucien Beehmann, the second to M. Fugairon, and the third to M. Olivier Carré.——It is proposed to adapt the ancient dungeon at Vincennes, built by Charles V., for a historical museum.——It has been decided that the monument by M. Bartholdi to the aëronauts of the Siege of Paris should be erected on the large open space formed by the crossing of three avenues at the end of the Avenue des Ternes.——A large railway hotel is to be built at Troyes.——M. Labrouste has been commissioned to design a large hotel for Chamounix. ——It is proposed to undertake a new metropolitan railway line starting from the Invalides and following the line of the Grands Boulevards, returning to the Place de la Concorde by the Boulevard St. Germain.——The death is announced, at the age of 76, of M. Faure Dujarrie, a Government architect, and editor of the valuable reproduction of Du Cerceau's "Les Plus Excellents Bâtiments de France." He had been sub-Inspector under Duc for the works of the Cour de Cassation. In 1879 he was appointed architect to the Ecole des Ponts et Chaussées and to the Ecole des Langues Orientales, which he rebuilt. He was also architect for many private houses. He was created Chevalier of the Legion of Honour in 1884.

AUSTRIA.—A memorial of Mozart, in the shape of a fountain, is to be erected in Vienna; the sculptor is Herr Karl Wollek. Another monument in course of construction in Vienna is that to Johann Strauss, jun.——The restoration of the Cathedral of SS. Peter and Paul, in Brünn, has been undertaken by the architect August Kierstein, to whose plans the first premium was awarded. ——A new tower is to be built to the Church of St. Jacob, Prague.——The new viaduct at Eibenschitz is completed; the work has been entrusted to the firm of Anton Kunz. ——It has been decided to use part of the Samalov Gardens at Jungbunzlau as the site of the new theatre, for which a committee has been elected to select plans.——New Post Office buildings are also in course of construction.——The architect Heinrich Koschitz, well known both in Vienna and Berlin, died on January 6, in his fifty-fourth year.——The engineer Theodor Herzmansky died on December 5, in his fifty-sixth year.——The Vienna Town Council has granted a sum of 1,000 kreuzers to the committee which has been formed in connexion with a memorial to be erected to the artist Johann Martin Schmidt.

GERMANY.—The new Mechanical Laboratory in the Technical Schools at Brunswick has been recently opened; it consists of two large engine rooms and a two-storied building containing a lecture hall and living rooms for the resident engineer.——The engineer Dr. Friedrich von Hefner-Alteneck died at Berlin on January 7. The deceased was fifty-nine years old. His name will be perpetuated by his photometrical discovery called the "Hefner Light."

SWITZERLAND.—St. Michael's Church at Zug is completed. The architect is Herr Karl Moser; the capitals of the columns are carved after designs from Nature by the sculptors O. Kiefer, J. Hym, and W. Sauer. Herr H. Eichroot, painter, has also contributed several designs for mural decorations.——The Society of Arts at Lucerne has petitioned the Town Council either to build a museum in the west part of the town or to grant the Society the land, that it may use it for this purpose.

WAR MEMORIAL, ROCHESTER.—A memorial to Kentish soldiers and volunteers who fell in the late war was unveiled recently in Rochester Cathedral. Mr. W. D. Caröe, F.S.A., designed the work, Mr. F. N. Hitch, of London, executing it. The cost was 250*l*.

A FINE PIECE OF ILLUMINATION.—At Messrs. Zaehndorff's, Shaftesbury-avenue, there is on view for a few days a very beautifully illuminated copy of Milton's "Ode to the Nativity," by Miss Ibbs. The writing and illuminating, which are done on vellum, are very fine, and the binding is also a work of art.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —Mr. James Fotheringham Parker has been appointed managing director of the business of Messrs. Patman and Fotheringham, builders and contractors, of Theobalds-road, W.C., and Park-street, Islington.

COMPENSATION: WESTMINSTER IMPROVEMENT. —In the Westminster High Bailiff's Court, on the 21st inst., before Mr. John Troutbeck and a special jury, the case of Dunstall *v.* the London County Council came on for hearing. It was a claim for compensation for the compulsory acquisition of the leasehold interest in the premises 52, Millbank-street, S.W., required for the purposes of the Millbank improvement scheme. Mr. Lewis Coward, K.C., and Mr. Percival Clarke were counsel for the claimant; and the London County Council was represented by Mr. Edward Boyle, K.C., and Mr. Courthope-Munroe. Mr. Coward said his client was a coffee-house keeper, and the business had been established some twenty-four years. He held the premises under a twenty-one years' lease as from Midsummer, 1899, so that there were sixteen years unexpired. This new lease provided for a rental of 100*l*. per annum for the first ten years, and 110*l*. per annum for the remaining eleven. The claimant's net profits were agreed by the respondents to be 660*l*. per annum, but the jury would have to decide how many years' purchase he should have for having his business, which was practically a monopoly, entirely swept away. He claimed four years' profits, and the sum of 140*l*. had been agreed upon as the value of the fixtures, utensils, etc. Mr. Boyle contended that one year's purchase of his net profits and a sum of about 300*l*. would amply compensate the claimant, who would at once set up in business elsewhere. The jury, without leaving the box, awarded the claimant 2,500*l*., to include everything.

WORKMEN'S DWELLINGS, SWANSEA. — The Swansea Borough Surveyor was recently entrusted to prepare specifications, etc., with respect to the erection of workmen's dwellings at Gibbet Hill. The Housing of the Working Classes Committee have now approved of a modified scheme. As at present arranged, the following are the dimensions of the different rooms:—Ground floor, front room, 13 ft. by 11 ft. 9 in.; living-room, 15 ft. by 11 ft.; scullery, 9 ft. by 8 ft.; with usual out-offices and a pantry under the stairs. Upstairs, front bedroom, 15 ft. 3 in. by 13 ft.; back bedroom, 12 ft. 3 in. by 11 ft.; bedroom over scullery, 9 ft. by 8 ft. The house will have a small fore-court, and the houses pitched up, so as to diminish the cost of excavation. The depth of the houses from front to back will be 80 ft. The fronts up to the first floor will be bricks, and then rough-cut or stucco work above, with double Roman tiles on the roof. Hot and cold water will be available in the scullery.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Bristol Master Builders' Association took place, on the 19th inst., at the Royal Hotel, College Green, under the Presidency of Mr. A. Dowling. The loyal toasts having been suitably honoured, Mr. Frank N. Cowlin gave "The Lord Mayor and Corporation of the City of Bristol." Speaking of streets improvements, Mr. Cowlin reminded the company that recently some property was sold in Bristol at a figure higher than that fetched in the heart of London. Little chance had been given hitherto for the display of street architecture. He wished the city authorities would formulate a comprehensive scheme of streets improvements. There were practically only three important thoroughfares. He could see his way to making a fine new street from Park-street to the railway station; to the improvement of property in Marsh-street; to erecting new municipal buildings in the neighbourhood of Queen-square; and to the development of property in Old Market-street. Bristol was worthy of the traditions of the past, and in time would become again one of the greatest cities of the greatest empire in the world.—Alderman Godwin, in response, said he was of opinion that they had their work cut out to make the new docks remunerative. The way to accomplish that was by inducing railway companies to give favourable through rates. Respecting streets improvements, the speaker said that, although he would like Corn and Clare streets widened, the cost would be enormous, and made it impossible. In other parts of the city they might be carried out with advantage. In what they did they must count the cost. Their debts were growing enormously.—Councillor Parsons said he was opposed to the views of the alderman in regard to the extension of the boundaries. When they first went to Parliament they did not get the extension they ought to have had. Now they were going to Parliament with another scheme, which was of an important and serious character. Bristol was spending enormous sums of money at Avonmouth on dock extension, buying land, and increasing the value of

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property. It would, therefore, be unfair for that to go to the Gloucester County Council; but it should accrue to the benefit of Bristol, which was spending the money.—Councillor Bastow also replied.—Mr. W. F. Long (Secretary of the South-Western Federation) proposed "The Trade and Commerce of Bristol," and Mr. W. M. Edwards (President of the Chamber of Commerce) replied.—Mr. Neale gave the toast of "Architects and Surveyors," and said that no flourishing centre of industry could possibly go on without its architects and engineers for long. Alterations and additions were constantly required to keep pace with the growth of prosperous businesses. Mr. Neale coupled with the toast the names of Mr. Frank Wills, Mr. W. P. Saunders, and Mr. A. P. I. Cotterell.—Mr. F. Wills replying, said that he firmly believed that a better spirit existed among architects and contractors at present than ever before. More confidence was shown each other, for both appreciated more fully the difficulties that had to be overcome, and, as a result, differences were settled with greater facility than hitherto. He desired to explode the idea that existed in the minds of the public that low contracts were sent in that the bill might be swelled by means of extras.—Mr. W. P. Saunders and Mr. A. P. I. Cotterell also replied.—Mr. W. H. Brown proposed "The National and South-Western Federations and Kindred Associations," and spoke of the unfairness of the terms of many contracts in years past, which made it needful for a common form of contract to be adopted. It was a matter for thankfulness that the Corporation of Bristol had agreed to a form of contract acceptable to them all. In framing it, the Town Clerk had met him and other officers of the Association in a most friendly and conciliatory spirit. A form of contract had also been arranged between the Royal Institute of British Architects, the Institute of Builders, and the National Federation. Such results could not have been obtained but for the existence of that Association. He urged upon builders the necessity of putting the best work into the tenements they constructed for the middle class and artisans, and of providing plenty of light and air and sanitary improvements.—Mr. J. B. Mercer (Secretary of the Bath Master Builders' Association) responded.—Mr. A. Krauss, who also replied, said it was just a little more than five and twenty years since the National Federation was started, and much good work had been done by it. They had considerably improved their position of late years. One of the great features was that they had a national contract form now in existence which was fair between architect and builder, which contract form it took nearly twenty years to get. The financial position had also greatly improved. The relations between architect and builder were now very harmonious, and better than they ever had been; and those between the master builders were very much warmer. The Board of Trade returns from employers' associations showed that employment was good with 4 per cent. of the workpeople, fair or moderate with 18 per cent., and dull or bad with 78 per cent. That compared unfavourably with last year. Kindred associations did not affect them a great deal in the west. That applied more to the north of England. At the time when he held the office of President of the National Association he had great hopes of getting the kindred associations—master plasterers, master painters, master plumbers, etc.—affiliated with them. It fell through, however, at the last moment.—Councillor C. Newth submitted "The Bristol Master Builders' Association," to which the President and the Hon. Treasurer replied; and the new President was introduced.

LONDON UNIVERSITY.—We have received a copy of the "London University Guide and University Correspondence Calendar," which gives all information as to degrees and the carrying on of courses of instruction by correspondence. Architecture does not appear to be included in the programme, but degrees in engineering are given. In this subject the examinations successively open to those who have matriculated or registered as students are:—(1) Intermediate Examination in Science (Engineering), (2) B.Sc. (Engineering), (3) D.Sc. (Engineering). The Intermediate Examination takes place in July, the B.Sc. in October. The fee for each of these two examinations is 5*l.*; for the D.Sc. (Engineering) it is 20*l.* The regulations can be obtained from the External Registrar of the University, South Kensington, S.W.

STORM FLOODINGS.—A conference of delegates of Borough Councils north of the Thames was held, on the 20th inst., at Paddington Town Hall, the Mayor, Alderman J. Williams, presiding, to consider the subject of periodical storm flooding north of the Thames consequent upon inadequate main drainage. Representatives of Paddington, whose Council convened the conference, of Fulham, Hammersmith, Hampstead, Islington, Kensington, Marylebone, and Stoke Newington were present. After discussion it was unanimously resolved, on the motion of Councillor Bryen, seconded by Alderman Tomkins, both of Islington, that the conference "viewed with alarm and regret the great delay of the London County Council in giving effect to their engineer's reports of 1891 and 1899 dealing with the question of the main drainage of London, and urged upon the Council the necessity, in the interests of public health, of pressing forward the work already in hand, and taking steps to at once construct the new intercepting sewer for flood waters from Paddington to Old Ford between the high and middle level sewers recommended in 1891, and the new sewer between the middle and low level existing sewer, as recommended in 1899 by Sir Alexander Binnie, and such other further works as may be necessary for preventing the storm floodings in the whole of the boroughs north of the Thames." Further, it was decided that the members of the conference, with the addition of delegates from other Borough Councils north of the Thames, should seek an interview with the new County Council as early as convenient after the March election. The Mayor of Paddington, who was appointed spokesman for the deputation, said he felt very keenly the ruin of poor tenants and the depreciation of property and rents which had been wrought by the long delay in providing adequate main drainage and preventing these periodical floodings of basement premises in so many parts of London north of the Thames.

WAR CORRESPONDENTS' MEMORIAL.—The Institute of Journalists are carrying out the arrangements for placing in St. Paul's Cathedral a memorial to the war correspondents who lost their lives on service in the South African war. The Dean has selected a site for the proposed tablet on one of the arches in the crypt, immediately opposite the memorial to the Soudan correspondents, and next to the Archibald Forbes memorial. Mr. W. Goscombe John, A.R.A., has undertaken to prepare the design.

INCORPORATED CHURCH-BUILDING SOCIETY.—This Society held its usual monthly meeting, on Thursday, the 21st inst., at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz., building new churches at Ben Rhydding, near Ilkley, Yorks., 225*l.*, in lieu of a former grant of 200*l.*; Foulridge St. Michael and All Angels, near Colne, Lancs., 100*l.*, in lieu of a former grant of 55*l.*; Hilderthorpe Emmanuel, near Bridlington, Yorks., 80*l.*, in lieu of a former grant of 40*l.*; Northampton, Christ Church, 200*l.*, and Plymouth St. Augustine, 75*l.*; towards rebuilding the churches at Swinefleet, St. Margaret, Yorks., 40*l.*; and Walthamstow St. James the Greater, Essex, 230*l.*, in lieu of a former grant of 130*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Bettws Evan, St. John, near Newcastle Emlyn, Cardigan, 20*l.*, in lieu of a former grant of 15*l.*; Brandon, St. John, Durham, 50*l.*; Brereton, St. Oswald, near Sandbach, Chester, 25*l.*; and Great and Little Hampton, St. Andrew, near Evesham, Worcester, 35*l.* Grants were also made from the Special Mission Buildings Fund towards building mission churches at Becton-road, Canning Town, near Plaistow, Essex, 35*l.*, and Hordle, near Brockenhurst, Hants., 40*l.* The following grants were also paid for works completed:—Mumby, St. Peter, near Alford, Lincs., 20*l.*; Pockthorpe, St. Mary Magdalene, near Norwich, 100*l.*; Rogiet, St. Mary, near Newport, Mon., 30*l.*; Llanllyfni, St. Rhedyw, near Penygroes, North Wales, 15*l.*; Alwalton, St. Andrew, Peterborough, 15*l.* of a grant of 25*l.*; Godney, Holy Trinity, near Wells, Somerset, 25*l.*; Tremaine, Cornwall, 15*l.*; Tonyrefail, St. David, near Llantrisant, Glamorgan, 130*l.*; Stourton, St. Thomas à Becket, near Bridestowe, Devon, 10*l.*; Badshot Lea, St. George, near Farnham, Surrey, 75*l.*; and Aldersbrook, St. Gabriel, near Wanstead, Essex, 50*l.* In addition to this the sum of 239*l.* was paid towards the repairs of eighteen churches from Trust Funds held by the Society.

RIPON SPA BATHS AND STREET WIDENING.—At the Town Hall, Ripon, on the 21st inst., Mr. R. H. Bicknell, M.Inst.C.E., an Inspector of the Local Government Board, held an inquiry with respect to an application by the Corporation to borrow 2,250*l.* for purposes of street improvements and 5,300*l.* for the erection of baths in Park-street in connexion with the Spa scheme, these amounts having since the application was made been increased respectively to 2,350*l.* and 6,000*l.*

YORKSHIRE FEDERATION OF BUILDING TRADE EMPLOYERS.—The annual dinner of the Yorkshire Federation of Building Trade Employers was held, on the 21st inst., at Hull, under the presidency of Mr. E. Good, Hull. The attendance included the Mayor (Alderman Jarman), the Sheriff (Mr. J. H. Fisher), the ex-Mayor (Sir Alfred Gelder), Mr. F. Bielby (President of the Hull branch), Alderman Larard (Chairman of the Corporation Works Committee), and a large number of the building employers of Hull and the district. Sir Alfred Gelder, in proposing the toast of "The National Association," said he believed the builders had good times before them.—Alderman Jessop (Huddersfield) responded. He said he had no sympathy with Yankee hustling in the building trade.

ELECTRICAL WORKING OF TRAMWAYS.—The Highways Committee of the London County Council reported as follows at Tuesday's meeting of the Council:—"We have to report that the reconstruction for electrical traction of the tramways (*a*) between the Elephant and Castle and Greenwich, *viâ* New and Old Kent roads, New Cross-road, etc., and (*b*) between the Elephant and Castle and New Cross-gate, *viâ* Walworth-road, Camberwell-road, Peckham-road, etc., has been completed, and the Board of Trade has, in the exercise of the powers conferred upon it by the London County Tramways (Electrical Power) Act, 1900, and the London County Council (Tramways and Improvements) Acts of 1901 and 1902, consented to, and approved of, the use of electrical power on those lines. The Board of Trade has also certified that the tramway in Short-street, between Newington-butts and Walworth-road, which has been reconstructed as a double line, under the London County Council (Tramways and Improvements) Act, 1901, and the junction line of Tramway No. 15 from Camberwell-green to Denmark-hill, authorised by the London County Council (Tramways and Improvements) Act, 1902, are fit for public traffic. . . . The tramways between the Elephant-and-Castle and Greenwich, *viâ* New and Old Kent roads, etc., have been opened to the public, but, owing to certain arrangements with reference to the housing of the cars not being yet completed, it has not been found possible to commence the electrical working of the tramways between the Elephant and Castle and New Cross-gate, *viâ* Walworth-road, etc. It is hoped, however, that these lines will be open to the public in the course of a few days. . . ."

HOUSING OF THE WORKING CLASSES.—The Housing of the Working Classes Committee reported as follows at Tuesday's meeting of the London County Council: "On April 29, 1902, we reported that certain factories were about to be erected on a site formed by the junction of Shepherdess-walk and Nile-street, Shoreditch, and that this would involve the displacement of 364 persons of the working classes. We have now to report that twenty-five additional houses, accommodating about 198 persons, have been included in the clearance. Of the total number of persons, 245 have already been, and 317 will shortly be, displaced. Sites are also being cleared for the erection of commercial premises in Scrutton-street and Earl and Clifton streets, Shoreditch, involving the displacement of sixty-nine and 115 persons of the working classes respectively. In the Metropolitan Borough of St. Marylebone, closing orders have been obtained under Part II. of the Housing of the Working Classes Act, 1890, in respect of nineteen two-roomed cottages in Bentinck-court, Portland-town. Of these cottages, five were unoccupied when the closing orders were obtained, and the remaining fourteen were occupied by seventy-three persons. In the Metropolitan Borough of Finsbury nine houses in Providence-place, Baker's-row, inhabited by forty-eight persons, have been closed by the owner on account of their insanitary condition. Displacements have also been made by the War Office in Artillery-place and the adjacent streets in Woolwich for the purposes of erecting quarters for married soldiers. The total number of persons displaced was 468, of whom 273, occupying sixty houses, were of the working classes. We are informed that no great difficulty has been experienced in finding accommodation for the persons displaced. . . . We have to report that the whole of the cottages on section A of the Totterdown Fields estate, comprising eleven first, sixty six second, 151 third, and sixty-four fourth class cottages, have been completed, and, with the exception of two, are now in occupation. We have ascertained that 129 of the 289 tenants in possession on December 31, 1903, were in employment on the north side of the river Thames, which was, no doubt, mainly due to the convenience of the electric tram service. We also ascertained that 107 of the tenants had moved from Wandsworth, thirty-five from Lambeth, thirty-one from Southwark, twenty-seven from Camberwell, twenty-one from Battersea, fourteen from Westminster, and of the remaining fifty-four thirty came from other Metropolitan boroughs, and twenty-four from various places outside the County of London."

DUBLIN MASTER BUILDERS' ASSOCIATION.—The annual general meeting of the Master Builders' Association was held at the Grosvenor Hotel, Westland-row, recently, when the following officers were elected for 1904:—President, James Beckett; Vice-President, James Kier-

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nan; Committee, R. Denne Bolton, Thomas Connolly, J. E. Foley, Thomas Mackey, Wm. Meade, H. Pemberton, E. W. Warren, and B. W. Whyte; Hon. Secretary, John Good, 55, Great Brunswick-street, Dublin. The date of the annual dinner was fixed for February 11 next, at the Antient Concert Rooms.

SLATE TRADE.—The year 1903 was a prosperous one for the slate trade, prices being the highest ever reached, and prospects for the present year are good, especially with the export trade. There was a large increase in the importation of foreign slates (principally from the French ports), amounting to about 400,000*l.* worth, as compared with 286,000*l.* worth the previous year, but the increasing supply of superior quality of Welsh slates will soon displace them. The owners of quarries on the Bangor and Festiniog veins are in much the same position as the South Wales steam coal owners, having practically a monopoly of a product superior to any other in the market. The introduction of electric power by the North Wales Power Company will help to lower the cost of working. A few quarries have changed hands, and new companies been formed, as the present state of trade is bound to attract investors. Little is, however, heard of the profits of the slate trade, as the best paying quarries are in the hands of private owners or companies, the shares of which are not quoted.

Legal.

WEST END ANCIENT LIGHT DISPUTE.

THE case of Godson and others *v.* Robinson and others came before Mr. Justice Farwell in the Chancery Division last week, the hearing having concluded on the 23rd inst.

This was an action for an injunction restraining the defendants, their servants and agents, from erecting any building on the site of No. 5, Stafford-street, Piccadilly, in such a manner as to darken, injure, or obstruct any of the ancient lights or windows of the plaintiffs' house, No. 16, Dover-street, Piccadilly, as the same were enjoyed prior to the demolition of the old building, and for a mandatory order to pull down so much of the building as was erected above the height of the old building, and for damages.

Mr. Upjohn, K.C., and Mr. H. C. Wright appeared for the plaintiffs; and Mr. C. E. Jenkins, K.C., and Mr. J. Rolt for the defendants.

The first plaintiffs are the owners of No. 16, Dover-street, and Mrs. E. Betty, the third plaintiff, is the lessee of the premises, where she carries on the business of a milliner and dressmaker on the first, second, and third floors. At the rear of the premises, viz., on the south-eastern and north-eastern sides, there was an open area, and this open area was bounded on the north-western and south-western sides by the walls of No. 16, Dover-street, and on the south-eastern side was bounded throughout by the outside wall of No. 5, Stafford-street. The surface of the area was held with No. 16, Dover-street, and, as to the ground part, consisted of a flat forming the roof of the basement of that house, but at the south-western end was open to the basement. There were a number of windows in the rear of No. 16, Dover-street, looking towards the defendants' building, and all these windows were ancient lights, and received light over No. 5, Stafford-street, which had been the case without interruption and free from obstruction, except from the building which formerly stood there. The defendants Robinson and Fisher were the owners of No. 5, Stafford-street, whilst Smith was the contractor for the new building. The old building had been demolished, and a new building put up higher than the old building, and with chimney stacks which, it was alleged, obstructed the plaintiffs' lights as hitherto enjoyed. It was further alleged that, having regard to Mrs. Betty's business, the diminution of light was of serious importance to her, and the result of the erection of the defendants' building had already been to render the plaintiffs' building less commodious and convenient for business.

The defendants, by their defence, admitted that the plaintiffs' windows were ancient lights. They denied the other allegations of the plaintiffs, affirming that their new building did not obstruct the light entering the plaintiffs' premises. Defendants further said that, prior to the commencement of their new building, plans and drawings were submitted on behalf of the defendants to, and approved by, the surveyor and agents of the plaintiffs, and plaintiffs allowed the building to proceed with full knowledge and notice of the nature and details of the building. In these circumstances the defendants said that plaintiffs were not entitled to any relief, or a mandatory order.

Technical evidence was given for the plaintiffs by Professor Elsey Smith and Mr. W. Newton Down, and for the defendants expert evidence was given by Mr. Treadwell and Mr. Worley.

In the result, his Lordship, in giving judgment, said he did not consider the obstruction of a serious nature, and that damages would meet the justice of the case. He awarded the plaintiffs 150*l.* damages, viz., 100*l.* to the reversioners and 50*l.* to the tenant, with half costs.

HARROGATE BUILDING DISPUTE.

THE case of the Mayor and Corporation of Harrogate *v.* Dickinson came before the Court of Appeal, composed of the Lord Chief Justice, the Master of the Rolls, and Lord Justice Romer, on the 22nd inst., on the appeal of the defendant from a judgment of Mr. Justice Wright, sitting without a jury, in the King's Bench Division.

From the special case stated, it appeared that the defendant was a builder who owned a plot of land in Walker-road and Bilton-drive, Harrogate. On October 1, 1894, he deposited plans showing eleven dwelling-houses and two stables and coach-houses proposed to be erected by him on the plot of land referred to. These plans, which were contained on one sheet, were approved on October 8, 1894, and certificates were given in respect of certain of the houses which were built. Section 27 of the Harrogate Corporation Act, passed on August 24, 1893, provided: "The deposit with the Corporation of any plan of any street or building shall be null and void if the execution of the work specified in such plan be not commenced within the following periods—that is to say, as to plans deposited after the passing of this Act within three years from the date of such deposit, and as to plans deposited before the passing of this Act within three years from the passing of this Act; and, at the expiration of these respective periods, fresh notice and deposits shall, unless the Corporation otherwise determine, be requisite." On January 3, 1902, defendant commenced to build the second stable and coach-house, and on the 18th the inspector employed by the Corporation gave him notice that he was to discontinue building and deposit fresh plans, the old ones not complying with the new by-laws in several particulars. The defendant's case was that, subject to the section of the Act of 1893, he was entitled to continue to build under the by-laws which were in force at the time when the plans were passed, because of the last clause of the new by-laws, clause 117, which said that from and after the date of the confirmation of the new by-laws all by-laws relating to new streets and buildings were repealed, except as regarded any work commenced before the date of the confirmation, or any work not so commenced, but of which plans had been either approved before that date or had been sent to the Surveyor one month before such date and not disapproved by the Council. Mr. Justice Wright held that what the Council had had before them were several plans, and not one plan, and that section 27 of the Act of 1893 expressly provided that deposited plans became null and void after three years. As regarded the particular houses now in question, the three years having been allowed to lapse without anything being done upon them, judgment must be entered for the plaintiffs. From this decision the defendant now appealed.

Mr. Colefax appeared for the appellant, and Mr. Danckwerts, K.C., and Mr. Wm. Mackenzie for the respondents.

Without calling upon counsel for the respondents, their lordships affirmed Mr. Justice Wright's decision on all points, and dismissed the appeal, with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

23,960 of 1902.—L. H. RANSOME: *Wood-boring Machines.*

This consists in making the top bracket or brackets of wood-boring machines carrying the boring spindle or spindles to slide on balls, thereby reducing to a minimum the labour required to traverse and bring the spindle into its required position.

3106 of 1903.—W. K. KAYE: *Locks for Asylums and other Public Institutions.*

In carrying out this invention, the striking-plate is so constructed that one side of the frame—that is to say, the side in the direction in which the door opens—is attached to the main body of the same either by wedge-shaped catches or by one edge of the said removable part sliding in a groove, a catch holding the removal part in position. An electro-magnet or magnets are arranged in connection with the before-mentioned catches in such a manner that on completing the circuit by the operating of the switch of a lock or a series of locks, the removable part of the striking plate will fall bodily away, or slide downwards, on the application of ordinary pressure to the door.

4421 of 1903.—H. T. DAVIDGE: *Locks and Keys for Doors, Cupboards, and the like.*

This relates to a lock, comprising a locking-bolt actuated by a follower and handle secured in the locked and unlocked positions by means of spring-controlled sliders or tumblers, the gates of which are brought into register with a stump on the bolt when it is desired to actuate the bolt by means of a key.

5248 of 1903.—E. G. HARCOURT: *Cupboard and like Fastening Devices.*

This invention relates to cupboard and like fastening devices, particularly to the type known as "cupboard turns," the object being to provide the means for locking the tongue part to the handle stem or shank. The means aforesaid comprise, in combination with the tongue part itself, a slide adapted to engage or embrace the handle stem or shank for preventing rotation of the same independently of the tongue.

7362 of 1903.—E. ENGELS: *Method and Apparatus for supplying Fuel to Stoves or Fireplaces.*

This consists in the combination of a grate, a fuel support below the grate, means to feed the fuel into the grate, and means for preventing excessive frictional interference by the lateral pressure of the fuel.

7788 of 1903.—J. JETON: *Holders for Windows, Fanlights, Doors, and the like.*

This consists in the combination with a fixed member and a hinged member, of a support attached to each of said members, a holding bar pivotted to the fixed member support, and adapted to slide in the hinged member support, and provided with apertures and a ball race, a spring pressed ball arranged in said hinged member support, and adapted to enter said apertures and the race, a spring in connection with the holding bar, and bearing on the support of the hinged member to close the latter, and a rod adapted to guide said spring.

22,489 of 1903.—W. BETTIS: *Revolving Cowls for Chimney Pots and the like.*

This invention relates to revolving cowls for chimney pots and the like, and has for its object the prevention of downdraught, thereby obviating the annoyance experienced in a room where such occurs. This object is attained by an improved form or shape of vanes used in the construction of the fan or revolving cowl. In carrying the invention into effect, an oil-retainer provided at its upper end, with a bush, is formed to act as a side support to a spindle that is pivotally mounted and kept in position by a set screw which fits into a groove formed in the spindle. On the said spindle is fixed a boss provided with arms or extensions as a means for carrying vanes which are fixed thereto. The said vanes are formed more or less with one of the outer triangular corners extending upwards in a gradual curve, while the other outer corner is finished off with a more or less small semi-circular curve. To enable a revolving-cowl and bearing as above described to be attached to a chimney pot, a flat bar of metal of sufficient length to stretch across the top of the chimney pot is secured to the lower end of the oil-retainer, and to the said bar are attached by any suitable means, thin, pliable strips of metal capable of being bent over the top and down on the outside of a chimney pot, and secured thereto by means of wire bindings.

25,126 of 1903.—T. W. PATSON: *Hasp Locks.*

A hasp lock, in which the bolt is normally held by a spring in a position to engage the hasp loop while it can be drawn back to release the loop by sliding the nozzle, which, in the interior of the lock carries a nozzle plate, so that a tooth thereon engages in the forward end of an additional slide plate, which latter engages in a pin projecting from the bolt plate and draws back the bolt, while, at the same time, by the operation of the key passed through the nozzle, the bolt may be slidden beyond its normal position to pass entirely through the hasp loop by the key lifting the ordinary lock levers out of engagement with the bolt plate and sliding the bolt, one of the levers lifting the forward end of the slide plate, which is simultaneously slidden with the lock plate, so that a rearward notch in the slide plate engages the teeth of the nozzle plate and prevents the nozzle being slidden by reason of the lock levers descending and bringing with them the slide plate, so holding the locking bolt in its fastening position.

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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2467 of 1903.—J. JACKSON: *Columns Supports, Bearers, or Stanchions, and the like.*

This invention has for its object to obtain the full advantage of the higher resistance to crushing strains of cast iron, while, at the same time, obviating the risk due to hidden flaws, inequal contraction, displaced cores, and unnecessary weight in tubular or other cast columns and stanchions. To form these columns, wrought iron or mild steel of channel or other section is taken, and by means of rivets or bolts, cast iron so affixed thereto of any section or shape which may have caps, bases, brackets, and the like cast thereon, or the same may be affixed thereto by means of rivets, bolts, screws, or the like.

4005 of 1903.—C. GOULD and J. H. SUTTON: *Ventilators.*

Ventilators for buildings of all kinds, consisting of a series of shutters, having extended parts, said shutters being pivotally attached within a frame of sheet steel or other metal, or material by pivots or snugs, or rods, said shutters being provided with quadrant ends integrally a part of or attached to same, a lever rod or bar attached to said quadrants, and situated above one or both ends of each shutter, said shutters forming a series to be manipulated by a lever handle, or by a finger-piece simultaneously relative to the opening and closing of same.

4215 of 1903.—T. DAWBER: *Lubricating Rollers for Brick-making Machinery.*

A lubricating roller for brick-making machinery, consisting of a central hollow supporting piece, in combination with a periphery formed of one or more layers of porous material and a stiff, perforated sheet as a support for same.

4457 of 1903.—E. B. ELLINGTON: *Hydraulic Lifts.*

Apparatus for operating a hydraulic lift, in which the main valve is controlled by a rope or ropes outside the lift, the controlling rope or ropes being moved by means of a lever inside the lift connected to a rocking yoke moving with the lift, and carrying one or more pulleys, round which the controlling rope or ropes pass.

6505 of 1903.—E. HOMAN: *Fireproof Floors, Ceilings, or the like.*

A fireproof structure, consisting of a series of girders or the like, arranged parallel to one another, and having holes formed in the ropes thereof at suitable intervals, a series of tie bars or rods passed loosely through the holes, said tie bars being of a length to extend across a group of two or more adjacent girders and project beyond the same into adjacent bays or spaces, and alternately arranged across every group of girders, and embedded in a filling of concrete embracing the tie bars and the girders.

9476 of 1903.—F. BIRD: *Ventilating Columns for Sewers and the like.*

This invention relates to ventilating columns for sewers and the like, and refers more particularly to a form and arrangement of "rust pans," which are mounted within the base of the column as follows: Within the base of the ventilating column is formed a suitable chamber of sufficient depth beneath the ground line to enable the handle of the rust pan, resting upon the floor, to be readily reached from the manhole, which is fitted with a door or cover fastened to the wall of the column by set screws, and rendered air-tight by means of an indiarubber or like washer. To ensure a clear and uninterrupted air way, the shape of the rust pans are such as to form to the interior contour of the chamber, and that the lower one is placed in line with, but below, the opening connecting with the sewer. The upper rust pan is fitted with lugs, and held in position by two hooks inserted in, cast with, or fastened upon the wall of the chamber, but so that, while part of it projects over the lower pan, and thus ensures the collection of the whole of the rust, dirt, or other *debris*, the required area of the air way from the sewer is preserved.

20,822 of 1903.—P. M. WALKER and E. BARSDORF, trading as P. M. WALKER AND CO.: *Ventilators.*

The ventilator is formed with a round, square, or other suitable shape of base, and situated round the uptake is arranged a number of curved plates or vanes, partly corresponding in section with the said uptake. The sides of these vanes curve outwardly, leaving a space or outlet between each pair of vanes, and where four vanes are used there are four of these outlets, occupying quadrangular positions. A V-shaped vertical mid-feather is placed in each of the aforesaid spaces, having wings at their bases curving outwards; the spaces between the conical sides of this mid-feather and the curved sides of the vanes serve as air passages. Upon each side of these air outlets is placed suitable deflecting fans, and across these outlets, but at a suitable distance beyond, suitable curved baffle-plates are erected.

22,995 of 1903.—H. X. SPILLMANN: *Apparatus for indicating and recording the level or contour of roads and the like.*

A level or contour indicating or recording apparatus for use in a vehicle or the like, of which a device connected with a registering-pin is pivotally applied to the vehicle in such a manner that at the movement of the vehicle it can automatically retain its original position relatively to two axes drawn through a point of the latter, of which one is perpendicular and one is parallel to the direction of the wheel axle, and, further, in which means are provided for causing a registering or recording band to travel in front of the registering-pin, according to the amount of road or distance passed over by the vehicle in such a manner that said pin can press on such band and form a curve showing the difference in height or contour of the road traversed.

23,132 of 1903.—R. AMES: *Tiles for the Floors of Bacteria Beds and other Filter Beds.*

Tiles for forming the floors of filter beds for various purposes, consisting of arched or other suitably-shaped block or foot, or feet, made integral with, and supporting, a rectangular flat top, the edges of which project beyond the said block or foot, and are corrugated or wavy in outline so as to form drainage channels between each adjacent tile when in use.

25,160 of 1903.—J. G. WOLF: *Paving Block or Setts for Use along the Rails of Tramways.*

A paving block, made of natural stones, broken stones, or quarry stones and cement, beton or concrete, consisting in the arrangement of iron or steel banding around lateral faces of the block and of an angle iron disposed over an upper edge of the block and secured to one or more of the iron or steel bands, for use along the rails of tramways.

25,321 of 1902.—R. MCALPINE: *Composition of Building Blocks, Slabs, and the like.*

The manufacture of building blocks, slabs, and the like, consisting in incorporating and mixing steel slag with Portland cement and other cement.

25,652 of 1903.—R. WUNSCH: *Artificial Stone Girders, and the like.*

The upper and lower flanges of the girder are provided with longitudinal cores, made of round iron bars or of angle or other iron, a frame, consisting of iron bars of any desired cross section, arranged correspondingly close to each other, being inserted between the two cores. The girder may be of single or double T-cross section, but at certain intervals it is supplemented or thickened so as to form blocks flush with the flanges. The vertical faces of these block-shaped girder portions are provided with offsets, in such a manner that when the girders are placed side by side the left hand offset of one girder comes to lie on the right hand side offset of the adjoining one. These thickened portions, or blocks of the girders, are also provided with holes, in which, after the girders have been put in place, are introduced rods or bars so that, when girders, according to this invention, are used, a structure is obtained which acts as if it were made of a single plate.

THE LOCAL GOVERNMENT ANNUAL FOR 1904.—This excellent little work (edited by Mr. S. Edgecumbe Rogers, and published at 1s. 6d., at 27a, Farringdon-street, E.C.) is the thirteenth annual publication. The directory portion gives the names and addresses of the chief officials of all Corporations, London Borough Councils, County Councils, Boards of Guardians, Urban and Rural District Councils, County and Borough Asylums, &c., throughout the kingdom, as well as the public libraries, public parks, and City companies of London. A feature which will be found useful is the insertion of the names of the Chairmen of Committees in the Metropolitan Boroughs, also the Chairmen of the London County Council Committees. The names and addresses of the members of the Metropolitan Water Board, and a full list of the various Education Committees in England and Wales have been included. In addition to the directory, there is much useful information relating to the public libraries, baths, and washhouses, and electric light undertakings in the boroughs of London. The charges for water and gas in London are shown, the population of the various provincial unions is given, and there is also a list of all the parks and open spaces of the Metropolis, with the local authorities controlling them.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 14.—By ELSWORTH & KNIGHTON.

Chiswick.—13, 15, 17, 19, 29, 31, and 33, Annandale-rd., u.t. 75 yrs., g.r. 44*l.* 2s., w.r. 291*l.* 4s.	£2,100

By NEWBON, EDWARDS, & SHEPHARD.

Highbury.—115, Green Lanes, u.t. 45½ yrs., g.r. 16*l.*, y.r. 100*l.*	730
Holloway.—57 and 59, Landseer-rd., u.t. 59 yrs., g.r. 8*l.* 8s., y.r. 60*l.*	545
Finsbury Park.—7, Woodberry-gr., u.t. 59 yrs., g.r. 9*l.* 9s., e.r. 60*l.*	495

By T. D. PEACEY.

Clerkenwell.—38 and 39, Wharton-st., u.t. 25 yrs., g.r. 8*l.*, y.r. 96*l.*	575
Hampstead.—5, Provost-rd., u.t. 44½ yrs., g.r. 5*l.*, e.r. 60*l.*	545

By VARLEY & LOCKING.

Dalston.—90, Forest-rd., u.t. 47 yrs., g.r. 6*l.* 10s. e.r. 45*l.*	390
Hackney.—373, Hackney-rd., and 1, Garner-st., u.t. 12½ yrs., g.r. 5*l.* 6s., w.r. 73*l.* 4s.	200

January 19.—By PERCY H. CLARKE.

Fulham.—9, Musgrave-cres., u.t. 63 yrs., g.r. 2*l.* 5s. 6d., y.r. 32*l.*	400
Peckham.—22, Choumert-rd. (s.), u.t. 38½ yrs., g.r. 5*l.*, y.r. 45*l.*	565

By S. H. DAVIDS & CO.

Enfield Highway.—Market-pl., f.g. rents 13*l.*, reversion in 84 yrs.	315
Hampton Hill, Middlesex. — Uxbridge-rd., "Waybourne." f., y.r. 45*l.*	600

By DEBENHAM, TEWSON, & CO.

East Ham —Ernald-av., f.g. rents 70*l.*, reversion in 94 yrs.	1,560

By RUTLEY, SON, & VINE.

Euston-road.—29, George-st., f., w.r. 114*l.* 8s.	1,230
37, Stanhope-st., u.t., 53 yrs., g.r. 38*l.* y.r. 54*l.*	250
Regent's Park.—2, Longford-st. (factory), area 1,800 ft., u.t. 53 yrs., g.r. 20*l.*, y.r. 100*l.*	1,800
Hampstead-road.—15, Ampthill-sq., u.t. 39 yrs., g.r. 12*l.* y.r. 80*l.*	615
Camden Town.—221 and 223, Camden-rd., u.t. 32 yrs., g.r. 10*l.*, y.r. 120*l.*	830
272, Camden-rd., u.t. 39 yrs., g.r. 6*l.*, y.r. 97*l.* 10s.	750

By TOMKINS & CAPPER (at Abergavenny).

Raglan, Mon.—"The Pant Farm," 78 a. 2 r. 23 p., f., y.r. 70*l.*	1,620
Penrhos, Mon.—"Upper Clawdd Farm," 32 a., f., y.r. 40*l.*	875
Llanbedr, Brecon.—"Draen" and "Tyr Bach Farms," 56 a. 1 r. 10 p., f., y.r. 33*l.*	730
Abergavenny, Mon.—26, Lion-st., f., y.r. 32*l.*	530

January 20.—By FOSTER & CRANFIELD.

City of London.—42, Finsbury-sq. (Offices), area 4,050ft., u.t. 14 yrs., g.r. 283*l.* 3s., y.r. 770*l.*	2,000

By FURBERS'.

Holloway.—Holloway-rd., f.g r. 44*l.*, reversion in 59 yrs.	1,310
Witley-rd., f.g.r. 10*l.*, reversion in 59 yrs.	265

By E. & S. SMITH.

Clerkenwell.—15, Percy-circus, u.t. 29 yrs., g.r. 7*l.*, y.r. 110*l.*	760
Holloway.—29, Hilldrop-cres., u.t. 45 yrs., g.r. 8*l.*, y.r. 55*l.*	500

By DOUGLAS YOUNG & CO.

Notting Hill.—70, Cambridge-gdns., u.t. 60 yrs., g.r. 8*l.*, e.r. 80*l.*	780
South Lambeth.—36 and 37, Kenchester-st., w.r. 72*l.* 16s.; also i.g.r. 9*l.*, u.t. 51 yrs., g.r. 12*l.*	590

By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).

Brighton.—St. Catherine's-ter., "The Sussex Hotel," f., p.	15,000
West-st., "The Carpenter's Arms" p.h. (Christie's), f., p.	8,000

January 21.—By H. J. BLISS & SONS.

Bromley-by-Bow.—90 and 92, Fern-st., f., w.r. 62*l.* 8s.	525
Bow.—72, St. Stephen's-rd., u.t. 22½ yrs., g.r. 5*l.*, w.r. 32*l.* 10s.	105
157, 159, and 163, Tredegar-rd. (s.), y.r. 110*l.*; also i.g.r. 5*l.* 5s., u.t. 59 yrs., g.r. 16*l.* 16s.	1,025
Bromley-by-Bow.—19 and 20, Franklin-st., u.t. 48½ yrs., g.r. 8*l.*, w.r. 57*l.* 4s.	300

By FISHER, STANHOPE, & DRAKE.

Stoke Newington.—38, Cazenove-rd., u.t. 73 yrs., g.r. 9*l.* 9s., e.r. 60*l.*	530
Stamford Hill.—15, Dunsmure-rd., u.t. 80 yrs., g.r. 10*l.*, e.r. 60*l.*	620

By C. C. & T. MOORE.

Bow.—17, St. Stephen's-rd., u.t. 50 yrs., g.r. 4*l.*, y.r. 28*l.*	320

By NEWBON, EDWARDS, & SHEPHARD.

Stoke Newington. — 236, High-st. (s.), u.t. 70 yrs., g.r. 13*l.*, y.r. 150*l.*	1,900
Whitechapel.—11, Brady-st., part f. and part u.t. 53½ yrs., g.r. 25*l.*, y.r. 110*l.*	1,500
Stratford.—Angel-la., f.g.r. 150*l.*, reversion in 61 yrs.	4,150
Commercial-road East.—St. George's-ter., f.g. rents 75*l.*, reversion in 57 yrs.	1,800
Highbury.—12, 14, 16, and 18, Aubert-pk., u.t. 77 yrs., g.r. 33*l.* 4s., y.r. 184*l.*	2,015
Canonbury.—1, Canonbury-pk. (s.), u.t. 32½ yrs., g.r. 10*l.*, e.r. 80*l.*	445
Holloway.—61, St. John's-rd., u.t. 71½ yrs., g.r. 6*l.* 10s., y.r. 37*l.*	400

By STIMSON & SONS.

Clapham.—125, Dorset-rd., f., p.	315
127, 129, 133, to 145 (odd), Dorset-rd. (s), f., y.r. 253*l.*	3,055
1, Hannah-pl., f., w.r. 15*l.* 12s.	125
2 and 3, Palfry-pl., f., w.r. 44*l.* 4s.	430
183 and 185, Wirtemburg-st., f., w.r. 85*l.* 8s.	1,190
1 to 19 (odd), Chip-st., f., w.r. 249*l.* 4s.	3,305
Mile-end.—Burdett-rd., f.g. rents 77*l.* 5s., reversions varying from 43 to 46 yrs.	2,585
Highbury. — 65, Highbury New-pk., u.t. 45½ yrs., g.r. 15*l.*, e.r. 120*l.*	810
Battersea.—36, 38, and 40, Knowsley-rd., u.t. 65½ yrs., g.r. 10*l.* 10s., w.r. 71*l.* 10s.	500
Deptford.—3 and 4, Wotton-rd., u.t. 39½ yrs., g.r. 4*l.* 6s., w.r. 88*l.* 8s.	480

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RECENT SALES.—(*continued*).

Greenwich.—36, 38, and 40, Church-st. (s.), f., y.r. 88*l.* 4s. 500
Caledonian-road.—8 and 10, Gifford-st., u.t. 40½ yrs., g.r. 12*l.*, e.r. 72*l.* 510
By G. TROLLOPE & SONS.
New Bond-street.—No. 93 (s.), Corporation Lease, g.r. 5*l.* 12s. 6d., renewal fine 39*l.* 7s. 6d., p. 9,400
January 22.—FIELD & SONS.
Marylebone.—Shroton-st., "The Perseverance" p.h., a profit rental of 23*l.* for 47½ yrs.... 400
Plaistow.—58 to 68 (even), Valetta-gr., u.t. 82 yrs., g.r. 18*l.*, w.r. 126*l.* 2s. 855
By JONES, LANG, & CO.
Hammersmith.—Hammersmith-rd., l.g. rents 90*l.*, u.t. 65½ yrs., g.r. 3*l.* 1,790
Auriol-rd., l.g. rents 60*l.*, u.t. 65½ yrs., g.r. 4*l.* 1,150

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, JANUARY 29.

Royal Institution.—Mr. D. G. Hogarth, M.A., on "The Marshes of the Nile Delta." 9 p.m.
Institution of Civil Engineers (*Students' Meeting*).—Mr. A. P. Head on "Metallurgy as Applied in Engineering." 8 p.m.
Institution of Mechanical Engineers (*Extra Meeting*).—Discussion upon the following paper to be continued: "Sixth Report to the Alloys Research Committee on the Heat Treatment of Steel," by the late Sir Wm. C. Roberts-Austen, K.C.B., F.R.S., completed by Professor William Gowland. 8 p.m.
Glasgow Architectural Craftsmen's Society.—Mr. W. G. Peddie on "Comparison of Building Practices in Scotland." 8 p.m.

MONDAY, FEBRUARY 1.

Royal Institute of British Architects.—(1) To announce the name of the person the Council propose to submit as a fit recipient of the Royal Gold Medal 1904. (2) The President, Mr. Aston Webb, R.A., to deliver an address to students. (3) Mr. James S. Gibson to read a criticism of the works submitted for the prizes and Studentships 1903-1904. (4) Presentation of prizes by the President. 8 p.m.
Regent-street Polytechnic (*University Extension Lectures*).—Professor Vivian B. Lewes on "The Chemistry of Air, Fire, and Water." I. 8 p.m.
London Institution.—Mr. J. D. McClure on "The Measurement of the Heavens." Illustrated. 5 p.m.
South-Western Polytechnic, Manresa-road, Chelsea.—Mr. H. T. Scoble will open a debate on "Industrial Decentralisation." 8 p.m.
Institute of Sanitary Engineers, Ltd.—Examination and Literary Committee. 4 p.m.
Liverpool Architectural Society (*Incorporated*).—Mr. Henry Tanner, jun., on "Interior Woodwork in England." 6 p.m.
Bristol Society of Architects.—Paper by Professor Beresford Pite. 8 p.m.

TUESDAY, FEBRUARY 2.

Institution of Civil Engineers.—(1) Paper to be further discussed: "The Sanding-up of Tidal Harbours," by Mr. A. E. Carey. (2) Time permitting, paper to be read: "Tonnage Laws, and the Assessment of Harbour Dues and Charges," by Mr. H. H. West, 8 p.m.
Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. E. J. Steegmann on "Elementary Physics." I. 7 p.m.
Institute of Sanitary Engineers, Ltd. (*Lectures in Practical Sanitary Science*).—Mr. B. R. Tucker on "Heating and Hot Water Supply to Buildings." 7 p.m.

WEDNESDAY, FEBRUARY 3.

Royal Archæological Institute of Great Britain and Ireland.—The Rev. J. C. Cox, F.S.A., on "The College of Fotheringhay, from Original Documents." 4 p.m.
Institution of Civil Engineers.—Students' visit to the Plumstead Electricity and Destructor Station. Train from Charing Cross Station to Plumstead, 1.32 p.m.
Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. E. J. Steegmann on "Elementary Physics." II. 7 p.m.
Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.
Institute of Sanitary Engineers, Ltd.—(1) General Purposes and Finance Committee. 4 p.m. (2) Mr. S. L. Bartholomew on "Underground Conveniences." 7 p.m.
Society of Arts.—Mr. Thomas Clarkson, M.I.Mech.E., on "Steam Cars for Public Service." 8 p.m.

THURSDAY, FEBRUARY 4.

Society for the Encouragement of the Fine Arts.—Mr. H. Beaumont on "Chartres and its Cathedral," with lantern illustrations. 8 p.m.

FRIDAY, FEBRUARY 5.

Architectural Association.—Mr. W. A. Harvey on "Cottage Homes." 7.30 p.m.
Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. E. J. Steegmann on "Elementary Chemistry." I. 7 p.m.

SATURDAY, FEBRUARY 6.

Sanitary Inspectors' Association.—Twenty-first Annual Dinner, Venetian Chamber, Holborn Restaurant. 6.30 p.m.
Sanitary Institute (*Demonstrations for Sanitary Officers*).—Inspection at Charing Cross Hospital New Buildings. 2.15 p.m.
Incorporated British Institute of Certified Carpenters.—Monthly meeting, Carpenters' Hall. Mr. W. Middleton will open a discussion upon "Failures in Carpentry and Joinery." 6 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" at railway depôt
Red wire Cuts	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 8 0	" "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamfered, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamfered, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	"
Best Portland Cement	29 0	per ton, "
Best Ground Blue Lias Lime	20 6	"

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fire Clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms depôt	1 8½	" "
PORTLAND STONE (20 ft. average)— Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality.*

	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK— Scappled random blocks	3 0	per ft. cube "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
" 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
" 3 in. do.	1 2½	" " "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 best seconds "	12 15 0	" "
20 × 12 " " "	13 10 0	" "
16 × 8 best " "	7 0 0	"
20 × 10 best blue Portmadoc	12 12 6	" "

SLATES—(*continued*)—

in. in.	£ s. d	
16 × 8 best blue Portmadoc	6 12 6	" "
20 × 10 best Eureka unfading green	15 2 6	" "
20 × 12 best Eureka unfading green	17 2 6	" "
18 × 10 " "	12 10 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 10 0	" "
18 × 10 " "	9 10 0	" "
16 × 8 " "	6 10 0	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depot.
Hip and Valley tiles	3 7	per doz. " "
Best Broseley tiles	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " "
Hip and Valley tiles	4 0	per doz. " "
Best Ruabon red, brown or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 " "
Do. Ornamental do.	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000 " "
Do. pressed	47 6	" " "
Do. ornamental, do.	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15 10 0	16 10 0
Deals: best 3 by 9	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0 10 0	more than battens.
½ in.	1 0 0	

	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (80 ft. average)	3 5 0	3 15 0

JOINERS' WOOD.

	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in.	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
" 3 in by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	18 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" 3 in. by 9 in.	12 10 0	13 10 0
" battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	33 0 0	upwards.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6
Small "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
½ in. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube	0 4 0	—

	Per square.	
Prepared Flooring— 1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1½ in. by 7 in. yellow, planed and matched	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot	0 11 6	0 1 6
1 in. by 7 in. white, planed and matched	0 12 0	0 14 0

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WOOD—(*continued*)—

	Per square. £ s. d.	£ s. d.
Prepared Flooring.—(*continued.*)		
1¼ in. by 7 in. white, planed and matched	0 14 6	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6
6 in. at 6d. to 9d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ..	7 5 0
Compound Girders, ordinary sections	8 2 6 ..	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ..	8 17 6
Fitch Plates	8 5 0 ..	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ..	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 10 0 ..	8 0 0
Staffordshire Crown Bars, good merchant quality	8 0 0 ..	8 10 0
Staffordshire "Marked Bars"	10 10 0 ..	—
Mild Steel Bars	8 15 0 ..	9 5 0
Hoop Iron, basis price	9 5 0 ..	9 10 0
,, ,, galvanised	17 10 0 ..	—
(*And upwards, according to size and gauge.)		
Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ..	—
,, ,, 24 g.	10 15 0 ..	—
,, ,, 26 g.	12 5 0 ..	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ..	—
Ordinary sizes to 22 g. and 24 g	13 5 0 ..	—
,, ,, 26 g.	14 5 0 ..	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ..	—
,, ,, 22 g. and 24 g.	16 10 0 ..	—
,, ,, 26 g.	18 0 0 ..	—
Galvanised Corrugated Sheets—		
Ordinary sizes, 6 ft. to 8 ft. 20 g	12 15 0 ..	—
,, ,, 22 g. and 24 g.	13 5 0 ..	—
,, ,, 26 g.	14 0 0 ..	—
Best Soft Steel Sheets, 6ft. by 2ft. to 3 ft. by 20 g. and thicker	11 15 0 ..	—
Best Soft Steel Sheets, 22 g. & 24 g	12 15 0 ..	—
,, ,, 26 g	14 0 0 ..	—
Cut nails, 3 in. to 6 in. (Under 3 in., usual trade extras.)	9 5 0 ..	9 15 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 5 0 ..	—
Pipe in coils	14 15 0 ..	—
Soil pipe	17 5 0 ..	—
Compo pipe	17 5 0 ..	—
ZINC—Sheet—		
Vieille Montagne ton	26 5 0 ..	—
Silesian	26 0 0 ..	—
COPPER—		
Strong Sheet per lb.	0 0 10½ ..	—
Thin ,,	0 0 11½ ..	—
Copper nails ,,	0 0 11 ..	—
BRASS—		
Strong Sheet per lb.	0 0 10 ..	—
Thin ,, ,,	0 0 11 ..	—
TIN—English Ingots ,,	0 1 5 ..	—
SOLDER—Plumbers' ,,	0 0 6½ ..	—
Tinmen's ,,	0 0 8 ..	—
Plowpipe ,,	0 0 9 ..	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft.	delivered.
,, fourths	1½d. ,,	,,
21 oz. thirds	3d. ,,	,,
,, fourths	2½d. ,,	,,
26 oz. thirds	3½d. ,,	,,
,, fourths	3d. ,,	,,
32 oz. thirds	4½d. ,,	,,
,, fourths	4d. ,,	,,
Fluted sheet, 15 oz.	2½d. ,,	,,
,, 21 oz.	3½d. ,,	,,
¼ Hartley's Rolled Plate	1½d. ,,	,,
⅛ ,, ,, ,,	2d. ,,	,,
½ ,, ,, ,,	2½d. ,,	,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes or barrels per gallon	0 1 7
,, ,, ,, in drums ,,	0 1 10
Boiled ,, ,, in pipes or barrels ,,	0 1 10
,, ,, ,, in drums ,,	0 2 1
Turpentine, in barrels ,,	0 3 10
,, in drums ,,	0 4 0
Genuine Ground English White Lead per ton	19 0 0
Red Lead, Dry ,,	19 0 0
Best Linseed Oil Putty per cwt.	0 7 6
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERDEEN.—For new church and halls, Queen-street and West North-street, for North U. F. Church congregation. Mr. W. E. Gauld, architect, 258, Union-street, Aberdeen. Quantities by architect:—

Mason: Edgar Gauld, 28, Gilcomston-terrace
Carpenter: Hendry & Keith, 21, Gilcomston-park
Slater: George Farquhar, Union-row
Plasterer: J. Bannochie & Son, Belmont-st.
Plumber: A. B. Robertson & Son, Union-st.
Steel and Iron: W. McKinnon & Co., Spring-gardens
Electric Lighting: Claud Hamilton, Ltd., Union-street
Painter: A. Ferguson & Co., Alford-place
All of Aberdeen.

Total about £8,500

ALNWICK.—For 450 yards of 9 in. main sewerage for Fisher's-lane district, for the Urban District Council. Mr. Geoffrey Wilson, Town Surveyor. Quantities by Surveyor (estimate, £120):—

	£ s. d.
G. Brough	£139 10 0
Green Bros.	118 10 0
J. Whinham	112 11 0
McLaren & Co., Embleton, Woodstead, Christon Bank, R.S.O., Northumberland*	73 10 0

CARDIFF.—For the erection of mortuary buildings in Crawshay-lane, Penarth-road, for the Corporation. Mr. W. Harpur, Borough Engineer, Cardiff. Quantities by Borough Engineer:—

	£ s. d.
J. Allan & Son	£1,583 2 3
Lattey & Co.	1,574 13 10
D. Davies	1,458 0 0
A. W. Cadwallader	1,450 17 5
Gough Bros.	1,429 0 0
Geo. Griffiths	1,428 0 0
D. W. Davies	1,382 0 0
F. Bond	1,370 5 8
G. Paltridge	1,369 7 8
F. Small	1,317 0 0
Blacker Bros	1,299 16 0
Knox & Wells	1,297 10 0
C. Beames & Nephew	1,284 15 5
W. Symonds & Co.	1,259 0 0
J. E. Williams	1,251 6 3
Tucker Bros.	1,242 0 0
E. Turner & Sons	1,229 10 6
W. T. Morgan, Cardiff‡	1,200 0 0

‡Recommended for acceptance by Council.

CARSHALTON.—For heating and hot-water supply apparatus, steam and condense mains, water and fire services at Southern Hospital, Carshalton-on-the-Hill, Surrey, for Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer and Surveyor to the Board:—

	£ s. d.
Werner, Pfleiderer, & Perkins, Ltd.	£24,000 0 0
T. S. Knight & Sons	22,500 0 0
Simpson, James, & Co., Ltd.	20,050 0 0
Dargue, Griffiths, & Co., Ltd.	19,988 0 0
Moorwood, Sons, & Co., Ltd.	17,500 0 0
John Metcalf	17,460 5 0
R. Harding & Son	17,370 0 0
Z. D. Berry & Sons	16,956 0 0
G. Fawley & Son, Ltd.	16,361 6 6
P. H. Allin & Sons	16,134 0 0
Rosser and Russell, Ltd.	15,900 0 0
J. & F. May	15,700 0 0
Wenham & Waters, Ltd.	15,480 0 0
Lea & Warren	14,905 0 0
Wm. Freer	13,750 0 0
Brightside Foundry and Engineering Co., Ltd.	12,756 0 0
Joseph Richmond & Co., Ltd., 30, Kirby-street, Hatton-garden, E.C.*	12,340 0 0

[Engineer's estimate, £16,000.]

COGGESHALL (Essex).—For new road, for the Rural District Council. Mr. E. H. Bright, Surveyor, Dodds Hall, Braintree:—

For Carting Materials:—Fred Matravers, Church-street, Coggeshall.* Brick rubbish and gravel, 1s. 4d. per yard, and granite 1s. 4d. per ton.
For Team Labour:—Arthur Hutley, Church-street, Coggeshall.* Hire of two-wheeled carts with one horse and man, 7s. 6d. per day; hire of two-wheeled carts with two horses and man, 13s. per day; horse and chain-harness and man, 7s. 6d. per day.
Brick Rubble:—Last & Butcher, Heybridge,* 5s. 2d. per yard.
Gravel Flints:—W. H. Collier, Marks Tey,* 5s. per yard; Last & Butcher, Heybridge,* 7s. 1d. per yard (half each, 400 yards, about).
Granite:—Jas. Runnals & Son, Penzance, Cornwall,* 12s. per ton (subject to the approval of the Chief County Surveyor).

DRIFFIELD.—For additions to workhouse infirmary, for the Guardians. Mr. Joseph Shepherdson, architect, Driffield. Quantities by Mr. John Watson, Hull:—

	£ s. d.
John Sawden	£2,865 12 0
Arthur Leason	2,850 0 0
T. S. Ullathorne	2,797 9 6
J. R. Stork	2,744 18 11
A. A. Booth	2,704 17 0
Sawden Bros.	2,700 0 0
Smallwood & Shaw	2,677 5 10
W. Leason & Son	2,675 0 0
F. Thornton	2,668 13 6
Sawden & Son	2,610 0 0
M. Gage	2,581 0 0
C. W. Dry	2,575 0 0
H. Naylor, Driffield*	2,570 0 0

GOLCAR (Yorks).—For the erection of three dwelling-houses in Station-road. Mr. A. Shaw, architect, Golcar:—

	£ s. d.
Masons: Walker Bros., Contractors, Golcar	£327 0 0
Plasterers and Painters: Dan Shaw, Golcar Hill, Golcar	54 0 0
Plumbers: France, Bamforsh, & Shaw, Plumbers, Slaithwaite	44 0 0
Slaters: T. B. Tunnacliffe, West Parade, Huddersfield	40 10 0

GRIMSBY.—For the construction of gangway and additional bookcases at the Public Free Library, for the County Borough of Grimsby. Mr. H. Gilbert Whyatt, A.M.I.C.E., Borough Engineer and Surveyor:—

	£ s. d.		£ s. d.
Waterman	£175 6 0	Thomas	£117 19 6½
White	139 12 8	Rands and Smith	138 18 3
Lindup	100 15 0	North of England Furnishing Company	133 0 0
Dixon, Grimsby*	97 15 0		

HOLLINSEND.—For sewering work, for the Handsworth Urban District Council. Mr. Bernard Powell, surveyor and engineer, Handsworth:—

	The Croft. £ s. d.	Albert-road. £ s. d.	Total. £ s. d.
Thomas Whitehead	£213 8 0	£215 5 0	£428 13 0
Dawson & Jonas	173 15 0	192 15 0	366 10 0
Geo. Hall & Co.	104 4 9	125 7 4	229 12 1
Pinder Bros.	92 15 0	106 6 0	199 1 0
Green & Co.	79 5 9	98 3 6	177 9 3
G. W. Young	111 7 0	97 7 9	208 14 9
James Holmes	78 16 6	95 8 0	174 4 6
Kirkley & Drabble, Mostro*	—	—	172 0 0
Engineer's estimate	82 0 0	99 10 0	181 10 0

HORSELL.—For alterations to residence, "Brock Hill," Horsell, Surrey, for Mr. H. P. Lawson. Mr. H. G. Gribble, architect, St. John's, Surrey:—

	£ s. d.		£ s. d.
C. Colborne	£655	W. R. Roake	£505
Drowley & Co.*	518	H. W. Hutton	453

ISLEWORTH.—For Guernsey granite spall at Workhouse, for the Brentford Union Guardians:—

J. Mowlem & Co., Grosvenor Wharf, Westminster, S.W., 200 tons of hard Guernsey granite spalls at 11s. 4d. per ton.

LANCHESTER (co. Durham).—For new R.C. presbytery. Mr. H. T. Gradon, architect, Durham:—

	£ s. d.		£ s. d.
Gradon & Son	£1,550 0 0	Rutter & Sons	£1,355 0 0
Draper & Sons	1,507 12 2	Jas. Robson, Thos. Hilton	1,369 7 7
Waterhouses	1,339 0 0		

LANCHESTER (co. Durham).—For new R.C. schools. Mr. H. T. Gradon, architect, Durham:—

	£ s. d.		£ s. d.
Draper & Sons	£1,926 2 7	Rutter & Sons	£1,608 0 0
Gradon & Son	1,800 0 0	Jas. Robson, Thos. Hilton	1,658 17 7
Waterhouses	1,510 0 0		

LEYTON.—For constructing the Fillebrook Valley sewer in Sidmouth-road and between Southwest-road and Wallwood-road, for the Urban District Council. Mr. W. Dawson, M.Inst.C.E., Town Hall, Leyton:—

	Scheme A. Brick Culvert. £ s. d.	Scheme B. Concrete Tube. £ s. d.
R. Ballard	£4,975 0 0	£4,297 0 0
Rowell & Sons	4,835 19 6	4,646 17 0
F. J. Coxhead	3,678 0 0	3,003 0 0
T. Adams	4,670 15 6	3,927 19 6
John Jackson	3,729 13 6	3,419 14 2
G. Bell	4,968 10 6	4,637 10 6
G. J. Anderson	3,404 14 1	3,029 5 11
W. Manders, Leyton*	3,331 12 8	2,957 2 8
Surveyor	3,560 0 0	3,080 0 0

LONDON.—For the supply of four 3,000 kilowatt three-phase generators at the Greenwich electricity generating station, for the London County Council:—

	£ s. d.
Richardson, Westgarth, & Co., Ltd.	£39,342 10 0
Dick, Kerr, & Co.	36,000 0 0
The British Westinghouse Electric and Manufacturing Company, Ltd.	34,385 0 0
The Brush Electrical Engineering Company, Ltd	32,872 0 0
Bruce, Peebles, & Co., Ltd.	30,558 0 0
The Electric Construction Company, Ltd., London and Wolverhampton*	29,600 0 0
Witting, Eborall, & Co., Ltd.	29,360 0 0
The General Electric Company (1900), Ltd.§	24,379 0 0
The International Electrical Engineering Company, Ltd.§	23,435 0 0
The Siemens Schuckert Works‖	23,405 12 0
Siemens Bros. & Co., Ltd.‖	23,385 0 0

§ Requires auxiliary heavy fly-wheel.
‖ Not to specification.

[The Electric Construction Company, Ltd., are allowed to sublet to Messrs. P. R. Jackson & Co., or to Mr. R. G. Ross, or to such other firm as may be approved by the engineer under the contract, the manufacture of the gear for the barring motors required for use in connexion with the generators referred to.]

LONDON.—For road-making works at Park Hospital, Hither Green, Lewisham, S.E., for Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer and Surveyor to the Board:—

	£ s. d.		£ s. d.
B. Martin	£1,560 14 0	J. C. Trueman	£636 0 0
Wm. Pearce	890 0 0	Thos. Adams	627 0 0
R. E. Mayo	850 0 0	E. B. Yewen	599 0 0
J. Summerfield	800 13 11	A. T. Catley	594 0 0
F. Fowles	728 0 0	Fry Bros.	570 0 0
J. Mowlem & Co., Ltd.	695 0 0	H. Woodham & Sons, Sangley-road, Catford, S.E.*	499 0 0
R. Ballard, Ltd.	687 0 0		

[Engineer's estimate, £530 7s. 6d.]

LONDON.—For the erection of a mortuary, post-mortem room, etc., Lamb-lane, for the Greenwich Borough Council. Mr. Alfred Roberts, architect, 18, Nelson-street, Greenwich:—

	£ s. d.		£ s. d.
B. Sargent & Co.	£2,999 0 0	B. E. Nightingale	2,141 0 0
J. F. Holliday	2,558 0 0	T. G. Sharpington	2,128 0 0
F. T. Thorne	2,300 0 0	H. Groves	2,116 0 0
Enness Bros.	2,270 0 0	W. Martin	2,102 0 0
S. J. Jerrard & Sons	2,249 0 0	H. Kent	2,100 0 0
C. R. Price	2,244 0 0	F. J. Gorham	2,091 5 10
Lole & Lightfoot	2,241 0 0	Thomas & Edge	2,079 0 0
Holliday & Greenwood	2,237 0 0	J. Ferguson & Co.	2,070 0 0
J. O. Richardson	2,198 0 0	W. Mills, St. George's-rd. Blackheath†	2,068 0 0
C. Ansell	2,195 0 0		
Foster Bros.	2,166 0 0		
J. Parsons	2,146 0 0		
H. Somerford & Son	2,145 0 0		

(*Continued on page* 123).

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Isolation Hospital	Hitchin Joint Hospital Board	See Advt. in this issue	Feb. 1
Enlarging of Chancel, Holy Trin. Ch., St'kt'n-on-Tees	Particulars, Holy Trinity Vicarage	No premium	Mar. 1
*Designs for Branch Public Libraries	County Borough of St. Helens	20*l.* and 10*l.*	Mar. 31
*Designs for New School	Govs. of N'c'tle-on-Tyne R.G.S.	100*l.*, 50*l.*, 25*l.*	April 30
*Design for Reconstrution of Meat Market	Haverfordwest Town Council	20 Guineas	No Date

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Bridge, etc., Pelyn Lake, Lanlivery, nr. Lostwithiel	Cornwall County Council	S. W. Jenkin, M.Inst.C.E., County Surveyor, Liskeard	Jan. 30
Bridge at Clerkenwater, near Bodmin	do.	do.	do.
Relieving Arch, etc., at Yeolmbridge	do.	do.	do.
Bridge, etc., Lavedden, near Bodmin	do.	do.	do.
Alterations to Board Room, etc., Northumberland-sq.	Tynemouth Guardians	H. Gibson, Architect, Wellington Chambers, North Shields	do.
Tool Shed, Mansbridge, North Stoneham	South Stoneham R.D.C.	W. F. Watts, Building Surveyor, Bitterne	Feb. 1
Causewaying, etc., Anderson-street, etc.	Town Council, Port Glasgow	A. Paton, Town Clerk, Port Glasgow	do.
Spec'l Sch.,C'kery, etc., Paget-st. & Carter-rd., Newhall	Sheffield Education Committee	Holmes & Watson, Architects, 38, Church-street, Sheffield	do.
Heating Apparatus, Hammerton-street School	do.	W. J. Hale, 13, St. James's-row, Sheffield	do.
Furniture for Isolation Hospital, Hampton Hill	Hampton U.D.C.	Surveyor, Public Offices, Hampton	do.
Materials, Longford Depot	Warrington Corporation	Manager, Longford Depot	do.
Alterations, etc., 41, Upper Sackville-street, Dublin	National Institution for the Blind	Carroll & Batchelor, Architects, 86, Merrion-sq. South, Dublin	do.
Board School, Long Lee, Keighley	Keighley School Board	A. P. Harrison, Architect, 18, Cooke-lane, Keighley	do.
School, New Tredegar	Bedwellty School Board	James & Morgan, Architects, Charles-street Chambers, Cardiff	do.
Alterations and Additions, Upper Rhymney School	do.	do.	do.
38,000 sup. ft. Pa. Glazing, Electric Car Wks., Hyde-rd.	Tramways Com. Manchester Corp	J. M. M'Elroy, Tramways Department, 55, Piccadilly	do.
Seven Motor Cars, to run on Tramways	Kirkcaldy Corporation	O. F. Francis, Burgh Electrical Engineer, Victoria-road, Kirkcaldy	do.
Street Works (Herbert-street and Arthur-street)	Prestwich U.D.C.	Surveyor, Chester Bank, Prestwich	do.
Alterations, etc., to the Old Theatre, Buxton	Buxton Gardens, etc., Co., Ltd.	W. R. Bryden, Architect, 1, George-street, Buxton	do.
Three W.T. Boilers, etc., Bengw'th-rd., Loughboro Ju.	S. London Electric Supply Corp.	Kincaid, Waller, Manville, & Dawson, Engs., 29, Gt. George-st.,S.W.	do.
Alterations, etc., House & Farm bldgs., Nocton Heath	J. Hodgson	W. Watkins & Son, Architects, Silver-street, Lincoln	do.
Alterations to Farmhouse, Nocton	do.	do.	do.
Sewers and Sewage Works, Menstrie	Clackmannanshire County Council	W. R. Copland, C.E., 146, West Regent-street, Glasgow	do.
Alterations, etc., Workhouse Chapel	Bishop's Stortford Guardians	The Workhouse, Bishop's Stortford	do.
*Free Library, Victoria-avenue	Borough of Harrogate	H. T. Hare, F.R.I.B.A., 13, Hart-st., Bloomsbury-square, W.C.	do.
Materials, Night Soil Department	Warrington Corporation	Cleansing Superintendent, Central Sanitary Depot, Howley	Feb. 2
500 Galvanised Steel Sanitary Pails	do.	Cleansing Department, Central Sanitary Depot, Howley, Warrington	do.
500 Galvanised Steel Ash Bins	do	do.	do.
Street Works, Walter-street, Abercynon	Mountain Ash U.D.C.	W. G. Thomas, Surveyor, Town Hall, Mountain Ash	do.
Stoneware Pipes, etc.	Leyton U.D.C.	W. Dawson, Surveyor to Council, Town Hall, Leyton	do.
1,300 yards of Pipe Sewers, Dinnington Colliery	Seaton Burn Coal Company	H. W. Taylor, A.M.I.C.E., St. Nicholas Cham'rs, Newcastle-on-Tyne	do.
Electric Light and Painting, Liberal Club, Woodhouse	do.	T. A. Buttery & S. B. Birds, Architects, 1, Basinghall-sq., Leeds	do.
Business Premises, Clough Bridge	H. Taylor	Brodrick, Lowther, & Walker, Central Chambers, Bridlington	do.
Rebldg.Weigh Office, etc., Sunbridge-rd. Destr'tor Wks	Bradford Corporation	F. E. P. Edwards, City Arch., Whitaker Bldgs, Brewery-st. Bradford	Feb. 3
*Warehouse in Lant-street, Borough	do.	George A. Lansdowne, Arch., 9, Regent-st., Waterloo-place, S.W.	do.
Heating at Nurses' Home, Union Hospital	Ashton-under-Lyne Guardians	J. Eaton, Sons, & Cantrell, Arch., Stamford-st., Ashton-under-Lyne	do.
Boundary Wall, etc., Along George Mellor-road	do.	do.	do.
Spring Steel	East India Railway Company	C. W. Young, Secretary, Nicholas-Lane, London, E.C.	do.
Galvanised Steel Strand Wire for Fencing	do.	do.	do.
Tiling One Side of Swimming Bath, Lavington-street	Southwark Borough Council	Borough Engineer, Southwark Town Hall, Walworth-road, S.E.	do.
Materials	do.	Town Hall, Walworth-road, S.E.	do.
Extens'n. of Elec. Light Installation, Marshall-st Baths	Westminster City Council	J. Hunt, Town Clerk, City Hall, Charing Cross-road, W.C.	do.
*Supply of Road Materials	H.M. Office of Works	H.M. Office of Works, Storey's Gate, S.W.	do.
Materials	Hollingbourn R.D.C.	H. J. Bracher, Clerk, 33, Earl-street, Maidstone	do.
Paving Works	Greenwich Borough Council	Borough Engineer's Office, Town Hall, Greenwich	do.
Painting Exterior of Pier Pavilion	Southend-on-Sea Corporation	E. J. Elford, Borough Engineer, Southend	do.
Russian Bath, etc., Dalry Public Baths	Edinburgh Corporation	R. Morham, City Arch., Public W'ks Office, City Chambers, Edin.	do.
Steel and Iron Work, Skerrie's Lighthouse	do.	E. P. Edwards, Secretary, Trinity House, E.C.	Feb. 4
Hard-wood Blocks, High-street, etc.	Southend-on-Sea Corporation	E. J. Elford, Borough Engineer, Southend	do.
Scavenging	Blaydon U.D.C.	R. Biggins, Sanitary Inspector, Council Offices, Blaydon-on-Tees	do.
227 yds. 18 in. Stoneware Pipe Sewer, Garden-st., etc.	Ramsbottom R.D.C.	J. Diggle, C.E., Hind Hill-street, Heywood	do.
Rebuilding Boundary Wall, Fortune Green	Hampstead Borough Council	Borough Engineer, Town Hall, Haverstock Hill, N.W.	do.
Auction Mart, Blairgowrie	M'Kinnon & Doeg	W. J. Brewster Grant, Architect, Bengarth, Blairgowrie	do.
Eight Houses, Clayton-road, Lidget Green	do.	W. Rycroft, Architect, Bank Buildings, Manchester-rd., Bradford	do.
School, Camelsdale, near Haslemere	West Sussex Education Committee	J. H. Howard, Architect, Lower-street, Haslemere	do.
Six Houses, Allergate Estate, Durham	Durham Co-operative Society	G. Ord, Architect, 16, The Avenue, Durham	do.
Building and Drainage, Workhouse Infirmary, Ore.	Hastings Guardians	A. W. Jeffery & Son, 5, Havelock-road, Hastings	do.
Alterations and Additions to Workhouse	Barnstaple Guardians	W. C. Oliver, Architect, Barnstaple	do.
Concrete Landing Stage, Firestone Bay	East Stonehouse U.D.C.	F. A. Wiblin, Surveyor's Office, Town Hall, East Stonehouse	do.
Four Dwelling-houses, Burbeary-road, Lockwood	do.	J. B. Abbey & Son, New-street, Huddersfield	do.
Two c.i. Filters	Newburgh Town Council	W. D. Sang & Lockhart, C.E, Kirkcaldy	do.
2,500 yards c.i. Pipes	do.	do.	do.
Paving, etc., Ormskirk	West Lancashire R.D.C.	C. Law-Green, Surveyor, Wigan-road, Ormskirk	do.
Materials, Ormskirk	do.	do.	do.
*Excavation and Concrete Wk. at New Baptist Chapel	Southampton Corporation	William Stevens, 21, New Bridge-street, E.C.	do.
Sub-soil Drains, at Cemetery, Hollybrook	do.	Borough Engineer, Market Chambers, Southampton	Feb. 5
Residence, Nields-road, Slaithwaite, Yorks	Meath County Council	Lunn & Kaye, Architects, Milnsbridge	do.
Bridge over River Boyne at Trim	Barrow-on-Soar R.D.C.	H. J. Cullen, County Offices, Navan	Feb. 6
Pipe Sewers, Sileby	Rathdrum & Wicklow Jt. Burial Bd.	W. H. Simpson, Engineer, Corridor Chambers, Market-place, Leics.	do.
Retaining, etc., wall, etc., Merrymeeting Cemetery	do.	J. Pansing, A.M.Inst.C.E., Town Hall, Wicklow	do.
Two Mortuary Chapels and House	Guardians	do.	do.
Additions, etc., to Workhouse, Lanchester	Littlehampton U.D.C.	Newcombe & Newcombe, Arch., 89, Pilgrim-st., Newc'stle-on-Tyne	do.
Carts and Sweeping Machine	Horwich, etc., Hospital Com.	H. Howard, Surveyor, Town Offices, Littlehampton	do.
Elec. Light in Five Bldgs. of Hospital, Fall Birch-lane	Dublin Corporation	Cressey & Keighley, Architects, Euston-road, Morecambe	do.
Stores and Articles	do.	Spencer Hartz, Borough Surveyor, Dublin	do.
Sinking Two Shafts, Carnock Colliery	County of Southampton	The Alloa Coal Co., Ltd., Alloa, N.B.	do.
*Additional Drying Room, etc., at Co. Asylum Knowle	Hinckley U.D.C.	County Surveyor, The Castle, Winchester	do.
Materials	Penrith R.D.C.	E. H. Crump, Surveyor, Council Offices, Hinckley	Feb. 8
Two Bridges (Lambeck and Gill)	do.	J. W. Smith, Clerk to Council, Penrith	do.
500 yds. of Dry Wall at Lambeck	Brighton Corporation	do.	do.
20-Ton Four Motor Crane, Power Station, Southwick	Drainage Committee, Canterbury	A. Wright, Engineer, Star Chambers, 30, Moorgate-street, E.C.	do.
Four Motor-driven Pumps at Sewage Farm	Kingswinford R.D.C.	C. A. Blascheck, City Electrical Engineer, Canterbury	do.
1,175 Tons of c.i. Pipes	do.	W. Fiddian, F.S.I., Old Bank Offices, Stourbridge	do.
Manhole and Lamphole Covers	Manchester Corporation	do.	do.
House Drainage Work for Twelve Months	do.	H. Prescott, Manager of House Drainage Dept., Manchester	do.
Ventilating Grids and Castings for Twelve Months	Belfast Harbour Commissioners	do.	do.
Shed Extension, York Dock, co. Antrim	West Runton Parish Council	G. F. L. Giles, Harbour Engineer, Belfast	do.
Extending and Rebuilding Churchyard Wall	Royal Borough of Kensington	J. Kemp, East Runton	do.
Work, Materials, etc.	L.C.C.	Town Hall, Kensington	Feb. 9
Eight Railway Turntables, Gener. Station, Greenwich	Stoke Newington Borough Council	County Hall, Spring Gardens, S.W.	do.
Work, Materials, etc.	B'ham., Tame, and Rea D.D.B.	Surveyor, Town Hall, Milton-road, Stoke Newington	do.
Stores and Materials	Branston R.D.C.	J. D. Watson, Engineer to Board, Tyburn, near Birmingham	do.
Carting Road Materials	Lutterworth R.D.C.	J. W. Sewards, Surveyor, Auborn	do.
Granite	Southampton Corporation	J. B. Holroyd, District Surveyor, Lutterworth	do.
Additions to Offices, Corporation Wharf, Chapel	Hailsham Guardians	Borough Engineer, Market Chambers, Southampton	do.
Alterations, etc., Hellingly Workhouse, Sussex	Shoeburyness U.D.C.	Mitchell & Ford, Architects, 7, Gildredge-road, Eastbourne	do.
Making-up Linton-road		H. Harris, Surveyor, Clarence Chambers, Southend	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Residence and Business Premises, Saintfield, co. Down	Minnes Bros.	Hobart & Heron, Architects, Dromore, co. Down	Feb. 10
Natural and Artificial Flags, Granite, &c.	Birkenhead Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead	do.
Stores and Materials	do.	do.	do.
Stores	Sewering Committee, Bury	A. W. Bradley, A.M.I.C.E., Borough Engineer, Bury, Lancs.	do.
Alterat'n., etc., Christian-st. Stores, Harrington, Cumb.	Co-operative Society	C. W. Eaglesfield, Architect, Gordon-street, Workington	do.
*Acetylene Gas Fittings, Cobham Hosp., nr. Gravesend	Strood R.D.C.	E. Godfrey Page, 485, Warwick-court, Gray's Inn, W.C.	do.
*Cleaning and Watering Roads, etc., in Regent's Park	Crown Estate Paving Commission	The Lodge, Park-square West, Regent's Park	do.
*Additional Contracts	Battersea Borough Council	Town Hall, Lavender-hill, S.W.	do.
*Erecting Cottage at Shooter's Hill and Tooting-grove	M. A. B.	Office of the Board, Embankment, E.C.	do.
Extension of Generating Station, Port Dundas	Glasgow Corporation	W. A. Chamen, Engineer, 75, Waterloo-street, Glasgow	Feb. 11
4,000 Tons of Slag	Worksop U.D.C.	G. H. Featherston, Clerk, Town Hall, Worksop	do.
Church, Tennent-street, Belfast	Shankhill-rd. Baptist Church Com.	J. A. Hanna, Architect, 102, Donegall-street, Belfast	do.
*Supplies, etc.	West Ham Council	Borough Engineer, Town Hall, Stratford, E.	do.
Stores	Belfast & County Down Ry.	Secretary's Office, Queen's Quay Terminus, Belfast	Feb. 12
300 Yds. of Unclimbable Fencing, Potternewton Pk.	Leeds Corporation	City Engineer's Office, Leeds	do.
*Additional Houses, etc., at Netley Coastguard Station	Admiralty	Superintending Engineer, H.M. Dockyard, Portsmouth	do.
*New Coastguard Station, etc., St. Leonards	do.	Director of Works Dept., 21, Northumberland-avenue, W.C.	do.
Materials for the Water Committee		Water Engineer, Municipal Offices, Sankey-street, Warrington	Feb. 13
*Ext'n. of Sea Defence Wks., Blue Anchor, nr. Watchet	Somerset County Council	County Surveyor's Office, Belmont, Bath	Feb. 15
Underground Conveniences, Promenade, Whitley Bay	Whitley & Monkseaton U.D.C.	J. P. Spencer, Architect, 30, Howard-street, North Shields	do.
Cast Iron Tank, etc., Longford Depot	Sanitary Works Com., Warrington	Manager, Longford Depot, Warrington	do.
Small Reservoir, Longford Depot	do.	do.	do.
Stores for One Year, for Paving Committee	do.	Borough Surveyor, Town Hall, Warrington	do.
Stores	River Weaver Navigation Trustees	J. A. Saner, Engineer, Weaver Navigation, Northwich	do.
Sewerage, etc., Works, Selston, Notts	Basford U.D.C.	Sands & Walker, & S. Maylan, Engineers, Milton-st., Nottingham	do.
Two Hydraulic Goods Lifts, Cold Air Stores, Smithfield	Manchester Markets Committee	City Surveyor's Office, Town Hall, Manchester	do.
*Furniture at Shipman-road Schools	Borough of West Ham	William Jacques, A.R.I.B.A., 2, Fen-court, Fenchurch-street, E.C.	do.
*Roadmaking and Sewers, at White Hart Lane	London County Council	Hous. of Working Class Sec., Arch. Dept., 19, Charing-cr.-rd., W.C.	Feb. 16
Sewers and Sewage Purification Works	Wellington (Somerset) U.D.C.	C. J. Lomax, A.M.Inst.C.E., 37, Cross-st., Manchester	do.
200,000 Railway Sleepers	G.N. Railway	Engineer to the Company, King's Cross Station, London	do.
Fire Hydrants, etc., Waterworks	Plymouth Corporation	F. Howarth, Water Engineer, Municipal Offices, Plymouth	do.
Fire Station and Police Station, London-road, etc.	Watch Com., Manchester Corp.	City Treasurer, Town Hall, Manchester	Feb. 17
Wooden Shelter, Hunslet Lake Side, Leeds	Leeds Corporation	City Engineer's Office, Leeds	do.
Annual Contracts	Folkestone Corporation	A. E. Nichols, Borough Engineer, Corpn. Offices, Folkestone	do.
*Superstructure of proposed Fire Station, etc.	Manchester Corporation	William Windsor, Quantity Surveyor, 37, Brown-st., Manchester	do.
Natural Mineral Rock Asphalt Work, Dock 9, Salford	Manch'ter Dk. & Warch'e Ex. Co.	W. H. Hunter, Ship Canal Co., 41, Spring Gardens, Manchester	Feb. 15
Sinking a Well, Gransha	Derry Dis. Lun. Asy. Committee	M. A. Robinson, C.E., Richmond-street, Londonderry	Feb. 19
Materials for One Year	Plymouth Corporation	J. Paton, Borough Engineer, Municipal Offices, Plymouth	Feb. 20
Two c.i. Pressure Filters, Newburgh Water Supply	Newburgh Town Council	W. D. Sang & Lockhart, C.E., Kirkcaldy	do.
2,500 lin. yds. c.i. Pipes, etc., Newburgh Water Sup.	do.	do.	do.
Comp. Vertical Inverted Eng. and Borehole Pump	Chelmsford Corporation	P. Griffith, Engineer, 54, Parliament-street, Westminster, S.W.	do.
*Infectious Diseases Hospital	Reading Borough Council	C. Smith & Son, Architects, 164, Friar-street, Reading	do.
*Annual Contracts	Borough of Hornsey	Boro' Engineer, Municipal Offices, Southwood-lane, Highgate, N.	Feb. 22
Engine and Dynamo	Edinburgh Corporation	Resident Electrical Engineer, Dewar-place Station, Edinburgh	do.
Fifty-eight Houses, Ely-street, Tonypandy	Tonypandy Building Club	Lewis & Morgan, Architects, 55, Dunraven-street, Tonypandy	do.
Victoria Station, Manchester, Extension (Contract 4)	Lancashire & Yorkshire Rail'y. Co.	Engineer's Office, Hunt's Bank, Manchester	Feb. 23
*Erection of Tramway Car Sheds, etc.	Walthamstow U.D.C.	Council's Engineer, Town Hall, Walthamstow	do.
Conduits and Mains	Islington Borough Council	Borough Engineer, 50, Eden-grove, Holloway, N.	Feb. 24
*Two Additional Wards at Rainhill Annexe	Lancashire Asylums Board	Clerk and Steward, County Asylum, Rainhill	Feb. 25
Erec. of Cen. Boiler House, etc., Hanwell Lun. Asy.	L.C.C. Asylum Committee	Clerk of the Asylums Com., Asy. Com. Office, 6, Waterloo-pl., S.W.	Feb 27
*Additional Buildings at South-grove Workhouse	Whitechapel Guardians	Guardians Offices, Vallance-road, Whitechapel	Feb. 29
Twenty-five Electric Hoists for Transit Sheds, Dock 9	Directors Manchester Ship Canal	W. H. Hunter, M.Inst.C.E., 41, Spring-gardens, Manchester	Mar. 1
Ten Electric Fixed Cranes for Transit Sheds, Dock 9	do.	do.	do.
12,000 Tons 2 in. Blue Guernsey Granite, etc.	Middlesex County Council	County Engineer and Surveyor, Middlesex Guildhall	do.
Cartage of Materials	do.	do.	do.
*Municipal Offices and other Buildings	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	do.
Light Railways	Middlesex County Council	County Engineer, Middlesex Guildhall, Westminster	Mar. 14
Sea Embankment and Wet Dock	Swansea Harbour Trustees	A. O. Schenk, M.Inst.C.E., Harbour Offices, Swansea	No date
Reading & Smoking Room, Vulcan Ironworks, Derby	Ley's Malleable Castings Co.	E. R. Ridgway, Architect, Long Eaton	do.
Water Tower, Vulcan Ironworks, Derby	do.	do.	do.
Cutting Eleven Bog Keshes	Magherafelt R.D.C.	W. Hastings, Clerk, R.D.C. Office, Magherafelt, Ireland	do.
Church of St. John, Portobello, Edinburgh		J. T. Walford, Architect, Joppa	do.
Wooden Rails Round Track, Blackhall Racecourse	Carlisle Race Staud Company	J. P. Stubbs, Secretary, 15, Howard-place, Carlisle	do.
100 Tons of Fine Crushed Slag	Tynemouth Corp.	J. F. Smillie, Borough Surveyor, Tynemouth	do.
Six Houses, Whitewell Bottom, Lancs.		R. Whittaker & Son, School-street, Whitewell Bottom	do.
Weaving Shed, etc., Eldon-street, Preston, Lancs.	Eldon-street Mill Company	P. Pickup, Architect, Mercantile Chambers, Burnley	do.
Cottage, Whitewell Bottom, Lancs.		C. Guy, Rosedale, Whitewell Bottom	do.
Alterations to Town Hall	Folkestone Corporation	R. Pope, F.R.I.B.A., 17, Cheriton-place, Folkestone	do.
*Plumbing Work to Artisans' Dwellings, Bethnal Green		Clerk of Works on Job, Barnsley-street, Bethnal Green	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
Land Surveyors	Congested Dis. Board for Ireland		Jan. 30
Electrical Superintendent	Tyne Improvement Commission	150*l.*	do.
General Foreman	Shrewsbury Improvement Com.	2*l.*	Feb. 1
Temporary Engineering Assistant	Coventry Corporation	3*l.* 3s. per week	do.
Assistant Electrical and Mechanical Station Engr.	Tramway Committee, Leicester	160*l.*	Feb. 2
*Clerk of Works	Heston and Isleworth U.D.C.	4*l.* 4s. per week	do.
Sanitary Inspector	Southwark Borough Council	120*l.*	Feb. 4
Buildings and Road Surveyor	Blean R.D.C., 39, Castle-st. Cant'b'y	200*l.*	Feb. 11
*Outdoor Labour Superintendent	Bromley Borough Council	2*l.* 10s. per week	Feb. 17
Engineering Assistant	Wolverhampton Corp.	100*l.*	Feb. 27
*Foreman of Works	Sierra Leone Government Rys.	300*l.* per annum	No date
*Foreman	Admiralty	Not stated	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xi.

TENDERS.—(*Continued from page* 121).

LONDON.—For additional surface water drainage at the Tooting Bec Asylum, for the Metropolitan Asylums Board:—

W. Johnson & Co., Ltd.	£698	D. R. Paterson	498
Cropley Bros., Ltd.	679	E. B. Yewen	479
T. Adams	541	R. E. Mayo	435
C. R. Price	527	J. W. Dean, Ltd.	420
A. C. Soan	500	W. Hall	380
		Gander & Hazell*	359

[Architect's estimate, £490.]

LONDON.—For additions to steam and house coal stores at South-Western Hospital, Landor-road, Stockwell, for Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer and Surveyor to the Board:—

A. Leather	£383	Enness Bros.	£264
West & Richards	325	Gardner & Hazell	230
W. & C. Brown	325	W. J. Coleman & Co.	230
Higgs & Hill, Ltd.	313	Thomas Cole, 125-7, Offord-road, Barnsbury, N.*	224
C. R. Price	311		
Thos. Pearce	299		
H. Bragg & Sons	275		

[Engineer's estimate, £275.]

NOTTINGHAM.—For alterations and additions to office, Park-row. Messrs. A. R. Calvert & William R. Gleave, architects, 18, Low-pavement, Nottingham:—

James Wright* £575 0 0

[Lowest of eight tenders.]

NOTTINGHAM.—For house, Thorncliff-road. Messrs. A. R. Calvert & William R. Gleave, architects, 18, Low-pavement, Nottingham:—

T. Cuthbert* £1,050 0 0

[Lowest of eleven tenders.]

SOOTFORTH.—For the erection of a house at Scotforth, Lancaster, for Mr. J. T. Airey. Mr. J. Parkinson, architect, 67, Church-street, Lancaster:—

Masonry and Joinery: Robert Thompson, Lancaster* £390 0 0

Slating and Plastering: R. Hall & Son, Lancaster* 61 0 0

Plumbing: H. P. Calvert, Lancaster* .. 54 18 0

Painting: E. C. Parr, Lancaster* 14 5 8

SUTTON-ON-SEA.—For bungalow, Sandylands Estate. Messrs. A. R. Calvert & William R. Gleave, architects, 18, Low-pavement, Nottingham:—

Thompson & Son, Louth* £1,050 0 0

[Lowest of eight tenders.]

SOUTHBOROUGH.—For about two hundred yards of deep drainage in the new cemetery, for the Urban District Council. Mr. W. Harmer, surveyor, 137, London-road, Southborough. Quantities by surveyor:—

Martin & Co.	£414 18 0
J. Summerfield	370 17 6
Thomas Potter	312 9 9
Arnold & Sons	301 18 9
A. Dixon & Co.	300 0 0
T. Hallett & Sons	296 16 4
J. Crates & Son	290 0 0
R. O. Jarvis	232 16 9
Punnett & Sons, Tonbridge	215 0 0

STOCKPORT.—For street works (Brook-street Samuel-grove, Clarke-street, Cross-street, etc.), for the Corporation. Mr. J. Atkinson, Borough Surveyor, Stockport. Quantities by Borough Surveyor:—

W. Snape	£5,442 0 6
W. H. Worthington	5,256 4 4
W. H. Eva	5,058 2 3
Gosling & Stafford	5,024 14 5
P. D. Hayes, Stockport*	4,742 9 8

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WALTHAMSTOW.—For tramway works, for the Walthamstow Urban District Council. Mr. G. W. Holmes, engineeer for permanent way, section A. Messrs. J. & S. Enright, engineers for sections B, C, and D.:—

	A	B	C	D
	Permanent Way.	Electric Plant, &c.	Cables.	Overhead Equipment.
	£	£	£	£
W. Griffiths & Co.	59,914	—	7,221	9,740
J. A. Ewart	58,627	—	—	—
Henley's	*57,700	21,500	*7,343	*10,883
G. Law	81,058	—	—	—
R. W. Blakwell & Co...	64,042	—	—	9,522
W. Manders	59,629	—	—	9,522
Acme Wood Flooring Co.	63,993	—	—	—
A. Fasey & Son	67,994	—	—	—
Bruce, Peebles & Co. ..	—	20,861	—	—
Lancashire Dynamo & Motor Co., Ltd.	—	22,685	—	—
Johnson & Phillips	—	21,700	6,825	—
F. Suter & Co.	—	*20,685	7,255	9,048
Mather & Platt	—	21,919	—	—
Electric Construction Co.	—	21,921	—	—
W T. Glover & Co.....	—	—	8,101	—
Siemens Bros. & Co. ..	—	—	7,127	—
Western Electric Co. ..	—	—	7,143	—
St. Helen's Cable Co. ..	—	—	7,676	—
G. Hill & Co.	—	—	—	10,793
Brush Electrical Engineering Co.	—	—	—	9,610
British Thom.-Houston Co.	—	—	—	9,231
Callender's Cable Co. ..	59,567	—	7,039	11,189
J. G. White & Co., Ltd.	59,739	—	7,339	9,446
Do.	—	21,990	—	—
National Electric Construction Co.....	—	22,221	—	13,173
Dick, Kerr & Co., Ltd.	57,700	—	7,343	10,883
Torque E. E. Co.....	—	22,000	—	—
Macartney, McElroy & Co.	55,040	—	7,659	10,245
British Insulated and Helsby Cables, Ltd...	—	—	6,947	9,945
W. Underwood.....	60,476	—	7,959	11,092
International E. E. Co.	—	20,620	—	—
Engineers' estimates ..	75,693	25,000	18,480	15,890

Messrs. Dick, Kerr & Co., Ltd., sub-contractors to Messrs. Henley for A and D.

WELTON.—For laying and supplying 1¼ miles of 3 in. c.i. pipes, etc., and the erection of an engine room and water tower, Bardney, for Welton Rural District Council. Messrs. Elliott and Brown, engineers, Burton-buildings, Parliament-street, Nottingham. Quantities by engineers.

F. M. Thompson & Sons.....	£2,105 0 0
W. H. Pickin	2,050 0 0
F. Miller	2,022 0 0
J. Hutchinson & Son	2,015 0 0
H. W. Parker & Son	1,975 0 0
Bower Bros.	1,960 0 0
Lane Bros.	1,941 7 0
Jenkins & Son	1,897 14 0
H. Ashley.....	1,850 16 4
F. Pattinson.....	1,781 9 6
Langley & Westmoreland, Kirton, Boston*...	1,749 9 0

WEST BROMWICH.—For two iron staircases, with balconies, as additional means of exit from workhouse infirmary. Mr. J. W. Allen, architect, 298, High-street, West Bromwich:—

W. Hayward & Sons, Wolverhampton .. £246 0 0

WHITEHAVEN.—For taking down the Presbyterian Church and Manse, Market-place, and for rebuilding church. Mr. J. S. Moffat, architect, 53, Church-street, Whitehaven:—

Anderson's, Whitchaven: £3,913 19 3
:Full tender for the whole of the work.

WIMBLEDON.—For supply and erection of water softening and storage plant at Electricity Works, for the Urban District Council. Mr. H. Tomlinson-Lee, Electrical Engineer to Council, Durnsford-road, Wimbledon:—

W. Boby	£2,427 0 0
Bowes, Scott, & Western	1,975 0 0
Royles, Ltd.	1,800 0 0
Mather & Pratt	1,750 0 0
T. Waite	1,690 0 0
Badcock & Wilcox	1,526 0 0
Lassen & Hjort	1,450 0 0
Doulton & Co.	1,514 12 10 1,412 9 10 1,399 5 4
Potter & Co.....	1,350 0 0
Gimson & Co.	1,336 0 0
Arthur Koppel	1,200 0 0
Mas-on, Scott, & Co.	1,197 0 0
Paterson Engineering Co.‡.....	1,153 0 0
Kennicott Water Softener Co.	1,150 0 0
Baker's Patent Appliances Co.	958 0 0

‡ Recommended for acceptance.

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The Builder.

VOL. LXXXVI.—No. 3183. FEBRUARY 6, 1904.

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Transept, St. John Baptist, Norwich ..... Mr. J. Oldrid Scott, F.R.I.B.A., Architect.
Studios, Bolton Gardens South ..... Mr. Walter Cave, Architect.
Villa, Sandiacre, Derbyshire ..... Mr. J. R. Poyser, Architect.
Design for House Front in Stone and Bronze ..... By Mr. H. V. C. Smith.

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The Purification of Sewage and Water.

GOETHE once said that "the Germans possess the gift of rendering the sciences inaccessible," while "the English are masters of the art of making an immediate use of any new discovery, until it leads once more to further discovery and fresh action." We doubt whether the Germans of the present day will admit the truth of Goethe's dictum, or whether Englishmen are as certain of their superiority now as at the beginning of the nineteenth century; there can, however, be little doubt that in the application of science to the purification of sewage Englishmen still retain the lead. We do not forget that our knowledge of bacteriology owes much to German research, nor that some of the foremost bacteriologists in this country are of German extraction, but we may fairly claim that the new discoveries in this department of science have been put to immediate use by the English, and that this has led "to further discovery and fresh action." The book which lies before us* furnishes an interesting record of the progress which has been made in this country during the last few years in the science of sewage purification. The fact that foul organic matters can be rendered innocuous by natural agencies must have been observed by the first farmer, but successive generations through countless ages never got beyond the simple fact. It was not until the part played by bacteria in this important change had been discovered that the fact became vital and led to further discovery and fresh action with such rapidity that—it is scarcely too much to say—the whole science of sewage treatment has been revolutionised in a single generation. In his preface Mr. Dibdin refers to a paper read by him before the Institution of Civil Engineers in 1887, when a statement as to the possibility of utilising bacteria in the purification of sewage, otherwise than on land, "was met with pronounced scepticism." To-day possibility has become certainty, and even a Royal Commission has passed a favourable judgment on the subject. In 1887 Mr. Dibdin had "not the slightest doubt but that the future treatment of sewage will be a combined chemical and biological one." To-day it is agreed that, for many kinds of sewage, chemical treatment is unnecessary, and that a satisfactory degree of purification can be effected by bacteria alone. That our knowledge is yet incomplete everyone must admit, but there cannot be two opinions as to the value of the discoveries which have already been made and as to some of the practical applications of these discoveries.

Mr. Dibdin's name is associated with the important experiments carried out by him on London sewage; his first report on the subject having been published in 1892, and it is only natural that he should still regard with special favour the method of treatment which he evolved in the course of these experiments. The principal feature of what is sometimes known as the Dibdin system is "the contact bed," a kind of filter in which sewage is retained for a time in contact with the filtering material and then drained off, so that the bed has alternate periods of work and rest, or, to put it another way, alternate doses of sewage and air. The common objection to this method of filtration is that there is a constant reversal of conditions, and that the aerobic bacteria have not the necessary supply of oxygen when the bed is standing full. The percolating, or "trickling," filter has, therefore, many advocates; in this method the sewage is distributed over the surface of the filter in small streams or drops, and drained away at the bottom in such a manner that the body of a filter is never waterlogged. The difficulty in this case is to insure an equal distribution of the sewage and to prevent the choking of the distributors. The relative merits of the two methods of filtration are still keenly discussed, and it is somewhat surprising that Mr. Dibdin does not expressly state his own opinion on this important point. He gives a number of reports in which results obtained by the rival methods are recorded, and leaves the reader to form his own conclusions. From the author's point of view, this method of book-making possesses undoubted advantages, but it is not exactly what the reader, who naturally looks to the expert for guidance, has a right to expect. It is true that Mr. Dibdin, in summarising his experiments on the biological filtration of London sewage, concludes "that the contact of the micro-organisms with the effluent to be purified must be effected by leaving such effluent to rest in the filter for a greater or less time, according to the degree of purification required," and "that after each quantity of effluent has been dealt with, the micro-organisms

* "The Purification of Sewage and Water." By W. J. Dibdin, F.I.C., F.C.S. Third Edition, revised and enlarged. London: The Sanitary Publishing Co., Ltd., 5, Fetter-lane, E.C. 1903.

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must be supplied with air, which is readily effected by emptying the filter from below, whereby air is drawn into the interstices." These are the conditions under which sewage was purified by means of contact beds in Mr. Dibdin's London experiments, and we may assume that they were regarded by him as essential at the conclusion of those experiments in 1896; but he would be a bold man who to-day ventured to state so dogmatically that purification of a tank effluent by filtration "*must* be effected by leaving such effluent to *rest* in the filter." The fact that trickling filters have given as good results as contact beds confounds both the "must" and the "rest."

Chapter V. is devoted to the experiments carried out at Sutton (Surrey) under Mr. Dibdin's direction. The first experiments (1894-1896) were on similar lines to those at the London outfall, tank effluents being treated in contact beds; but in 1896 a new departure was made—crude sewage was treated by contact in a primary coarse bed, and the effluent from this was treated in a secondary finer bed. The results of the first two and a half months' work were given in a report by Mr. Dibdin, and led him to make a statement on which great expectations were unfortunately based. "It appears from these results," he wrote, "that a bacteria tank or tanks of an area of half an acre will be sufficient for the complete disposal of the sludge by this system, without any expense for labour other than that necessary for turning on the valves and raking over or digging with a fork the surface of the ballast from time to time as may be required to break up the surface coating of fibrous matter; up to the present time this has been found to be necessary on only two occasions." The sewage at Sutton is entirely domestic, and later experiments have shown that the sewage of many of our large towns cannot be satisfactorily treated by contact beds alone. There must be not only preliminary screening, but also sedimentation, the latter being usually accompanied by an appreciable amount of bacterial action, or the primary bed will sooner or later be rendered almost inoperative by the choking of the surface and of the interstices in the body of the bed. The treatment of crude London sewage by contact beds alone was tried by Mr. Dibdin's successor, and proved a failure, and after exhaustive experiments at Leeds with coke beds "it was found impracticable to deal with crude or partially settled sewage, not because good effluents could not be obtained, but because the capacity of the rough bed could not be maintained; and when accumulations arose, a large part of them, having reached an irreducible stage, could not be consumed by resting the beds." The longest chapter in the book is devoted to the experiments at Leeds, and it is somewhat curious that Mr. Dibdin does not mention the fact that, for the first twelve months (October, 1897, to October, 1898), he was the chemist under whose advice the experiments were carried out.

"The septic tank and other systems" are described in the sixth chapter, in which brief mention is made of Mr. Cameron's work at Exeter and Mr. Scott-Moncrieff's at Ashtead. Seven of the twenty pages of this chapter are devoted to an account of Stoddart's filter, and other filters and sewage distributors are also described. In the next chapter Mr. Dibdin institutes a comparison between land treatment and bacteria beds, and concludes that "the bacterial process worked out at Barking Creek and Sutton is *land treatment*, but concentrated, accelerated, and controlled; whilst land treatment as generally practised is haphazard, uncertain, and expensive." The chapter is, however, too short to be convincing. The well-known experiments at Manchester are described at length in the next chapter, and here, as in the case of the Leeds experiments, Mr. Dibdin does little more than present a condensed version of the report published by the Corporation. Nine pages are devoted to the bacterial treatment of factory refuse, and the following chapter on "screening" is nearly as short as the famous chapter on "Snakes in Iceland"; two plates illustrating John Smith Co.'s self-acting screen and Latham's "solid sewage extractor" are, however, given in connexion with it.

To Londoners the purification of the Thames is a matter of great importance, and Mr. Dibdin's name was for a number of years so intimately associated with the subject that his account of the past and present conditions of the river cannot fail to be of interest. He strongly advocates the adoption of bacterial treatment for the final purification of the sewage effluents at Barking Creek and Crossness, and adds, "I candidly confess that I look forward to the adoption of the coke-breeze bed system, which I worked out at Barking Creek . . . as the coping stone of my life's work in effecting the purification of the Thames."

Chapter XIII., entitled "The Discharge of Sewage into Sea-water," consists almost entirely of extracts from reports by medical men on the connexion between infectious disease and sewage-polluted shell-fish, and Mr. Dibdin is strongly of opinion that the discharge of crude sewage into streams flowing directly over or near oyster, cockle, or mussel beds, or into the sea itself "within a considerable distance of any seaside resort," ought to be absolutely prohibited.

The five following chapters deal with the filtration and systematic examination of potable water, the character of the London water supply, the action of soft water upon lead, and the absorption of atmospheric oxygen by water. Mr. Dibdin's account of the London water supply is very interesting, and every householder would rejoice if some method of softening the water were adopted by the companies. Mr. Dibdin has made experiments on the subject, and believes that the softening process would not only reduce the hardness, but also remove about 25 per cent. of the dissolved organic impurity and 87 per cent. of the bacteria. "It would therefore seem," he says, "that, by the adoption of the system of softening, the present supply, *in respect of its chemical quality and number of bacteria*, would be improved to a degree comparable with that of the Welsh supplies." The words which we have taken the liberty of printing in italics are notable, and may be misleading to the ignorant reader. The *number* of bacteria in a sample of drinking water is of trifling importance in comparison with their *nature*, and one of the principal objections to those London water supplies which are obtained from the Thames is that the bacteria in the river include bacteria derived from sewage and from manured lands, and that some of these are pathogenic. What is required in making a comparison between filtered Thames water and water from the Welsh mountains is not only a quantitative, but also a thorough qualitative, bacteriological examination.

The nineteenth chapter is entitled "Analyses and their Interpretation," and brings us back to the sewage problem. It is followed by "The Ventilation and Deodorisation of Sewers," and a summary of the reports already issued by the Royal Commission on Sewage Disposal. Two appendices, dealing with methods of analysis, are added.

There is still much to be learnt in connexion with sewage treatment, but the short account of Mr. Dibdin's work which we have given will show that he has covered a wide field. He has had great practical experience, and writes, therefore, with authority. By medical officers and engineers his book will be warmly welcomed, and the lay reader interested in municipal affairs will find it well worth perusal. The book is a clearly-printed volume of about 400 pages, and contains about forty illustrations and diagrams, eighty tables, and a good index.

"LEAD ARCHITECTURE."

By Sir George Birdwood, K.C.I.E.

THE direct purpose of the scholarly and inspiring paper on "Lead Architecture" recently read by Mr. Starkie Gardner before the Royal Institute of British Architects was to advocate the larger use of lead, not only in the decoration, but in the construction of buildings, both private and public; but it also, indirectly, suggests a reference to the salient statistical facts of the present position of the production and manufacture of lead in this country, which are full of cautions for all those who are anxious to cast a right and true vote on the great fiscal question now before this country; and to these figures I would desire, very briefly, to call attention; for they deserve the most searching and deliberate consideration.

It is not necessary to go into any ancient, or mediæval, or modern history to show our continuous pre-eminence from the time when, according to Pliny [vii., 56 (57)], "Plumbum * ex Cassiteride primus aportavit Midacritus" [*i.e.*, the Phœnician "Melkart"], down to the XIXth century in the export of lead and leaden wares. Nearly all the older French churches and palaces were covered in with British lead; and Louis XIV. used "32,000,000 livres" of "English lead" on the roofing of Versailles. The catastrophic decline in the production of

* Plumbum here means "lead," or includes lead. Pliny distinguishing tin ore as "p: candidum" and tin in bars as "stagnum,"—after IVth century A.D. "stannum" [xxxiv., 16, (47)], the *Kassiteros* of Homer. Assyrian *Kazasatira*, Accadian *Kasdura*, and Sanskrit *Kastira*. Compare "Cassiter St." Bodmin!

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British lead began late in the XIXth century, and during the last thirty years has continued at a rate which seems to threaten its extinction in another decade or two. Thus the production was :—

In 1877	.. ..	80,850 tons.
„ 1887	.. ..	52,563 „
„ 1897	.. ..	35,338 „
„ 1902	.. ..	24,606 „

For some time previous to this decline the production was not equal to our consumption of lead; but its diminution is not to be traced to any exhaustion of our lead mines, and is to be attributed for the most part to the comparative cheapness with which lead was, and still is, worked in other countries—Spain, United States of America, New South Wales, South Australia, etc.; the total imports of lead ore, pig lead, and sheet lead into the United Kingdom from other countries having amounted in 1902 to 327,244 tons, as against our output, as shown above, of 24,606 tons. In the same year our exports of foreign lead ore, pig lead, and sheet lead amounted to 23,142 tons; and of British lead ore, pig lead, sheet lead, and lead piping and lead tubes—some of which articles were, I presume, manufactured of foreign lead — to 34,987 tons; thus leaving an immense residue for home consumption. The fall in the price of lead is shown in the following figures :—

1873	.. ..	23*l.*	6	0 per ton.
1883	.. ..	12*l.*	18	0 „
1893	.. ..	9*l.*	16	11 „
1902	.. ..	11*l.*	4	8 „

Now, although our mines are not exhausted, the production of them could not have been raised to the stupendous proportions of the importations of foreign lead; and without the cheapening of lead caused by these foreign importations there would have been no possibility of the extended and in every way highly advantageous use of lead that has been followed in this country during the last thirty years, and no possibility of its yet wider application in architecture as proposed by Mr. Starkie Gardner; or, in other words, of the restoration of lead to its proper place in the architecture of this country, where lead was intimately associated with the whole scheme of our domestic and social life long before the building of our dwellings had been developed into the master art (as it is for every country) of all its truly national and idiosyncratic arts. Man does not live on bread alone; and it must not be overlooked, in the consideration of the question now before the voters of this country, that the revival of the arts of this country during the reign of the Queen-Empress Victoria was profoundly influenced by "Free Trade," and free popular intercourse with the Continent, and the free immigration into this country of "undesirable aliens."

Of course, to restore prosperity to our actual lead mines in Cornwall, Flint, Cardigan, Derbyshire, Durham, Cumberland, Westmorland, etc. (the Isle of Man has suffered nothing from the competition of the foreigners), there would be nothing like raising the price of lead again, by means of a duty on imported lead, to 20*l.* a ton; and by the lead we then took of the foreigner the whole nation would benefit to the extent of the duty paid on it. But is the inevitable decay in the spiritual life of the country which would follow on the adoption of anything like a general "protective" tariff to count for nothing? I am advancing no plea, but simply emphasising one of the several cautions forced on me by the reading of Mr. Starkie Gardner's illuminating paper.

As to its immediate object, I would fain be permitted to add that lead readily conducts heat and cold; a fact which made "the leads of Venice"—the prisons in the roof of the Ducal Palace of St. Mark—proverbial throughout Europe by reason of their frightful heat during the months of summer. But lead might well be used for winter gardens, orangeries, riverside residences subject to flooding, bridges, fountains, and statues of the indicative class, such as the archer at one time placed in front of, or over the entrance to, military barracks —whence such phrases as [*Othello* I., 1] "lead to the Sagittary."

NOTES.

Municipal Borrowing.

WE recently referred to the remarks of Sir Michael Hicks Beach on borrowing by municipalities. It appears that there is more than one corporation which has a huge overdraft with its bankers. Cardiff has been given as an instance in respect of advances for public works. The "tight" condition of the money market and the fact that it is overloaded with stock is said to be the reason for this state of things. It suggests, however, that some local bodies begin work before the funds out of which they should be paid are in hand. If public bodies begin public works and finance them in the first instance by loans from bankers it is pretty clear that the ratepayers' control of expenditure is lessened. It is only when the question of an addition to the rates in the form of a loan by an appeal to the public is raised, that those who are chiefly interested can say if it is desirable to incur this liability. The present stringency of the money market is thus in many ways fortunate, as it will cause local bodies to consider carefully as to the desirability of new works. Those which are necessary will, of course, have to be undertaken; those which are not actually pressing may well be postponed.

By-Laws and Building Schemes.

THE case of Harrogate Corporation *v.* Dickinson should be noted by builders. The defendant was a builder who had deposited and obtained the approval of the Corporation of Harrogate for plans for eleven houses and two coach-houses and stables on October 8, 1894. The defendant had erected some of the houses and one stable and coach-house, but had not completed the rest when on November 7, 1901, the by-laws regulating buildings were altered. Section 27 of the Corporation's Private Act provided that the deposit of any plan of any street or building should be void unless the work specified in such plan should be commenced within three years of the date of the deposit. The defendant contended that he had commenced the work specified in the plan in question, and was therefore entitled to complete it under the old by-laws, but the Divisional Court have affirmed the court below in holding that under this section the plan did not include the whole scheme set out upon it, but must be regarded as separate plans for the erection of each building. It may also be noted that the new by-laws contained a saving clause as to "any work commenced" before a certain date, and that it has been decided in the case of White *v.* Corporation of Sunderland (April 21, 1903) that what constitutes a commencement of the particular work is a question of fact to be decided in each case.

Structural Effects of the Chicago Fire.

FROM a careful examination of the Iroquois Theatre, it appears that the amount of damage done to the building has been very small indeed, although the condition of various exposed parts indicates that a very high temperature prevailed. One result was the destruction of the scenery on the stage and in the scenic tower, and as the play was of a spectacular character the loss was heavy. A bridge used for painting purposes at the back of the stage, and composed of two light lattice girders, was badly warped and twisted. The heating pipes along one wall of the stage were much twisted, and some of them have fallen to the stage. Some iron ladders, at a height of 60 ft., on either side of the stage had sagged from their own weight, and a gridiron of steel beams, at a height of 75 ft., showed evidence of having been subjected to great heat, and some of them had sagged nearly 3 in. Beyond the damage here mentioned, and the destruction of seats, decorations, and plastering in the auditorium, the effect of the fire was not serious. The fireproof floors and roofs were not damaged either by heat or by water. The partitions, dividing various dressing-rooms from the stage, formed a complete barrier to the progress of the fire, and it is worthy of note that these were subjected to a very severe fire test, and were in a direct line with the fire hose. The columns in this partition were covered with wire lathing and plaster, and their protection remains intact. A Roebling floor in the pit is absolutely uninjured except at one point where a heavy weight fell through it. Although the front rail of the balcony was badly twisted, the wire lathing of the suspended ceiling and of the columns was nowhere exposed. The girder supporting a heavy brick wall over the proscenium arch was protected with cinder concrete and wire lathing covered with plaster. In this case the plaster was destroyed, but the concrete remained intact. It is remarkable that so fierce a fire should have produced so little structural injury, and this fact in itself is a very strong argument in favour of fireproof construction.

London Traffic.

IN a letter to the *Standard* a few days ago Sir H. E. Knight gives some further details of the proposals brought forward in his evidence before the Royal Commission on London Locomotion. Our readers will remember that three suggestions were then made for relieving the pressure of traffic and for dealing with the transport of goods in the metropolis. Of these the plan for a tubular goods railway certainly deserves serious attention. If such a line were constructed so as to

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establish communication between all the docks, river wharves and warehouses, railway goods stations, Metropolitan markets, and great business centres, it is highly probable that a very considerable proportion of the total goods traffic of London could be conducted without using the public streets. We understand the suggestion is that the tube should be large enough to admit the ordinary rolling stock used by railway companies, so that entire wagon loads of goods could be transferred to the underground line by means of lifts or inclines without transhipment at goods depôts. Even if the whole of the goods traffic could be dealt with in this manner large quantities of merchandise would still have to be carted to the various stations on the proposed line, and goods would also have to be delivered in vans from the various stations; but such traffic would not necessarily be along main thoroughfares. A scheme of this nature should be of immense service in dealing with the traffic problem of London, but a huge system of such lines would be required to produce a perceptible effect. The idea is by no means new, but we are glad to see it brought forward again.

Tramway Traffic. A PAPER in the last official circular of the Tramways and Light Railways Association is devoted to a consideration of the best means for the encouragement of urban tramway traffic. The author is probably correct in saying that it is unnecessary to pay attention to those who enter tramcars for the mere pleasure of riding, and also that comparatively few passengers use tramcars for the purpose of saving trouble and fatigue. For both these classes of traffic horse cars or even omnibuses are quite good enough. The rise and development of modern electric traction certainly appears to confirm the view that the saving of time is the most important element, and that the financial success of a line will be in proportion to the time saved for its customers. We have ample evidence in the existing management of the various London tramway systems that this essential condition has not yet been fully realised. It is perfectly clear that great waste of time is caused by the excessive number of stopping places now provided, and, as a matter of fact, the average speed of electric cars is but little greater than that of the horse cars which they have displaced. The author of this paper has evolved an algebraic formula for determining the most suitable number of stopping places per mile, and he arrives at the fairly obvious conclusion that, from the passengers' point of view, no advantage is gained by fixing the stopping places closer than a quarter of a mile apart. Even this distance is certainly too small during the morning and evening traffic, when it is practically impossible for seats to be secured except at a few intermediate stations. Therefore at such times there is no reason why more than one or two stopping places should be provided in every mile. The reduction of interruptions to the journey would permit the intervals between each car to be diminished, and so a much larger number of passengers could be conveyed over the line, with satisfactory results to all concerned.

High-Speed Traction. WITH the thoroughness characterising the German nation, the experiments in high-speed electric traction are being continued at Zossen, and speeds of more than 130 miles an hour have already been attained. These trials are being conducted in a thoroughly practical manner with a perfectly definite object. Possibly the investigation was not entirely unassociated with the desire to convey troops from point to point with rapidity in case of emergency, but it is perfectly clear that the movement was also inspired by the wish to improve traffic facilities generally. We have learned already that a high-speed electric railway is to be constructed between Hamburg and Berlin, on which the speed of 100 miles an hour is contemplated, and it is said that this will be merely the forerunner of many similar lines traversing all parts of the empire. The project certainly ought to be watched with close attention on this side of the channel, where means of rapid transport are urgently required, notwithstanding the comparatively small distances from city to city and town to town. Average speeds of fifty miles an hour may seem to be quite fast enough for some people, but busy men who are called upon by the exigencies of their work to travel at frequent intervals between the metropolis and various manufacturing centres have to waste much valuable time in railway trains. Moreover, the necessity for frequent journeys seems to increase as time rolls on, and high-speed railways would meet an undoubted want.

Slag Portland Cement. PORTLAND cement has been made from blast-furnace slag for several years in various German and Belgium works and appears to have given satisfactory results. In some respects blast-furnace works are favourably situated for the manufacture of cement, because motive-power can be furnished by blast-furnace gas engines, waste coke can be utilised in the kilns, and the principal raw materials are generally close at hand. The opinion is entertained in Germany that the manufacture of slag cement can be more readily controlled than that of cement made in the ordinary way, as furnace-slag is a product whose chemical composition is easily regulated. Some recent tests, made in the municipal laboratory at Vienna, upon blast-furnace slag cement in the form of 1 : 3 mortar gave the following satisfactory results: (1) Age, seven days: tensile strength, 383 lb. per square inch; compressive strength, 3,880 lb. per square inch. (2) Age, twenty-eight days: tensile strength, 551 lb. per square inch; compressive strength, 5,411 lb. per square inch. Isolated tests of cement mortar are, of course, by no means conclusive, but the figures here quoted certainly deserve consideration.

Sanitary State of Spennymoor District. A REPORT by Dr. Reece to the Local Government Board, in regard to the sanitary condition of the Spennymoor Urban District (Durham), while stating that many of the working-class houses in the district are in good condition, adds the following statement:—

> There are, however, houses which cannot be regarded as satisfactory from a public health point of view. Some few dwellings are so damp and dilapidated that action in regard of them under the Housing of the Working Classes Act is desirable. Again, there are back to back houses, and houses without windows or doors at the back which have all the drawbacks of back to back houses. And there are houses which have but one room, with a small cupboard opening from it, which is used as a scullery or larder. In such dwellings there is generally an attic under the tiles, approached from the living-room by a ladder, but this room is often unceiled. From time to time the Medical Officer of Health reports on this class of house, and some of them have been altered so as to improve their sanitary condition, i.e., the attics have been ceiled, etc. Overcrowding and all its attendant evils are almost inevitable in such houses. . . . Attention should be drawn to a common and very serious defect in most of the dwellings in the district. Many of the back yards are indifferently paved with porous brick, and in addition the bricks are often broken and the yard surface uneven; hence slop water and washings of the polluted surface of the yards lie ponded close to the back doors of the houses.

Dr. Reece, however, seems to consider that the real and greatest evil in the district is the want of a complete and efficient sewerage system, and gives some details as to the unsatisfactory arrangements at present existing for drainage and excrement removal. It is stated that the attention of the District Council has been repeatedly directed to this state of things, but that hitherto they have taken no steps to remedy it.

The Measurement of Radio-Activity. AS QUESTIONS are sometimes asked relative to the measurement of the phenomena exhibited by radio-active substances it may be useful to note the method adopted by M. and Mme. Curie. The substance in question is placed upon one of two condenser plates charged to a high potential. Air between these plates is rendered conductive by the presence of the radio-active substance, the activity of which is determined by measuring the quantity of electricity passing within a given time. By taking as a unit the conductivity imparted to air, under similar conditions, by uranium, the relative activity of any other radio-active substance can be expressed numerically. Thus, if it is said that the radio-activity of radium is x, this means that the quantity of electricity caused to pass from one condenser plate to the other, by a certain weight of radium, is x times the quantity that would pass if an equal weight of uranium were substituted. The quantity of electricity passing within a given period may be determined by an electrometric method, or the time occupied by the passage of a given quantity of electricity may be measured by the aid of an electroscope. In the latter case observations are made by means of a telescope fitted with a micrometer scale, and the time is taken by a chronometer. Such methods are thousands of times more sensitive than spectrum analysis, and still more sensitive than chemical analysis.

Two Old Street Tablets: Clare Market. IN the course of the demolitions now in progress for the laying out of Kingsway have recently been removed the carved stone tablet or sign from the house at the corner of Vere and Clare streets, and the memorial tablet from the "Royal Yacht" public-house at the corne

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(south) of Denzell and Stanhope streets. The former, a sculptured sign of two negroes' heads in profile with the initials "W. S. M." and date "1715," had been affixed to the wall at the splayed angle of the house, No. 13, Clare-street, latterly a baker's shop, and possibly had some association with Blackmore, also known as Blackamoor, street in the immediate vicinity. The large tablet of stone had been set in a reveal in the north wall of No. 49, Stanhope-street, and was originally erected as a memorial of Denzell Holles, second son of John, first Earl of Clare, who lived to an advanced age. As the inscription is of a somewhat unusual character, we transcribe it at length :—

Denzell Street—1682 So called by Gilbert Earle of Clare in Memory of his Vncle Denzell Lord Holles who dyed February ye 17th: 1679 Aged 81 years: 3 months a great honour to his name and the exact paterne of his fathers great Meritt John Earle of Clare

Below the inscription is inserted, in a different and later style of lettering, "Rebuilt by Hy. Cocker 1796." John, second Earl (*obiit* 1665), had long been a resident there, and, in or about 1653, founded the flesh and fish market, originally New Market, which Howell mentions in his "Londinopolis," 1657. In 1643 Charles I. licensed Gervase Holles to erect a certain number of houses on the north-west of the later market square: the Bill of 1657 for preventing an increase of buildings reserved the right of the Earl of Clare to continue building in that part of the town.

Royal Academy Lectures.

PROFESSOR CLAUSEN'S closing lecture, delivered on Thursday last week, on "Realism and Impressionism," was a kind of summary of the news expressed in the preceding lectures. As an example of the highest idealism in painting might be taken Michelangelo's Sistine Chapel, the greatest painting in the world, which included every great quality of painting—drawing, colour, and expression—in complete balance. Reynolds, though constantly referring in his lectures to the greatness of Michelangelo, nevertheless himself followed rather the Venetian school, evidently recognising Michelangelo as an ideal out of his reach. It was of no use to think of imitating Michelangelo's manner without his spirit; Stevens perhaps alone among modern artists had caught something of both. Failure in idealism arose from thinking of matter more than mind. Realism was of two kinds; it might be a realism merely of external facts, or a realism of character, though not giving facts exactly; or there might be a balance between the two. Mere realism of surface was false—an evasion of difficulties; the sum of little details did not give the whole, though (as Van Eyck, Holbein, Madox Brown, and Millais had shown) minute detail was not incompatible with breadth. Realism of character did not depend on realism of externals; it was the result of abstraction, and was mostly arrived at towards the end of an artist's life. Realism in detail was only suitable to real subjects; minutely finished and embroidered costume, for instance, was out of place in representations of ideal and imaginary personages. The finish of such detail in Botticelli's pictures was only acceptable because that early detail had itself become legendary to us. Consistency must be maintained, and a picture might in fact appear more real for being less realistic. The painting of objects as an end in itself was a mistake; the artist should give his reading of the subject. It was difficult to draw a precise line between realism and impressionism, but the school called Impressionist arose in the fact that the study of colour as affected by light seemed to offer a new field. In this sense Turner was the first and greatest impressionist. Manet and others had tried painting in spots of colour in order to preserve the effect of colour and sunlight; the result was interesting, but was it beautiful? De Hooghe could give the effect of colour and sunlight without any such method: you had only to take a lower key. Impressionism was a far too self-conscious form of art, though it had attained some truths as to light and colour. If it were asked, How far may we follow old conventions? he would say, as far as you need them and understand them. Pictures and nature threw light on each other, and there must be some point of reconciliation between old and new conventions. Touching on the subject of Japanese art, Professor Clausen thought that while it was an art which in its own way gave great pleasure, the adoption of its system in Western art could only be an affectation. Japanese art was essentially that of children—not childish, but childlike. Their method of making pictures by simple masses of colour was interesting in itself, but it was not our nature to see things in that way. The aim of the educated artist should be to find out which out of many possibilities he really wanted, and endeavour to develop that.

LETTER FROM PARIS.

THE death of the Princess Mathilde, the cousin-German of Napoléon III., has been a loss to the world of Art in Paris. Both under the Empire and under the Republic she had remained entirely apart from politics, and her Salon was a neutral ground, where the representatives of Art, Literature, and Science met without regard to political opinion; and all parties in the State were represented at the funeral of the "Bonne Princesse." She has left to the Louvre some gifts of real value, among them a portrait of a lady by Reynolds, that of the Prince Impérial by Jules Lefebvre, portraits of King Jerôme and of Prince Napoléon, by Hippolyte Flaudrin, a "Pompeian Interior" by Boulanger, and the portrait of Giraud, the painter, by Paul Baudry. The Carnavalet Museum and Musée des Arts Decoratifs have also received important additions to their galleries.

The appointment of M. Homolle as Director of the National Museums, in place of M. Kaempfen, who has retired at the age of seventy-seven, has given general satisfaction. M. Homolle was a brilliant student, in the first instance, of the French School at Athens, of which he has been for the last ten years the Director, during which period he was fortunate enough to have the great chance of the explorations at Delphi put into his hands, and carried them out in so successful a manner. M. Chaumié, the Minister of Public Instruction, when visiting Greece two years ago, had the opportunity of making the acquaintance of M. Homolle, and seeing the work which he had carried out at Delphi, and has now selected him to fill the still more important post left vacant by M. Kaempfen's retirement.

One of the first matters with which the new Director will probably be concerned, is the important question of the reconstruction of the Luxembourg Museum, the oldest of the museums of modern art in Paris, and also of one which is in the most deplorable condition. He will probably receive the complete support of the Department of Public Instruction in the carrying out of this great scheme, the necessity for which has only recently been strongly urged on the Government in a petition to Parliament from the Society called "Les Armis du Luxembourg."

This last-named Society, whose enlightened zeal in the cause of art has been successfully exhibited on two or three important occasions, has taken the initiative in a proposal for giving to artists and their widows a more or less permanent copyright value in the sale of their productions, similar to that of authors' rights in the sale of literary works. There may be some difficulty about the arrangement of the system to be employed in carrying this idea into practice, but it is believed that it will receive serious consideration, since it is generally admitted that artists are at present in a far less advantageous position in regard to any benefit which their heirs might obtain from the value of their works, than literary or dramatic authors or musical composers. The Société des Artistes Français (Old Salon), is at present occupied, also, with its scheme for the benefit of artists, viz., the creation of pensions "de retraite," in favour of artists who are too old to continue the practice of their art. According to the scheme which M. Boisseau, the Secretary and Treasurer, has been instructed to draw up, it is proposed that the conditions for obtaining this pension should be that the recipient should have been thirty years a member of the Société, and be seventy years of age. He must also have exhibited at fifteen of the annual exhibitions during the period of his membership. An exception will be made, however, to this last condition in the case of architect members, whose exhibition of works at the Salon is naturally much more irregular and intermittent than in the case of the other classes of exhibitors.

At the Ecole des Beaux-Arts no decision has yet been taken as to the appointment of any one to succeed Gérôme as Chef d'Atelier of the painting section of the school. M. Dagnan-Bouveret was at first talked of, but it seems likely now that the choice will lie between M. Ferdinand Humbert and M. Albert Maignan.

There is talk again about lighting the Bois de Boulogne by electricity, provided the State will pay half the cost. In that case, lighting would be established along the avenue leading from the Porte Maillot to the Porte Dauphine, along the one leading to the lakes, and on the drives round the lakes. The change would not only render the promenades more attractive on summer nights, but also render them more safe than, in spite of the police patrols, they can be said to be at present.

It is proposed to erect a monument to the poet André Chenier, who was guillotined under the Revolution. The position is not yet chosen, but the committee have commissioned M. Denys Puech to prepare a model, in which the medallion portrait of Chenier will be accompanied by a reproduction of M. Puech's figure the "Jeune Captive," which is in the Luxembourg Museum. M. de Saint-Marceaux has just completed the full-size model of the monument which is to be erected by public subscription to the memory of Dumas *fils*, opposite that of the elder Dumas on the Place Malesherbes. The monument, which is to be executed in stone, is a fine and harmonious composition. It represents Dumas seated in a flowing robe, and with a pencil in his hand, with a group of draped figures at one side of the circular pedestal, who are supposed to symbolise the principal works of Dumas, especially the "Dame aux Camélias." Behind this pedestal is another figure personifying Youth. The monument will count among the best works of M. de Saint-Marceaux, who, it may be added, is well represented at this moment by his work exhibited at the salon of the "Union Artistique," popularly called "L'Epatant," which has just opened, where there is also some good sculpture by MM. Carlès, Verlet, and Crank. Among the paintings at the same exhibition is a splendid portrait of Gérome by M. Aimé Morot, and pictures by MM. Chartran, Roybet, Bonnat, Jacques Blanche (who recalls more and more the style of the English painters of the XVIIIth century), Detaille, Dagnan-Bouveret, Billotte, and Walter Gay.

The jury in the competition for designs for the reconstruction of the Hotel de Ville of Troyes has awarded the premiums of 12*l.* each to the following architects who will now take part in the final competition: MM. Balley

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and Monceau, of Saintes and Paris; H. le Grand, Paris; Guillaume Tronchet, Paris; Robert and Hameau, Paris; Charles Duval and Robida, Paris; and Emile Hochereau and Gabriel, Paris. The competition organised by the Minister of the Interior for designs for the construction of a hospital at St. Maurice, has been decided as follows: The execution of the work to MM. Bassompierre-Sewrin and Fiault, architects, Paris; 2nd, premium of 40*l*., to M. Tronchet, Paris; 3rd, premium of 20*l*., to M. Quarez, of Fontenay-sous-Bois.

The jury for the annual "Concours de Façades" has arrived at a decision, and the six buildings following have been premiated: No. 17, Rue Lafitte, architect, M. Nénot; 38, Rue Fabert, architect, M. Hodanger; 133, Boulevard Menilmontant, by M. Bocage; 23, Rue Mogador, by M. Labouret; 164, Rue de Courcelles, by M. Delage; and 45, Rue de Bellechasse, by M. Muscat. A gold medal has been awarded to each of the above architects, and bronze medals to the contractors.

The following subject has been given for the annual competition in decorative architecture called "Concours Achille Leclerc," at the Ecole des Beaux-Arts: "A Grand Staircase for a Museum." The staircase, starting from a monumental vestibule, is to give access on its first landing to the principal hall of the museum situated between the levels of the ground and first floors, and on the main landing on the first floor to the other rooms situated at a height of 30 ft. above the floor of the vestibule. The portions of the buildings contiguous to this staircase are to be indicated on the drawings, and the preliminary sketches should be to a scale of 1-16 in. to a foot for the plans, and ⅛ in. to the foot for the sections. The final drawings, which the students have to send in by March 2, are to be on the scale of ¼ in. and ½ in. to the foot for the plans and sections respectively. The Godebœuf competition, the subject for which was "Une Marquise Vitrée," was decided in favour of MM. Boutin, Camille Lefevre, and Pierre Aubey, to whom first medals are awarded. M. Février, pupil of M. Marcel Lambert, carried off the prize in the Labarre competition, the subject for which was "Un Hotel pour Ouvriers."

The visit of the "Société des Amis des Monuments et des Arts," organised by M. Charles Normand, architect, was made this month to the buildings of the Théâtre Français. The party was conducted by M. Guadet, the architect of the building. MM. Guadet and Prudent gave a short historical description of the various theatre auditoria constructed by the architect Louis, culled from the documents they had got together for this purpose.

The new Coquelin-Binet theatre to be constructed at Paris will be entirely built of armoured cement, from the special designs and ideas of the actor and the architect named above. M. Coquelin and M. Binet have asked the Municipality of Chicago to allow the reconstruction of the Iroquois theatre to be undertaken on this system.

The competition organised by the proprietors of the Grand Hotel at Paris, for schemes for the transformation of the present courtyard into a winter garden, with an entrance from the Rue Scribe, has been decided in favour of M. Lucien Bechmann, a young Parisian architect, late pupil of M. Laloux. The premium awarded to M. Bechmann is 100*l*., and second and third premiums of the value of 80*l*. and 60*l*. respectively have been awarded to M. Jean Fugairon and M. Olivier Carré, both architects of Paris.

It has been decided to demolish the important barracks situated on the Boulevard Lannes, just in front of the fortifications, and this decision would appear to be the commencement of the preparatory work for demolishing the fortifications of Paris from the Porte Maillot to the Point du Jour. The barracks will be reconstructed just outside the present line of fortifications.

The Prix Lheureux, a foundation prize at the disposal of the Town of Paris, to reward each year and alternatively the finest work accomplished by an architect or a sculptor, has just been awarded to M. Pascal, architect, member of the Institute, President of the Academie des Beaux-Arts for 1904, for his important work of the completion of the Bibliothèque Nationale. This prize was carried off for the first time in 1900 by the late sculptor Dalou, for his monument on the Place de la Nation, the Triumph of the Republique; in 1901, by M. Charles Girault, for the Petit Palais des Champs Élysées; and in 1902 by M. Barrias, for his monument to Victor Hugo.

The Academie des Beaux-Arts has elected M. Pascal, the well-known architect, President for 1904; M. Edouard Détaille becomes Vice-President in the place of M. Pascal.

The officers for 1904 of the Société Centrale des Architectes are: M. Nénot, President; MM. Etienne, Bartaumieux, Bellemain, Vice-Presidents; MM. L. Géorge, Chief Secretary; Nizet, Archiviste; and Poupinel, Treasurer. The Société had requested both M. Pascal and M. Daumet to offer themselves as candidates for the Presidentship, but M. Pascal declined for reasons of health, and M. Daumet on account of his advanced age. The officers of the Société des Artistes Français for 1904 are as follows: M. Tony Robert-Fleury, President; MM. Nénot and Coutan, Vice-Presidents; MM. Albert Maignan, Chief Advising Secretary; Boisseau, Treasurer; and Richemont, Géorges Lemaire, Pascal, and Mongin, Secretaries. The Société des Architectes Diplomés has elected the following officers for 1904: President, M. Louis Bonnier; Vice-Presidents, MM. Defrasse and Albert Guilbert; Chief Secretary, M. Léon Davouste; Librarian, M. Jalabert; Treasurer, M. Maurice Poupinel; and MM. Maurice Glas, Roger Bouvard, and Payret-Dortail, Secretaries.

The Committee of the Société Nationale des Beaux-Arts has decided that the New Salon of 1904 will take place from April 16 to June 30. Works of Architecture and Sculptures are to be sent in on March 18 and 19, and works of Painting on March 8 and 9.

M. Stanislas Ferrand, architect, manager of the building journal *Le Bâtiment*, has written a letter to Mr. Andrew Carnegie in reference to the proposed Palace of the Tribunal of International Arbitrage, for the construction of which Mr. Carnegie has just handed to the Dutch Government a first sum of one and a half million dollars, asking him to allow this building to be the subject of an international competition.

The scheme of prolonging the Boulevard Raspail from the Rue de Vaugirard to the Boulevard du Montparnasse has now been declared of "public utility," and the Prefect will at once proceed with the negotiations for the expropriation of the ground. The various street works are estimated at 700,000*l*.

The Société des Monuments Parisiens has voted the preservation of the whole of the old buildings of the old Ecole de Médecine, situated in the Rue de la Bucherie. This building dates from 1474, and a few years ago was purchased by the Municipality. The building is interesting from the fact that it is the only portion remaining of the four buildings which belonged in the XVth and XVIth centuries to the medical faculties; some portions are also interesting architecturally.

We regret to have to record the death of an eminent French architect, M. Corroyer. Some further notice in regard to him will be found under the head of "Obituary" on another page.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN ordinary meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, Regent-street, W., Mr. Aston Webb, R.A., President, in the chair.

A Bequest to the Institute.

Some nominations for election on the 29th inst. having been read, Mr. Locke, Secretary, read a letter from Mr. A. Saxon Snell, acknowledging the receipt of the letter of condolence sent by the Institute to the relatives of the late Mr. H. Saxon Snell. Mr. Snell thanked the Institute for their kind expressions, and added that it was his privilege to say that, under the terms of his father's will, 750*l*. had been bequeathed to the Institute for the institution and maintainence of a special triennial scholarship.

The President said he was sure that every member of the Institute would be grateful to Mr. Snell for the bequest for the encouragement of architecture and the education of young architects. Later on, when particulars of the scheme had been received, they would communicate their thanks to Mr. Snell.

The Royal Gold Medallist.

The President announced that the Council proposed to submit to His Majesty the King, as a fit recipient of the Royal Gold Medal for the promotion of architecture, the name of M. Auguste Choisy, Chief Engineer in the Service des Ponts et Chaussées, Paris.

President's Address to Students.

The President then read the following address to students:—

Brother students, for a second time it falls to my lot to address a few words to you on the occasion of the presentation of the prizes offered through this Institute.

Last year my subject was the importance of work for all intending to follow the art of architecture, and I was told by some that this doctrine was a little hard upon the young men, while, on the other hand, some students were kind enough to write me that they had found what I said encouraging and useful. Still, though I do not believe for a moment that young men are afraid of hard work, I propose to-night to say something on the pleasures in connexion with architecture, for I think there is no work in the world which has more pleasant by-paths and quiet resting-places than the art of architecture. Of course the greatest pleasure of all is the pleasure of your work. If you do not feel this I advise you, as I did last year, to throw up architecture and to take to something else before it is too late. Yet what pleasure can be greater than seeing the realisation of your ideas in brick and stone, even though your steps may be faltering and the result disappointing? If you can say with Tennyson, "Once in a golden hour I cast to earth a seed, Up there came a flower," then those golden hours will be your pleasure in life; few and far between they may be, but never to be forgotten when they come, and their memory will not fade.

Mr. Stopford Brooke, in closing his "Life of Browning," describes him in words which, perhaps, you will allow me to quote, for they apply to an artist in stone as much as to one in words. He says of Browning "No fear, no vanity, no lack of interest, no complaint of the world, no anger at criticism disturbed his soul. No laziness, no feebleness in effort injured his work, no desire for money, no faltering of aspiration, no surrender of art for the sake of fame or filthy lucre, no falseness to his ideal, no base pessimisms, no devotion to the false forms of beauty, no despair of man, no retreat from men into a world of sickly or vain beauty." And then, later on, he describes him as "Creative and therefore joyful, receptive and therefore thoughtful." Then he continues, "Italy was his second country, in every city he had friends—friends, not only among men and women, but friends in every ancient wall, in every forest of pines, in every church and palace and town hall, in every painting that great art had wrought, in every storied market-place, in every great life which had adorned, honoured, and made romantic Italy."

What a vista of pleasures such a life suggests; and I venture to recommend to you young men to take such an ideal as your standard and determine to live as near to it as you may. It all seems very high-flown and impossible, perhaps, at the moment, surrounded as you no doubt are, as we all are, by the petty cares, troubles, and drudgery of everyday life; but it is just because we are so surrounded that we should set your minds on something better, and you will come to find some good even in drudgery, as Carlyle found in the "common journey-work, well done for want of better."

One of the pleasures an architect should cultivate is reading—poetry of all sorts and kinds, romances, plays, and imaginative work generally. If you are to be creative you must also be receptive; you cannot always be giving out unless you are also taking in; and if you cultivate the habit of reading you will be able to get rest and refreshment from it, even at times of the greatest perplexity, anxiety, and even embarrassment. But you must acquire the habit while you are young, and it will enable you in the future to transplant yourself for an hour or two, at will, into an enchanted land, where builders cease from troubling and even your clients (or your desire for them) will be at rest. Another of your pleasures will be the study of painting and sculpture (modern and antique). Alfred Stevens, sculptor, painter, and architect, used to say, "I know but one art"; and if you are wise you will know but one, and train yourself accordingly.

And now, what are the other pleasures of an architect's life that may be indulged in, with advantage to himself and his art? I will name a few, though you already know them well; and in naming them I do not suppose you can entertain them all. Still, you may acquire a nodding acquaintance with many of them; though, if you do, kind friends will probably

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remind you of the proverb, "Jack of all trades, master of none." But there is a much wiser proverb than that, "Know a little of everything, and everything of something." Follow that and you will be a well-equipped man, and that alone will be one of your greatest pleasures in life.

Travel is another of the pleasures that naturally appeal to an architect. You may go round the world or over Europe, or through England, though this costs money, and perhaps that is not a plentiful article with you. Well, then, you have plenty of scope in London alone, which need not cost anything to those who live here. Sir Laurence Alma-Tadema gave a needed hint last year to those about to travel, not to go abroad till they knew something of their own country and their own city. Here in London we have two of the finest Gothic and Renaissance churches in the world, a series of Renaissance parish churches unequalled anywhere, and a wealth of domestic and commercial buildings, ancient and modern, that would take a man's life to know. A friend of mine, an architect, has hardly been out of England all his life, and I verily believe his art is the better for it; yet how few study what is at their doors. "For thus 'twas ever, things within our ken owl-like we blink at, and direct our search to farthest Inde, in quest of novelties."

To enjoy travel properly you must, of course, sketch and draw a little. In my day we used to make water-colour sketches, which had no value as pictures and still less as architectural records; but the making of them was and still is to some of us a distinct and harmless pleasure, not to be overlooked but enjoyed in moderation. The same pleasure can, I think, be got from pencil sketching, with a few of the leading dimensions added, and, though such sketches cannot be *framed*, they will be *useful*, which is far more important. The true value of all sketching is to enable the student to arrive first at the end the artist aimed at, and then to discover the means he employed; apart from this all the pretty draughtsmanship we see is quite thrown away. Still, sketching will always remain, however pursued, one of the recreations of an architect's life. Painting is not for him, except of course a general knowledge of painting and sculpture—enough to enable him to form an opinion of good and bad, and to distingish the works of different masters by their various methods; and no man should think of going to Italy without first mastering to some extent our great collection in Trafalgar-square.

Then there is archæology—a good servant but a bad master. We have allowed it to be our master for close on a century, and in return it has well-nigh strangled all the life out of us, so that we dare not call our style our own. The other day I was asked to write my opinions on what is called "l'Art Nouveau." I was obliged to decline; but had I done so, I should have said that, though no admirer of that particular phase of art expression, I welcome almost any effort to break through the paralysing trammels in which archæology has bound so much of our work. Still, what greater pleasure can there be than to stay in a country village and trace the growth and history of its parish church, to study the Norman beginning, the various extensions from time to time for increased accommodation or display, the Founder's tomb with his geneology and heraldry, perhaps the matrix of a brass and the disfigured font, the occasional floor tile and the oft-deciphered fresco, all making an ideal holiday and an unadulterated pleasure; only, I must add, you had better leave it at that, and not attempt to reproduce what is not reproducable.

Then there are what I may call the somewhat sterner pleasures, such as the study of geology and chemistry. Unless you have had your thoughts directed to these at school you are hardly likely to take them up afterwards; but if you have, you will do well to keep in touch with them. The cliffs and the hills will be of more interest to you for the time, and all life for the other, and the materials with which you build for both.

Music, if you are gifted that way, will give you endless pleasure, if not apparently in very direct connection with your work; yet there may be more relation between the harmonies of sound and the harmonies of proportion than are at present dreamt of in our philosophy.

Another pleasure of a very different kind is that of criticising—not the pleasure of being criticised; that is a chastening ordeal good no doubt for all of us (and one which is never lacking); not the friendly criticism, however severe, among ourselves of each other's work, which is natural, improving, and proper; not the friendly and informing criticism, such as we shall no doubt hear from Mr. Gibson to-night; but the pleasure it gives to some to find fault—to set up for themselves some almost impossible preconceived ideal of perfection, and then to hold up a building to scorn and reproach because it has not reached this ideal. Be as severe a critic as you like of your own work, and never allow yourself to be fully contented with it; but if I were you, I should leave criticism of the other sort as much as possible alone. It is no doubt a duty which some feel bound for the good of their fellow-countrymen to undertake, and useful it no doubt is; but remember what the old Don said to his students: "Everyone may be mistaken sometimes, even the youngest of us." You will find, I think, more real pleasure in the admiration of noble things and fine design than in the criticism of even mean and inferior work.

Perhaps one of the greatest pleasures our work offers to us is the opportunity and pleasure of friendship. Our branch of art is essentially associative. It is conceivable a man may paint a picture or carve a statue in the loneliness of his studio, unassisted by his fellow-man, and, as a fact, many painters take pride that they do this, and that their work is that of their own unaided hands. With us it can never be so, and we must cultivate sociability, and be able to rub shoulders and associate with all members of our craft. A policy of splendid isolation is at least of all suited to an architect amongst artists. You will, if you are wise, be friends with all whom you employ. You will get better work from an intelligent mason by a little friendly chat with him, than with all your stringent clauses in specification and conditions of contract.

Some people seem to think an architect is a sort of detective set over the men to watch them, and would be horrified to see their architect on friendly terms with those they employ; but such people are not those that are best served, or get the best work done in the end. The architect should rather be in the position of the general selecting his lieutenants to assist him in the work, and enjoying the full confidence of his men; they should be proud and pleased to see him on the work, anxious he should see what they are doing, knowing he will praise where praise is due, and blame only where blame is necessary. This may sound to you a little Utopian, but it should not do so. If it is there is something wrong somewhere, and it is for you young men to help to set it right.

Then the pleasure of friendship with your brother-architects is one that may last your life or theirs. Our meetings here, and at the Architectural Association, offer the opportunity of sowing the seed, which can be strengthened in numberless ways. For myself, I have always been a member of one or more small coteries that meet periodically at each others' houses, and they have always been red-letter days to me. In London, personal competition is rarely so keen that the most strenuous life need not be the cause of losing friends. I have heard that the late William Burges used to say, the happiest moment in an architect's life was when he received notice that he had won a competition, and before the troubles and anxieties of carrying it out had come upon him. But I would not myself lay too much stress on this, for there is also from time to time, to the man who competes, the counter-balancing depression caused by the receipt of a communication of a different kind. At the same time, I may be allowed to say that some of my happiest times have been passed in working out large competition problems with my friend Mr. Ingress Bell, and I have found there is real pleasure attending on such work.

And now I have left the greatest pleasure of all to the last, the pleasure we may legitimately feel in going over our completed building, in which we have done our level best, with all the skill which we have been able to bring to bear upon it—no detail ill-considered, no requirement overlooked; perfect it cannot be, but if it is as perfect as we can make it we may legitimately be proud of it and honestly pleased at its completion. What more touching picture than the aged Christopher spending each birthday, after the completion of St. Paul's, under its mighty dome? You may be sure that was one of his greatest pleasures in later life, and one he could not have enjoyed had he not known he had done his best.

And now I have very imperfectly jotted down, amid a variety of occupations and distractions, some of the pleasures that may come into our lives if we will; it is pleasant for a moment to dwell upon them and to leave dull care behind. Such are the things that will help to make us sing at our work and enjoy it, and so make others enjoy it. You and I will not stand here face to face again, as we do to-night, and so I am glad my last words are not of faction, of disputes and controversy, but of the pleasant side of our art.

I am well aware I have said nothing of that all-important matter Design. I have refrained from doing so, because I believe, with William Burges, that this is a direct gift given to each of us in a more or less degree, and there is, therefore, no good in talking any more about it; but, in wishing you all farewell, I also wish you every success in the future. Some of you will, I doubt not, occupy this chair in due course, and be as surprised to find yourself here as I have been; but whatever may be in store for you, determine you will hold high the standard of our art, and keep your shield bright so that you may stand before the world and be not ashamed.

Review of Students' Work.

Mr. Locke, secretary, in the unavoidable absence of Mr. Gibson, then read a review of the works submitted for the prizes and studentships, 1904, which had been prepared by Mr. J. S. Gibson. Speaking of the Essay Prize, for which no work had been submitted this year of sufficient merit to obtain the prize, Mr. Gibson said that repeated attempts had been made of recent years to get a good response for the Essay Medal, and this year eight competitors entered the lists; and it was disappointing to think that not one of those had sufficient grasp of the subject or literary style to obtain the prize, which he was confident would not be withheld by the Council without just cause. Now, the value of expressing oneself clearly in good, terse language, was of great moment to them as architects, and the habit of putting in writing their ideas, desires, and conclusions was certainly one they should cultivate. They need not think that they had to be a Ruskin in their command and mastery of language to obtain this prize; literary style and finish were no doubt essential, but the cultivation of style would in itself be a pleasure and bring its own reward. To those who were ambitious—and surely ambition courses through the veins of youth—there was an incentive in knowing that the name of one of the foremost novelists of our time, Thomas Hardy, will be found on the Institute scroll as prize essayist for the year 1862. In taking leave of this subject, he would say, as one who had had some experience on the Prizes Committee, that they find the greatest difficulty in obtaining subjects for the essay and also for the designs—subjects which should be broad, likely to appeal to a great number, and of value to the whole profession. He was sure the committee would gladly welcome suggestions of subjects for future prizes, and those who had any ideas should send them in at once for the consideration of the committee. But they should remember that anything in the nature of specialisation was to be avoided.

As to the drawings, he proposed to review these in the order of their educational sequence or value, taking first the Measured Drawings, the Pugin Studentship, and the Owen Jones Studentship, as studies of old work upon which architectural knowledge is based; secondly, the Grissell Medal, as design governed by construction; and, lastly, the Tite and Soane Prizes, as designs which show the fruition of the first two groups. He thought that if students entered for these prizes in the order he had named, they would be going through an educational experience which would be of great value to them and likely to lead to beneficial results.

Mr. Gibson then made some critical remarks on some of the drawings submitted. In dealing with the measured drawings, he said that students should remember that T-square and compass-drawing was the most elementary kind of drawing and easily acquired. All students would do well in their full sizes to make it quite clear which was the section side of their mouldings, as several of those submitted would read equally well either side, and he would suggest a flick of the brush occasionally on the inside of the moulding, or a thick and thin section. They might find it very annoying in after life to have, for

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example, their plaster cornices run the reverse way of the moulding because they had not made it absolutely clear which side of their drawing they wanted the mould cut to fit.

Speaking of the Owen Jones Studentship, he said he would especially direct the attention of students to the unwise practice of late years of showing examples of marble and mosaic floors and wall linings of elaborate geometrical patterns, which apparently entailed an enormous amount of purely mechanical drawing to portray, the artistic results of which were so limited in scope and value. The endeavour of the student should be concentrated on getting a grasp of the motive that underlay the decorative scheme of any building, the basis upon which the scheme was founded. A note of the detail of a floor or a frieze which was almost entirely geometrical and mechanical in the repetition of its parts was quite enough if the note be a true one as to colour and form. He would strongly urge students to concentrate their energies on architecture decorated with colour, to portray examples of church roofs, arcades, walls, and domes; they would find the work just as interesting as doing a few scraps of glass or mosaic or tiles, and they would be better equipped to deal with the decoration of their own buildings. They would thus be able to dispense with about one-half of the drawings now sent in, and the Council would be much better able to judge if the winner was likely to benefit from the further study which the Studentship affords.

As to the Grissell Medal, he said that the problem is one in carpentry, and one which had been solved by the old carpenters who worked on our mediæval cathedrals in many beautiful and interesting ways, and he thought as an exercise it should be worked out logically in the same fashion, and not have rolled steel joists and concrete floors introduced into its solution, as was done by some competitors. He did not mean for a moment that they should discard the modern steel joists and other inventions, but rather that an exercise in carpentry should be worked out in carpentry, and one in stone worked out in that material. There were few things more inspiring than the grand old roofs and lanterns of the carpenters who knew the capabilities and value of their splendid material.

Mr. W. Goscombe John, A.R.A., said it was his pleasing duty to propose a vote of thanks to the President for the very delightful address he had given them. He (the speaker) was there as a sculptor guest, and very frequently sculptors found themselves the guests of architects, and still more frequently sculpture was the guest of architecture. The pleasures of architecture were, perhaps, to all lovers of art, the most common; the pleasures of painting and of sculpture were, perhaps, much more limited. Wherever one travelled, however obscure the place might be, however tiny the village, one could always find something of interest in its architecture—in the tiny church, for instance, or the tiny cottage, in which there was generally something to interest one and exercise one's critical or one's archæological faculties. This was not so with sculpture nor with painting, and therefore to artists generally there was no art so vitally interesting as the art of architecture. The President had mentioned William Burges; he (the speaker) had the pleasure of knowing him as a boy, and he received much encouragement and advice from him. Burges was a most inspiring worker.

Mr. W. D. Caröe, in seconding the vote of thanks, said he could not help expressing a note of sadness in hearing from the President that that would be the last address from that chair which he would deliver to students. It had been a great pleasure to him and all of them to see their President in that chair, and it would be a matter of regret to them if their President did not serve for the third year. No happier words could have been spoken than those they had heard as to the pleasure to be derived from the pursuit of architecture. He had often felt that there was no side of architecture which the public knew less about and which, perhaps, was not observed by architects themselves as much as it might be, than the joy which their work gave to architects, and it was a happy inspiration when the President thought of making that the subject of his address. It was not easy to add to that list of pleasures about which they had heard, but there was one, perhaps, —one little one—which was a big joy to him, *i.e.*, the great pleasure there was, not only in seeing one's completed work, but in being actually present on the building, and to see it grow. That was the greatest pleasure that architecture afforded him. There was, as the President said, a great pleasure in seeing their work grow on paper; but he had often wished that the practice of the profession could be altered, and that it should be a self-denying ordinance amongst architects to carry on only one building at a time, and be present all the time of its erection, and watch brick grow-up on brick, and stone on stone; and in that way they would derive a pleasure which few other professions could boast. He thanked the President for his kindly words and charming thoughts.

The vote of thanks having been heartily agreed to,

The President replied on behalf of himself and Mr. Gibson. Mr. Gibson had given them a delightful criticism of the students' works. It was difficult to make those criticisms truly and yet not hurt the feelings of others, but Mr. Gibson had really hit the happy medium. The President then drew attention to Mr. Fulton's Soane Medallion drawings, Mr. Gascoyne's Tite Prize drawings (1902), and Mr. J. H. Gibbons' Pugin drawings, which were on exhibition in the Meeting Room. All these drawings would well repay examination.

Distribution of Prizes and Studentships.

The President then distributed the prizes and studentships. For a full list of the successful competitors, see our issue for January 23, page 78.

The President said that the subject of the paper to be read at the next meeting showed the varied interests of the profession. On February 15 Professor F. Clowes will read a paper on "The Bacteriological Disposal of Sewage."

The meeting then concluded.

THE SAFETY OF THE UFFIZII GALLERIES.

On revisiting the glorious treasures (the world's, not Italy's only) at the Uffizii, I was seized with sudden horror as to the danger existing in these important Galleries from the smallest accident by fire, and of the extreme difficulty in meeting it should the least opportunity be offered for that destructive fiend to gain a hold upon them.

Recent anxieties as to the safety of our own National Gallery from fire have been met by the pulling down of a building which might have threatened, and, in fact, recently being on fire, did threaten and endanger, a collection of works of art which, though called National, is really a part of the world's treasures.

Visitors to any of these world-renowned collections of works of art are carried away with the delights of the show, and can scarcely be expected to take into consideration how they are preserved from the ever-present dangers of modern life, even when seeing open charcoal stoves or braziers in rooms, or noticing water-buckets or hose at hand in case of accident. But once think of it, and, as I said, horror will seize you if you recognise that all these glorious things might pass away for ever in flame and smoke—in a short hour or two—as, alas! many a less likely group of artistic treasures have done.

It is, of course, scarcely necessary to remind you that the Uffizii picture galleries are all on the top floor of a building built by Vasari, 1560-74—not for this present purpose—with wooden roofs and overhanging eaves, 5 ft. to 6 ft. projection at least, characteristic of Florence at the period, supported only on piers, comparatively narrow, of solid work. The openings between these piers are filled in with ranges of wooden window-frames One large range of the Galleries is not far from the opposite one, and they are joined by a gallery with similar ranges, so that, in fact, for a total length of several hundred feet there is no break in the continuity of windows and piers and overhanging wooden roofs and ceilings, only the floors being of incombustible material, and these probably only the surface of marble mosaic.

Thus every facility is offered for fire to run along from end to end, or be carried by a cross wind from side to side.

At one end or corner next the Palazzo Vecchio is the large open staircase, and there is a lift which is generally being used by the public. This, if not sufficiently cut off, is one of the easiest means of carrying fire upwards or distributing smoke.

This lift is needed for many visitors, as the galleries are as many as 126 steps above the ground—showing a height at least as much if not more than the 60 ft. above which height the London Building Act requires fireproof roofs and construction and special means of escape.

It is true the Tribune and other apartments—or *Salas*—are divided by walls from the long corridors and from each other, but the roofs referred to cover all, and many of the roofs have the same kind of wide casement windows at the back as those in the corridor.

It is needless to add that none of these walls pass through the roofs, if indeed they pass the tie beams, or go higher than the ceiling, and so cannot afford any check to the continuity of the roofing.

The stories below these upper galleries are devoted to various purposes, some portions for the store of public archives, some for the public library, and a large portion for the post office, while under the arcades on the ground floor are wooden temporary stalls for the sale of postcards, etc.

The galleries themselves are connected by a bridge with the Palazzo Vecchio, and by the long gallery along the banks of the river and over the Ponte Vecchio with the Pitti Palace. Thus access is afforded for assistance and escape if needed at each end, it must be admitted, as well as danger for the spread of fire. But attached to the buildings—so that the roofs almost adjoin on the Lung Arno—are high residential buildings, warehouses, and workshops, separated in places by narrow lanes, or connected by covered archways, and that danger exists from these is too evident if one looks at the buildings lighted up in the evening in various rooms of many floors at high levels—all very picturesque, but dangerous.

The breakage of a lamp might be sufficient to start a conflagration not easily extinguished in some of these high roofs, and how long it would take to spread depends on the wind at the time, and local fire extinguishing appliances are not very evident.

As to the damage from water used to extinguish the fire—if it were there to be used—I need not remind you.

But I think I have said enough to be dubbed an alarmist by those quiet folk who think it absurd to trouble till the evil is come, and then say it is too late.

Florence. Chas. Forster Hayward.

THE PENROSE MEMORIAL LIBRARY, ATHENS.

We have already drawn attention to the scheme for erecting a memorial to Mr. Penrose at Athens in the shape of a new library and lecture-room in connexion with the British School at Athens. The accompanying plan and sketch show the proposed building, of which Mr. Heaton Comyn is the architect.

The library will form an addition to the existing Macmillan Hostel or students' house, which was built five years ago in the same grounds as the school. Mr. Penrose was the first Director of the British School at Athens, and designed the original school building, which now serves as the Director's house, so it was felt by many of his friends that it would be appropriate to establish a memorial to him in a city with which he was so closely connected for nearly fifty years. As it happens, the school library, which is steadily increasing its number of volumes, is fast outgrowing its present quarters, and, moreover, this room is found to be much too small for open meetings of the school; the committee, therefore, considered the scheme of completing the original plan of the Hostel and building a capacious room, which is to serve the double purpose of a library and room where the school meetings can be held.

The plan shows the general arrangement and necessary alterations that will be carried out. The unshaded part of the plan represents the existing Macmillan Hostel; the walls coloured black are the proposed new buildings. The new library will accommodate more than twice the number of books of the existing room, and two large studies will be gained on the first floor which will be of great advantage to those students who are taking up some special course of study. The exterior has been made to harmonise, as far as the plan will allow, with the existing part, all local materials being employed as much as possible.

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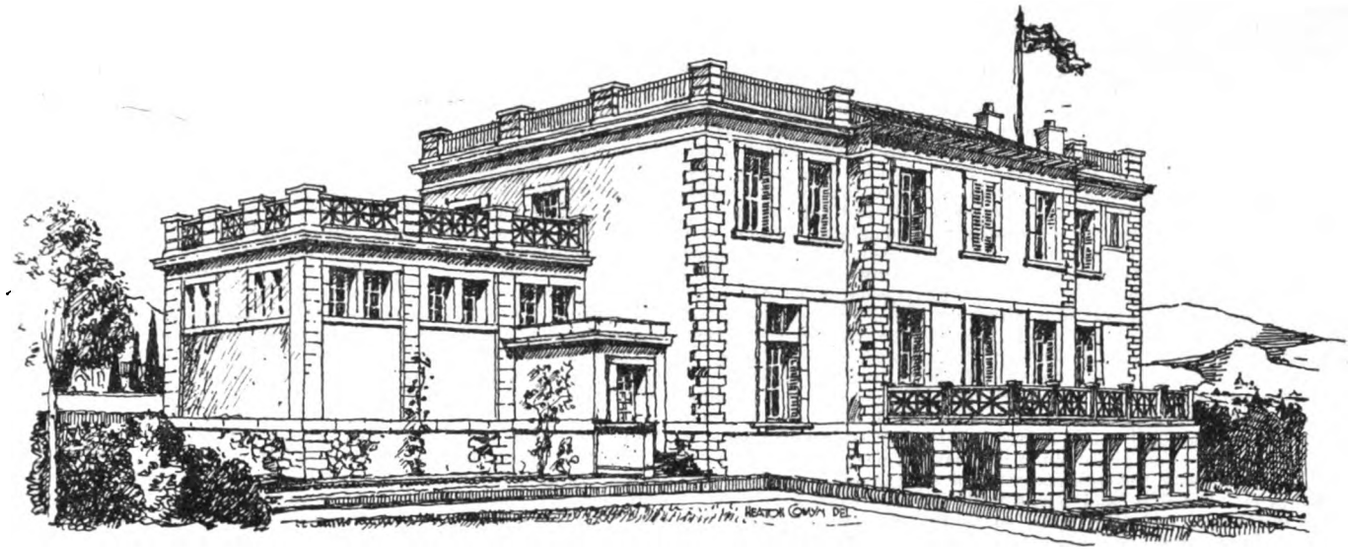


The Proposed Penrose Memorial Library, Athens. Mr. Heaton Comyn, A.R.I.B.A., Architect.

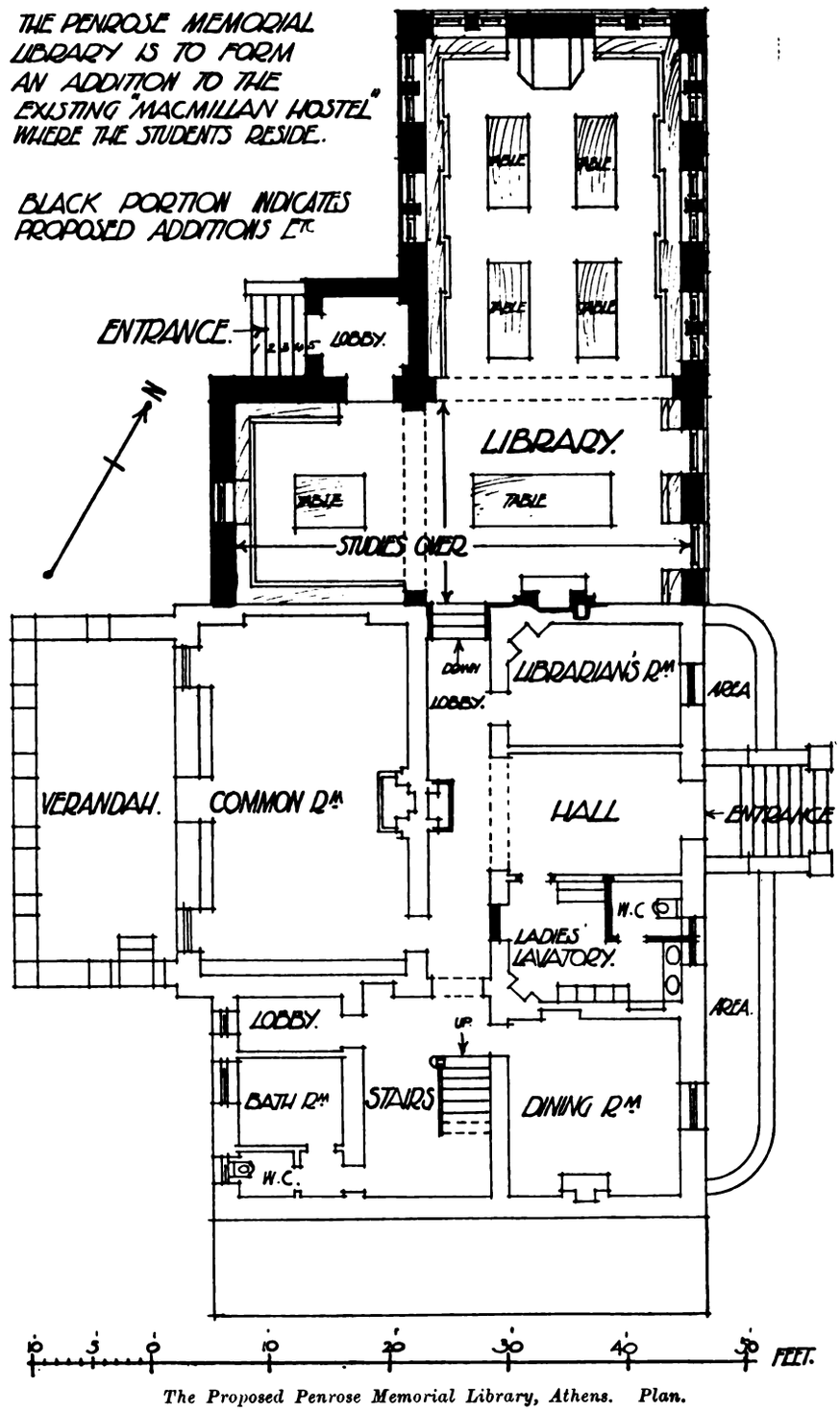
If funds permit, a portrait or bust of Mr. Penrose is to be placed in the library, the estimated cost of which, including fittings and proposed portrait, is about 1,200*l*. This, it should be added, is at Athens prices for building work, which are very low in comparison with English prices.

INVENTION.*

TO UNDERSTAND and appreciate invention aright it is necessary to have a clear view of the world of thought and work in which it takes place. One of the commonest and most fatal errors committed by would-be inventors is to view invention as if it had no past—as though the casual "happy thoughts" of those who are ignorant of what the world has already done merited its title and its rewards. From this source come most of the bitter disappointments that I have so often witnessed in my practice. We must not fall victims to any such delusion. Invention has been busy in the past, and it has left to the inventor of to-day a rich heritage of knowledge, and while he has its help in his onward struggle he has also its responsibility. The growth of mechanical science narrows as well as widens his field. It opens out to him new possibilities it is true, but on the other hand every advance in knowledge takes so much from what, up to that time, belonged to the field of invention. Nor is this only true of to-day. Even if we go a long way back into history we shall still find that the inventor had at his command a formidable armoury of weapons in the shape of mechanical arrangements and combinations which already belonged to the domain of public knowledge. I must ask you to give a little thought to this ground work of knowledge before we pass to the achievements of invention.

These elements of mechanism—approved devices for effecting definite mechanical results—were themselves originally the results of invention, although in many cases the time, the mode and the author of their introduction are all forgotten. By their intrinsic usefulness they have survived the machines in which they were first employed, and are preserved as means for special ends in whatever connexion these ends may be sought. Each represents a past achievement and a present and future power. Mankind claims to be the only tool-using animal, and if we include in the term "tool" the devices used in machinery, we may fairly say that the advance of civilisation is marked and measured by the additions to the tools he has at his command, each enabling him to do some new thing or to do an old thing better. It is in this sense that each gives him a new power. Take, for instance, the ratchet. Who first used it, and in what machine, has long since been forgotten, but from the time that it became known mankind has had the power to obtain free rotation in one direction without the risk of its being reversed. So habituated are we to this device and its effect that it may seem too obvious to be looked upon as an invention

* An address delivered to the Junior Institution of Engineers by the President, Mr. J. Fletcher Moulton K.C., F.R.S., M.P., on January 22.



The Proposed Penrose Memorial Library, Athens. Plan.

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enriching the world. But if you will throw back your mind to those very early days when rotation itself was only used in a few simple machines, I think you will feel as I do that we are no little indebted to the man who first devised the ratchet, and thus put it in the conscious power of every subsequent inventor to produce rotation in one direction only whenever the needs of his invention require it.

I have said that each of these elements of mechanism, the result of some past invention, represents a present and future power conferred on mankind. It is thus that in my own mind I love to regard all worthy inventions.

You remember those fairy tales which you read in your boyhood, where the hero receives some magic gift which endows him with giant strength or lightning speed, or enables him to transport himself to any part of the world by a wish. The tale then proceeds to work out his fortune through the use of this magic power, till it ends in his marriage with the inevitable princess. This in kind, if not in degree, is the history of mankind under the stimulus of a new invention. It thereby becomes possessed of a power hitherto denied it, and busies itself in turning this power to useful ends, so as to achieve by its means some new triumph in production. The strong man of the fairy tale may be no longer found on our work-a-day earth, but the hydraulic press, by rendering well-nigh infinite pressure a thing to command, is no bad representative of him, and if it could be calculated, I am sure that the wealth it has brought to us would make even the riches of fairy realms seem trifling.

It must not be thought that simple devices such as the ratchet are all that I would have you regard as the equipment of the inventor. All elements of past inventions which have a merit beyond the special use first made of them, and which thus possess a more or less general applicability, come under this head. They include many great conceptions which ever since their introduction have been the mainstays of the inventive world, and have exercised a vast influence upon human progress. They have shaped subsequent invention by reason of their own efficiency, just as the development of a country may be permanently modified by the existence of a good line of inter-communication such as a navigable river, which renders trade easy along its course. As the most brilliant example of this I should cite the Jacquard. It first appeared about a century ago as an appendage to a loom, and it still has its most frequent employment in machines for the production of textile fabrics and the like. But this is only because such machines most frequently need its aid by reason of the character of the tasks they have to perform. In its nature it goes far beyond this special use. It puts into the hands of mankind a simple method of dealing with cycles however complicated, of elements however numerous. To realise of what it is capable you should examine a Nottingham lace machine with its thousands of threads, producing each hour lace of some varied and intricate pattern that would otherwise require months of human labour. You will then understand me when I say that the Jacquard is, in my mind, a complete solution of the difficulties produced by multiplicity of elements however fantastic and involved be the maze through which they have to wind. So general, and indeed, so nearly universal is it in its scope in this respect, that I am always reminded by it of those general mathematical expansions, such as Taylor's Theorem, which are able to deal with all functions however complex. Like them its very generality makes us take refuge in it only when no shorter and more special method can be found, but as a final resort it is always at our command, as little puzzled by the compositions of Wagner when it is used in the Pianola as by the flights of the designer's fancy when it is used in a carpet loom.

As another example of these great fundamental elements of mechanism let me take the electric relay. What is it? It is merely an electro-magnet (usually capable of being actuated by a small current and from a considerable distance), whose sole object and function is to create a contact between two pieces of metal, and thus complete an electric circuit. With this circuit the relay and its actuating current need have nothing in common; its function is confined to causing this external circuit to be completed, and the whole further working of the machinery, of whatever nature it may be, is due to the current that flows through the completed circuit from the battery or other source of electrical power with which it is connected. It is like the trigger of a gun. The propulsion of the shot is wholly due to the locally stored-up forces of the powder. The trigger or igniting spark only sets them free to work. So with the relay. This division of function leaves you free to keep your directing mechanism as delicate as you will, however great the forces with which you intend to work. The relay may be so finely balanced that the minutest current is sufficient to actuate it, and yet the energy that pours through the completed circuit may be enormous. Your machine by such means can imitate the human body with its scores of muscles of different strengths, shapes, and functions, each moving in its own way and with its own force at the direction of the delicate nerve currents which proceed from brain and ganglia, which themselves furnish none of the energy used in producing the movements they excite.

I am sure that many of those that I am addressing will have said to themselves that I need not have gone to electricity to illustrate the principle of working by local stores of force. For example, everyone who has seen steam steering gear will realise that this is an equally telling example of the principle. Instead of a dozen men standing at the wheel in a storm, as our boyhood's tales of travel used to describe, the hugest liner is steered by the pilot with equal ease be the weather rough or fine, because the function of the wheel is no longer to move the helm but to set free a steam engine to move it. But I chose the electric relay because it represents in its simplest and most naked form this principle of severing the forces of direction from those of execution. Delicacy and strength are no longer alternatives between which we must choose. We can have the giant's strength without his clumsiness.

There is a further reason why I selected the electric relay as the embodiment of this principle. It is because I wish to impress on you that in equipping himself for his task the inventor must be prepared to take all the aids that science has given him. The days when electricity was a thing apart, having no legitimate place in mechanical work, are gone for ever. No department of practical science illustrates more forcibly my simile of the fairy gifts. Consider for a moment what new powers it has brought—and from what old trammels it has freed us. A mechanician of the olden days coming amongst us now would imagine we possessed a magician's powers. His conceptions of mechanical action must have been well-nigh limited to such as depend on gearing and its analogues with all their limitations. With difficulty and with loss alone could the action of a machine be extended over more than a small space, and all its connexions must have a massiveness proportionate to the forces that actuated it. He now finds that the several parts can be actuated independently and with duly proportioned force, however widely separated in space they may be, that connexions need no longer be themselves capable of any mechanical transference of force, or be rigid or rigidly connected with the machines they actuate. He is even freed from the necessity of contact between the parts of his machine. Action at a distance is at his command through the medium of the electro-magnet, so that one part of his machine may actuate another part without physical contact. He can thus, when he wishes, turn the flank of his persistent and implacable enemy—friction. In an exquisite writing telegraph, which I saw some time ago, an escapement was used in which the anchor never touched the teeth of the escapement wheel, the whole actuation being electro-magnetic, so that the parts when they approached seemed fendered off by invisible hands that they might not collide. And, in the near future, we have the promise of still greater freedom. The Hertzian waves give us control at distances far beyond any mechanical needs, and already many inventors have schemed out how by their aid to direct and set in action torpedoes moving freely in the sea. And although the forces thus transmitted are so minute that they must work through the medium of local stores of force, it is not beyond hope that even this limitation of our powers will be overcome and we shall be able to supply to mechanism both direction and actuating force from a distance by these means.

As an example, how new mechanical elements, bringing with them new powers and new liberty, give rise to new types of machines, take the case of milled cutters. Before they were known various forms of shaping devices, such as plane, gouge, and file existed, and had each its special conditions of application and its effect, but none of them possessed the property of the milled cutter of eating its way (as though it were a mechanical acid) into the material with which it was brought into contact. At once we find springing up universal shaping machines copying forms however irregular merely by having these rapidly revolving milled cutters—like dentist's drills—fixed in frames capable only of motion of translation and not of rotation, so that they all moved in parallel lines, maintaining their relative positions. One such element is a dummy of the same shape and size as the cutters, and it is made to move over the object to be copied, and consequently all the others, being parallel to it and preserving strictly their relative positions, eat out their respective blocks of material to the same shape. I remember first seeing such a machine at work on shaping the clumsy sabots of French peasants. With requisite refinements of mounting and general mechanical arrangement it is now copying with absolute fidelity the most elaborate statuary. Whether the work be rough or fine, the principle is the same. Once you realise that your live cutter will eat out where it touches you have only to make it imitate in its movements the dummy that feels over the whole surface of the object to be copied to insure that it will reproduce that object. But not only the idea but the possibility of such a machine sprang directly from the introduction of the revolving cutter.

I have, perhaps, lingered too long over the equipment of the inventor. Let me now turn to his task. I shall not attempt to include the whole domain of invention in my remarks. It is too varied and too vast. I must limit myself to some one type, and accordingly the class of inventions which I have chosen are those whose object is to produce, by mechanical means, articles that otherwise must be produced by hand work. This, in itself, would be an idle feat if the new method did not effect its purpose better or cheaper or more swiftly than that which it is to supplant, and it is the machine which accomplishes this most thoroughly that will ultimately succeed. It is this necessity of efficiency in the invention which brings it about that before designing his machine the inventor has a preliminary task set before him, on the right performance of which his success mainly depends, and which is calculated to try to the utmost his inventive faculty.

Take any hand operation—say, for instance, sewing. Ages of experience have authoritatively decided the easiest way to perform it, and this solution is found embodied in the practice of to-day, and has probably remained unchanged since the Stone Age. But this solution is the correct one only when we are working with such means as Nature supplies to man. With two hands, whose movements are closely watched by eyes which report to a guiding intelligence, you can find nothing better than to have a needle pointed at one end and pierced with an eye near the other which carries a moderate length of thread from one side of the fabric to the other, and serves as the instrument through which adequate tension is applied to the stitch to make it tight and even. But in passing from the hand to the machine you lose some capabilities and gain others. Direct information of so comprehensive a character as the seeing eye can give to the mind would be as hard to attain in mechanism as it would be to frame the complex orders which flow therefrom through the action of the intelligence and to secure obedience to them. Yet though we must resign ourselves to the loss of much, there are compensations for what we lose. The human being has but two hands, and it is only by long practice that it can attain to the perfectly independent use of them. In machinery we have no limits as to number or independence of action. We can construct a Briareus, each of whose hundred hands will perform its appointed task without interference or distraction from the existence or the working of the others. Skill in the sense of trained judgment may be hard to imitate, but skill in the sense of accuracy of work is at our entire command. Obedience will now be blind and unreasoning, but it will be implicit and untiring. It is not my purpose to balance these advantages and disadvantages and show which scale goes down. My object is to

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point out that, under such changed circumstances, there is no ground for assuming that the mode of performing the operation that has been proved to be the best for hand work will be the most suitable for doing it by mechanism, and the first task of the inventor, therefore, is to decide whether he will adhere to the hand cycle or will rather substitute for it some equivalent cycle producing the same results but better suited to the new conditions—to the strength and weakness of the inanimate.

Let me take an analogy. Doubtless, you have often had to send a message by telegraph to some distant country to which the rate charged per word is high. You write your message as tersely as may be, but even thus its length is formidable. What do you do? You fly to your telegraphic code. It tells you that if you will change the phraseology of your message you can by a single code word represent a whole phrase. You thereupon set to work to recast your message so as to make it capable of being expressed in code words. When you have done so you have not improved it as a message. It is less terse and less naturally expressed. If you were writing and not telegraphing you would prefer to use it in its original form. But as now expressed each of the phrases of which it is composed can be sent over the wires in the form and at the price of a single word, and the cost of the whole is but a fraction of what would have been the cost of your message as originally framed. It has been recast in a form suitable for cheap telegraphing.

Just so the inventor. He has to find a series of operations which in their totality are equivalent to the series of the hand worker. But each of *these* operations in itself need not be such as would in hand labour be suitable or even practicable. It is necessary and sufficient for *him that* they are suited to the new conditions, i.e., that they can be well and easily done by mechanism, and that, taken as a whole, they *produce* the same result as the series which he is paralleling. He is rewriting the series in terms suited to mechanism just as the message was *rewritten* in terms suited for telegraphing. The meaning of the message must remain the same but the terms used to express it are no *longer those* most naturally used in writing or speaking, but are those which can be telegraphed at least cost.

To make my meaning clear let me revert to the familiar operation of sewing. I have described the hand process and pointed out how it is unsuited for mechanical reproduction. How is it to be translated into an equivalent cycle suitable for mechanism? In other words, how is it to be "coded"?

This case is interesting, inasmuch as we have two independent solutions made at different dates and widely different in nature. The earlier invention imitated the hand cycle very closely. The thumb and finger of the right hand in the human being were replaced by pairs of pincers capable of taking hold of the needle and letting it free again, but to avoid having to follow the intricate movements of the human fingers in the operation two pairs of pincers were used, one on each side of the work, which passed the needle backwards and forwards through the fabric one to the other. Following out this idea the needle was pointed at both ends with an eye in the middle, and, as in hand sewing, it carried a moderate length of thread. The pair of pincers which held the threaded needle advanced to the fabric and passed the needle through it to the other, which took it and retreated so as to draw the stitch tight and form the completed stitch. To form the next stitch the work was moved through the proper distance and the same process was gone through, the line of movement of the needle always remaining the same.

There is not much "coding" here. The new cycle imitates the hand-worker so faithfully that it benefits little by the advantages of mechanical action. As in hand work it can only sew with moderate lengths of thread, and must therefore have the needles re-threaded at intervals. Its superiority over hand labour is therefore so slight that it is doubtful whether such a sewing machine could ever have competed with, much less replaced, hand work. But it has one great merit. The needle mechanism is capable of being re-duplicated almost without limit, and the movement of the work which is necessary to make the stitches for one needle will serve equally well for any number of needles working parallel to it. Hence the machine that would have failed as a sewing machine has survived and proved useful as an embroidery machine. The work is stretched between two rows of pincers and moved by the workman according to the stitches of the pattern. Each stitch is repeated by each of the parallel needles, which work side by side at convenient distances, and thus as many copies of the pattern are simultaneously produced as there are needles. Each is a perfect facsimile of all the others, and as each copies faithfully the errors of the workman, this machine is entitled to the proud boast that its productions possess all the defects of hand work—an essential we are told of artistic beauty.

What is the cause of the comparative failure of this attempt at a sewing machine? It is evident that it is due to the retention of the feature of the hand operation by which the needle is passed from one holding mechanism to the other. The inventors of the modern sewing machine, on the other hand, decided to work with a needle fixed in its holder and never leaving it throughout the operation.

It at once followed that the needle and thread must, on the back stroke, return through the same hole through which they had entered the fabric, so that no stitch could be formed unless some obstacle were interposed to the return of the thread. Here the two famous and successful forms of the machine parted company. Both placed the eye at the point of the needle that the stroke might not be needlessly long, but while the lockstitch machine used a second thread to provide the necessary obstacle, the chainstitch machine (by means which I need not describe) availed itself of a loop of the original thread for that purpose. Thus in the lockstitch machine the substituted cycle has become as follows:—

(1) The work is moved under the needle for the new stroke.
(2) The needle (which has an eye at its point through which the thread passes) pierces the fabric carrying with it the thread.
(3) A second thread is passed between the thread and the needle (by means of a shuttle or its equivalent) when the needle is at its lowest position.
(4) The needle returns while a take-up retracts the thread so as to tighten the stitch.

This cycle would, for hand work, be immeasureably more complicated and difficult than ordinary sewing, but it consists of operations mechanically easy of performance in swift and accurately timed sequence, and, as the whole of the thread in use has no longer to be passed from one side of the fabric to the other as each stitch is made, it has brought with it the all-important advantage of our being able to work with a continuous thread. Here, then, is a magnificent example of "coding." It is not to be wondered at that the machines which it has given to the world are in well-nigh universal use, and have profoundly modified both our social and our industrial economy.

You see that I have hardly touched on the actual mechanism to be used for performing the several operations of the coded cycle, and it is not necessary. In such a case as this the invention practically lies in performing the operation of "coding" aright. It is this that explains what you so often see in the history of an invention, viz., that everything appears to come from the adoption of one special element which thereafter forms a part of all machines for that purpose. Thus it is sometimes said that the invention of the sewing machine consisted in putting the eye of a needle at its point. In a very real sense that is the fact. Such a needle indicates and embodies the fundamental changes of the cycle in which the real invention consists, and the adoption of such a form of needle implies the adoption of this new cycle. A similar example of a single element expressing the essentials of the solution of an inventive problem is to be found in knitting machinery. The dexterous guidance by eye and hand of the knitting needles or the crochet-hook, so as to draw the thread through the old loop to form the new one without risk of letting it slip or of fouling the old loop, was hard indeed to imitate mechanically. It was the realisation that we must avoid the difficulty by turning the hook into a needle with a closed eye during that part of the substituted cycle, while it remained an open hook during the rest of the time, that solved the enigma. It is a minor matter whether this is effected by giving it a flexible barb, which is pressed to the shank by external means, or whether it is done automatically. The core of the invention is in the use of such a needle, and this has given to us the machines which now take so large a part in the manufacture of clothing.

It is not only in great inventions bringing into the realm of mechanics processes so important as those to which I have referred that the need of "coding" exists. It figures at the birth of most really successful machines. And there are types in which the whole invention may be said to consist in the choice of a cycle. Take for example the processes of shaping metals by pressure, the rapid development of which has been so characteristic of the last twenty years, and the promise of which is so brilliant for the future. In them the metal is treated as a highly viscous substance, and the aim is to make it assume definite and often complicated shapes through pressure alone. If this is well done the strength of the material itself throughout all its parts is increased. If not, the resulting article is weak and unreliable. The whole success of the process in its application to the more complicated forms depends on the judicious choice of the series of intermediate forms through which the metal is made to pass. You are dealing with substances so resistant that all attempts at sudden or violent transference of material from one conformation to another must result in weakening or rupture. The series must, therefore, be such that each step entails a transference under suitable and advantageous conditions. It must leave the material in the position best suited for the next step, as a good billiard player takes care that the balls shall be left so as to make his next stroke an easy one. To design successfully such a process may involve invention of a high order, even though the execution makes use only of ordinary tools.

When the transformed cycle has been determined upon, there remains the task of providing the means for carrying it out—in other words, the designing the new machine. On this part of the subject I shall not dwell because the devices which human ingenuity makes use of to effect its objects are so multifarious as to defy classification. Nor does the progress of invention come to an end when the machine has been devised. It then becomes the subject of further invention, the aim of which is to arrive at better results by modifying or changing or adding to the mechanism. This is the most common type of invention. Long after a fundamental invention has been made and embodied in some form of mechanism new inventions will appear, which are, or claim to be, better methods of carrying it out in general, or which adapt it to be used with more effect in special circumstances. Such subsidary inventions usually consist in the substituting for the mechanical devices originally used other equivalent devices better suited to the work which they have to perform, the machine in its essentials remaining unchanged. And though this judicious adaptation of means to ends may seem less brilliant and interesting than such inventive efforts as we have been considering, it is hardly less useful. To increase the output of a machine or make a delicate machine equal to rough work is no mean achievement, and may vastly extend or even create its practical usefulness.

It is here that the lawyer's difficulties are greatest. The benefits of the Patent Laws are confined to inventions, and it therefore becomes necessary, in deciding whether a new machine or a modification of an old machine is good subject matter for Letters Patent, to put to oneself the question, "Does it involve Invention?" The decision is not difficult when it involves a new cycle or a wholly new mechanism for accomplishing an old cycle. But when it consists of an improvement on old mechanism by the substitution of different but equivalent devices the task is one of great nicety. It would seem to be necessary to fix upon some definition of invention, but this has never been done, and in my opinion no definition of invention can be found which is of the slightest assistance to anyone in a case of difficulty. It is very much like deciding whether a book belongs to literature. No one would deny it in the case of Ruskin's "Modern Painters," or assert it in the case of "Bradshaw's Guide." These extreme cases are easy of decision, but when you approach the dividing line it is so impossible to get a test that it becomes, more or less, a matter of personal opinion. Some of the elements of a combination are altered so as to improve, but not essentially change, its working. Is that a new invention? If it is only the substitution of mechanical elements

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which are notoriously the equivalents of the old elements the law is clear, but in any other case it is treated as being a question of fact for the judgment of whatever tribunal has the duty of deciding. Our Courts, in this, as in many other questions, lean to the practical rather than the dogmatic. They impose no rigid test such as that to which the German Patent Office inclines, viz., that the new combination must produce a different technical result. To do the same thing better, or in a way so different that it gives to the public a useful choice of means, may with us be sufficient to support the claim to invention. And I have little doubt that if a case should arise in which a judicious selection out of the list of known and notorious mechanical equivalents gave an unforeseen and markedly superior result the Courts would consider themselves free to hold it to be invention, and, in treating the decision as thus dependent on the resulting utility, they would only be following the dictum of Lord Watson: "There are many things which you cannot say are, or are not, inventions till you have tried them."

"Have something to say, say it, and sit down," was the reply given by a Parliamentary veteran to a new member who asked for advice as to how to speak. How often have I wished that inventors would take this counsel to heart in all its fulness. They often have something to say and they say it, but they will not then sit down. It is not that I would have them rest on their oars, but I would have them bear constantly in mind that the value and the reward of an invention comes when it has been made practically serviceable to mankind, and that the invention itself is but the first and perhaps not the most difficult step in the process. Careful and patient development along commercial lines is necessary before an invention, valuable in itself, becomes a useful part of our system of production, and here the enthusiasm and knowledge of the inventor would be invaluable if it were well applied. I am one of those who believe that *cæteris paribus* the mother is the best nurse. But, alas, this is where inventors so often fail. They are never content to work out practically what they have invented. Fresh inventions are their remedy for every difficulty, even for such as naturally occur in all industrial developments, and thus perpetual change leads to delay, loss, and final abandonment. "*Le mieux est l'ennemi du bien.*" ("The better is fatal to the good.") I remember that many years ago I was taken to the workshop of Mr. Babbage, of calculating-machine fame. He was then an old man, with a most remarkable past. A distinguished mathematician when at Cambridge, and a leader among those who rejuvenated its teaching—a man of comfortable fortune and untiring industry—gifted with great inventive powers, and living for them alone, one would have expected in his case to find all the marks of a rich harvest of achievement. In the ante-chamber I recognised parts of the well-known calculating machine that many years before he had brought to the stage of actual working, and I asked him as to its completion. "Oh, I have done no more at that," was his reply. "Before finishing it I conceived the idea of my analytical machine, which was so much better that it would have taken more to complete the first machine than to make the new one." We then came to the analytical machine, parts of which were lying about, and he explained to me its principles and mode of working. "Have you got it finished?" I asked. "No," he said, "for I have come on a new idea which throws it so completely into the shade that it would be mere waste of time to work further on it." And then he explained to me this new idea that was to revolutionise even the world of advanced thought in which he lived. No comment of mine could be so weighty as the plain recital of what occurred when this richly gifted life came to an end. A committee of our ablest mathematicians and mechanicians was appointed to examine the models and papers that Babbage had left behind in order to ascertain whether Government would be justified in completing his work at the public expense. The report was that all was too incomplete—that no one could foresee success with sufficient certainty to warrant the attempt. So that a fragment of a machine, the work of his early years, is all that his abilities and his industry brought forth.

It is not only men of the teeming brain of a Babbage that leave their work in this incomplete and useless state. It is the most common fault of inventors. They have not the patience to develop their inventions to the stage of practical reliability, and they leave them useless except to testify to the ingenuity of the mind that devised them. I suppose that I, of all men, should feel sympathy with these unrewarded workers, but I confess that in my secret heart I consider them an almost unmitigated nuisance. They accomplish nothing useful themselves, and they detract from the merit of those who, by greater perseverance and more patient labour, have succeeded where they failed. Their inventions attain posthumously a short-lived forensic glory by being paraded as anticipations of some later invention that has proved itself of sufficient value to be worth defending. The resemblances are pointed out in order to discount the originality of the successful invention, and oft-times it has to be admitted that the kernel of the later invention is to be found in its predecessor. But I am happy to say that when an inventor is modest in his claims and seeks only to protect that which he has in fact made practically useful, the tendency of the jurisprudence of our country is to pay little heed to antecedent incomplete or useless attempts. I have long contended, and I think it is now settled law in our Courts, than an invention is not made until it has been developed so far that the normal result of its working is success. Uncertainty in result beyond this point means practical uselessness, and as it in fact leaves the field still unoccupied for future inventors, so it should do in law, and their fame and their reward should not be lessened by the useless half-successes that have preceded them.

I shall be told that I am too hard upon the inventor in holding him responsible for commercial non-success. It will be said that the practical development of an invention is not the business of the inventor, and that the qualities of mind that characterise him unsuit him for the task. Unvarying repetition is the key to commercial production, while the inventive genius yearns for change. There is much truth in this, and the strongest and most successful combinations are those in which both elements are represented in different individuals, the more practical being the dominant one. It is in this that we are so far behind our great rivals—Germany and the United States. I am not going to weary you with a description of the laboratories of research which exist in all the great chemical works in Germany. This has been so much dwelt upon of late that I only refer to it in passing as an eminent example of this union of invention with a system of practical development. But what is not so widely known is that in the United States the same thing is done in connexion with mechanical inventions. Men possessing inventive genius of a high order are maintained as part of a business organisation for the express purpose of making inventions which, when made, are duly tested and, if found of practical value, are exploited on a large scale, the inventor reaping thereby his reward. It is by this that I explain the fact that the successful machines of to-day, and more especially those of a complex type, or that form elements of a series, are mainly of American origin. I see no reason to think that we are individually inferior to Americans in inventive faculty, but unquestionably English capital is, as a rule, in less enterprising hands. Our great business firms are inclined to put off taking up new inventions until competition has forced them to do so, and they are still less disposed to look on invention as forming an essential part of business. In saying this I must not be supposed to be applying the criticism to all. Happily there are amongst us most brilliant exceptions, but the tendency of the successful among us is to rest in the old ways while our great rivals are throwing so much of their strength into the discovery of new ones. It is in consequence of this that the development of new inventions in England falls so much into the hands of limited liability companies specially formed for the purpose, and this is far less likely to bring success than if the inventions were developed by existing firms or companies. Joint stock enterprise of the commercial type is so far inferior to individual enterprise that it rarely succeeds, unless it is the embodiment of the individual work of one or two individuals, and in the case of companies specially formed to work inventions it too often happens that the management of the company is in the hands of the inventor himself, who possesses little or none of the commercial training necessary for success. In looking back I can think of no few inventions which, in wise hands, would have produced enormous returns, but which have, for these reasons, produced little or nothing even if they have not been a source of loss.

In what direction is invention trending? In two directions which are well-nigh opposite or, I ought rather to say, complementary the one to the other. On the other hand the tendency is to divide manufacture up into many simple operations, each capable of being performed swiftly and well by a special machine designed solely for that purpose, and thus working under the most favourable circumstances for cheapness of production. Take, for example, the manufacture of machine-made watches—a manufacture which I am happy to say, is at last being vigorously taken up in England, after we have so long allowed ourselves to be distanced by our foreign competitors, both commercially and inventively. Each machine employed has only a minute operation for its share of the work, several being needed to perfect each piece. But these machines are so nearly automatic that the labour required for the most part needs no skill, and the rapidity with which they work makes the actual cost of production almost incredibly small, while the accuracy of the workmanship can be, and is, brought up to a pitch which completely satisfies all requirements of practical use. This tendency to sub-divide the operations of production until they are each capable of being performed either automatically or with unskilled labour, is having momentous effects in labour questions. Strange to say, increase in accuracy of workmanship is tending to increase the demand for unskilled labour. The skill which used to be sought for in the workman is now embodied in the machine. This is due to what I may term the uniformity of mankind. The chief wants of each class are common to all the individuals that form it. Hence any rise in the standard of comfort of a nation produces a demand for millions of articles of one and the same class, precisely such a demand as can be best satisfied by the unvarying but economical production of machines of the type of which I have spoken. I have no doubt that the growth of production as a whole will be so rapid that the total demand for unskilled labour of all sorts in manufactures will not actually diminish, but I am equally sure that, relatively to substantially unskilled labour, it will be less and less used. Rough and brutalising labour will be done away with, but its place will be taken by unskilled rather than skilled labour.

For you must remember that precisely that process of "coding" of which I have spoken is being applied to bring each operation in production within the reach of unskilled labour. Take, for example, machines that are used in domestic or trade life (such as typewriters, sewing machines, etc.), and which are produced in such vast numbers. Inventors are hard at work modifying the construction or configuration of each piece of these machines so as to lessen the cost of its production—to enable it to be made by some cheap process which dispenses with hand work and skilled labour. I have known a company in America, before they sold a single machine, spend two years and 20,000*l.* in modifying the parts and their arrangement till each could be made by stamping or some similarly cheap method at a minimum of cost. And you must not forget that, if wisely done, this relegation to automatic machines and unskilled labour is an advantage, because it brings with it as a consequence absolute interchangeability of parts, which diminishes so vastly the cost of repairs.

Side by side with this tendency towards highly-specialised machines, each doing one small and separate operation, there is the other line of invention, *i.e.*, of machines which combine—I would prefer to use the mathematical term, "integrate"—a whole series of successive operations and turn out a completed article. Here we find perhaps the greatest inventive triumphs of our time. Take, for instance, the linotype. Type-setting, type-founding, and casting blocks of type as in stereotyping, had all been done by hand, and to a great extent mechanically, before the linotype came in. But it united them all in one machine, and enabled an operator, with little greater labour than in working a typewriter, to produce the set-up type cast in lines ready for printing.

It is difficult to say which class of machine is attracting most attention—whether combination or division of operations, synthesis or analysis is taking the lead. If success is completely attained, the machine that combines in itself the whole series must always gain the day. But the penalty for falling short of perfection is

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heavier and the danger greater. Each step brings its own liability to failure, and the failure of a step has more serious and more far-reaching consequences. Yet we have abundant proofs on all sides of us that human ingenuity is equal even to this task. Here again the effects of the systematic pursuit of invention in the United States show themselves most markedly. Few private inventors have, unaided, the means or the time to work out such complex problems. Mergenthaler, the inventor of the linotype, spent years of incessant labour before he came to a practical result. Plan after plan was devised by him only to be rejected, because the success it brought was too incomplete. At last he succeeded, and he and those who had supported him had their rich and deserved reward. This is but one of many instances that could be given. I wish that it were easier to parallel them in this country.

Those whom I am addressing are chiefly in the early stage of their professional career. How do I wish them to regard invention? Should they all aspire to a share in it, or is it to be reserved for a chosen few?

To answer this question I must go back a little and recall to your minds the aim of invention. It is to enable mankind to do some new thing or to do an old thing better or proper or more swiftly. It is accomplished by a more judicious adaptation of means to end. If we cease troubling ourselves about the arbitrary line, which for certain legal purposes is drawn so as to delimit what is invention, we may look on all those who are engaged in improving mechanical appliances and in advancing practically mechanical science as fellow workers in one common field. In this sense you may all hope to be inventors, and it is this conception of your calling that I would impress upon you. Don't seek originality or change for its own sake. Have a single eye for efficiency and be content with the work of others until you can surpass it—remembering always that well-trodden paths are easiest to follow and that it needs some substantial gain to warrant your leaving them. But never lose the hope that you may be able at some time and in some way to help the advance of science by some contribution of your own which may merit in every sense the title of invention.

Is this wise advice? Can one allow oneself to taste the fascinations of invention and not be led astray into fruitless and desultory quests after some new thing? The danger exists only for those who are superficial in their work. The wider and more thorough is a man's knowledge the less likely he is to over-rate his own powers and by thinking himself a universal genius be led to waste his life in futile efforts to do everything. Indeed the danger is rather that he will be too much discouraged. He will find that so much has been done so well by others that he will despair of accomplishing anything new that is worthy to be ranked with it. But a little discouragement will not hurt him so long as it does not lead him to abandon the training that is to prepare him for the moment when he finds his right task.

And here let me put in a word as to this training. I am not going to enter upon the vexed question of Technical Education. I am going to remind you of the metaphor I used when I compared invention in a machine to literary merit in a book. I want you to look upon famous inventions as a scholar looks on the works of our great authors. He reads them not only to enrich his vocabulary but to teach himself consciously how those words can best be used. You cannot read an essay on Macaulay without learning something more of the powers of our language. So is it with the machines of the great inventors. They are your literature. You cannot master their construction without getting a firmer hold of the resources of mechanical science. My advice to you is study your machines. Never miss an opportunity of examining those whose merit is established and which have played a great part in the world of industry, even though they may not belong to your special branch. Try to appreciate the task their makers had set before them and the steps by which they performed it. I shall never forget the occasion when the late Professor Hughes explained to me his Printing Telegraph, and narrated how he spent two years in seeking for a vibrator that would answer the demands he must make upon it in speed and regularity, and how his wife's knitting needles at last suggested the solution. On this basis he built up an instrument every detail of which was so well thought out that its complexity and delicacy made it more and not less suitable for the strain of daily use. I wish I had time to take as example this or some other glory of practical science and show you how the great inventors overcame or evaded difficulties; how they at times persevered almost to obstinacy, and at other times threw away all the results of years of labour because they saw success attainable in another direction. But you will find out all these things for yourselves if you will but study great inventions, and, while the study makes you feel humble before those who have done such marvels, it will leave you all the more eager to emulate their achievements.

And remember the future is in the hands of the inventors. No invention can live that does not cheapen production—*i.e.*, that does not lessen the amount of human labour needed to produce a given result. Hence the ratio—if I may use such a phrase—between labour and its results is ever increasing with the progress of invention; indeed, if we take the word in its broad sense, we may rightly say that this ratio is fixed by invention. This ratio, which represents the fertility of labour, measures the wealth-producing power of the world. It defines the amount that the individual can contribute to the common store by his own labour, and conversely it limits the share which he may hope to receive from that store. You will think me too optimistic in putting the proposition in this its converse form. We know that too often what a man receives differs widely from what he contributes by his labour. Creation of wealth does not necessarily bring with it distribution. But in this respect invention is on the side of the masses. Production is aided by it only on terms of the uniformity of the article produced. Hence the characteristic effect of invention is to bring within the reach of the many that which previously belonged only to the few. Lace that princes alone could have possessed comes within the means of the moderately rich. Stuffs that only the wealthy could have procured are worn by those who have to earn their daily bread. Thus products of manufacture under the influence of invention become accessible to an ever wider and wider class. It has responded to the demands for a higher standard of comfort, and it stands ready to respond to whatever such calls are made on it in the future. If it has not done more it is because mankind has been too easily satisfied with lower pleasures, but with the growth of education and the spread of civilising influences of all kinds we trust that this will be so no longer. And I can wish no better future for those whom I am addressing than that they may be sharers in those triumphs which future still holds in reserve for invention.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Lord Monkswell, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Deptford Borough Council 10,000*l.* for erection of town hall; Guardians of Greenwich Union, 21,700*l.* for poor law purposes; Hackney Borough Council, 7,406*l.* for electric light installation, and 1,560*l.* for paving, etc.; Paddington Borough Council, 5,219*l.* and 2,566*l.* for payment under Boroughs of Paddington and Chelsea (Adjustment) Scheme, 1903; and Stepney Borough Council, 1,998*l.* for street lighting purposes. Sanction was also given to Paddington Borough Council to borrowing 5,334*l.* for street lighting purposes.

The Works Committee.—The adjourned report of the Works Committee, giving a statement of the works completed during the half-year ended September 30, 1903, was then considered. The Committee reported as follows:—

In Statement I. are included the accounts for 20 works completed in the half-year in respect of which specifications and bills of quantities have been prepared. On a few of these works some small expenditure has been incurred after 30th September last, but all such expenditure has, of course, been brought into account. The extension of the Westminster gas meter testing-office, the accepted estimate for which was 7,000*l.*, was completed during the half-year, but, as the cost account of this work is amalgamated with that of certain repairs at that office, we are unable to include this work in the statement now submitted, and it will, therefore, appear in a future statement. The total cost of the works included in the statements does not represent the turnover of the department, because much of the expenditure on these works occurred previous to the half-year in question, while, on the other hand, much of the expenditure during the six months was upon works which are still unfinished. The approximate expenditure on works executed by the department during the half-year was 187,000*l.* We are glad to be in a position to state that the net result of execution of the works included in the statement is a balance of cost below final certificate of 25,853*l.* 9s. 5d., or about 11·114 per cent. on the total of the final certificates, and that 19 out of the 20 works have been carried out at a cost below final certificate. We are, moreover, of opinion that, in the case of works Nos. 4 [Rotherhithe Fire Station] and 6, [Mile-end Fire Station] the balance of cost below final certificate would have been greater but for circumstances quite beyond our control. . . .

In the case of the erection of Rotherhithe fire substation (No. 4) we accepted the work on condition that free use of the river frontage and wharf would be accorded to the Works department, but, owing to delay in the completion of the execution of the gridiron in front of the wharf, it was not available for use by the department during two-thirds of the contract period, and the heavy materials had consequently to be carted on to the site. This, in itself a considerable item, was rendered more costly through the peculiar character of the site, which is practically insular at high water, owing to the position of the entrances to the Surrey Commercial Docks. The erection of the sub-station was, however, completed within the time stipulated by the architect. In the case of the enlargement of Mile-end fire station (No. 6) work was delayed under orders from the architect, owing to questions of right-of-way and party walls, and about two months' delay was thus caused. The Council will readily understand that any delays of this nature have a far-reaching effect upon the cost of the work, and are very difficult to appraise in the settlement of the accounts, and nothing has been credited under this head in the final certificate. The erection of Lots-road pumping-station (No. 17) has been in hand since April, 1901, and, as it was practically complete some time ago, we have included the account for the work in the statements now presented, an addendum account being opened for the few minor works remaining to be done. For some months past the expenditure has been mainly confined to labour in attendance upon the contractors for the pumping machinery, and until this is in complete working order some small weekly expenditure will be incurred, the value of which will be certified for separately by the engineer, and the account for which will be included in a future statement. The figures now presented are therefore comparable. . . .

The number of works in respect of which full specifications, bills of quantities, etc., have been prepared, and which have been referred to us for execution and not yet included in the half-yearly statements of completed works submitted to the Council, is 36, representing an estimated expenditure of approximately 941,000*l.* As required by the standing order, we have to report that, in the case of the construction of the relief sewer from the southern high level sewer extension at Balham High-road, the sum of 5,940*l.* voted for the work may be exceeded, but this is the only work on which, at present, an excess is anticipated by us. . . .

Mr. Torrance, Chairman of the Works Committee, said the report was highly satisfactory. He was still in favour of the Council doing a considerable part of its own work, although he had nothing to say against the contractors as contractors. The Council had to get the best work, and he challenged anyone to say that the work of the Department was not as good in every respect as that of contractors. The continuance of the Department was in the best interests of the Council.

Mr. E. Collins said that the Department was insolvent. If the Council had faith in the Department, why did they not make it tender with the contractors? There were no assets to pay for the 80,000*l.* of loss which had been incurred. As an instance of the way the Department carried on its work, he might mention that they were charged 117s. for best wire-cut bricks, and he had a quotation for the same thing for 56s.

Mr. Beachcroft congratulated Mr. Torrance on his satisfactory report. The Moderate Party were not blinded by prejudice, and the Council was to be congratulated on the report. Mr. Torrance did not pitch his success too high, and tell them that all the loss had been wiped off, but only that 25,000*l.* had been saved to set-off against the loss. The result showed that a thoroughly sound business man was required to be at the head of an undertaking of this kind if they were to succeed.

Mr. Howell J. Williams said that Mr. Collins had misunderstood the facts as to the bricks. The price quoted was for bricks delivered at Willesden Junction, and the account charged by the Department was for bricks delivered at various small jobs, in small quantities, in various parts of London.

Mr. H. P. Harris said he did not dispute that the present arrangement was working well, but they must not forget that there had been three periods in the history of the Department, and that the first two had been failures.

Mr. McKinnon Wood said he agreed with the last speaker; but he must remark that the first two phases were forced on them by the Moderate Party, and it was not until the Progressive Party had their way that the Department had become a success.

The report was then adopted.

Drury Lane Theatre.—The Theatres and Music Halls Committee submitted their report in reference to Drury Lane Theatre, part of which we printed in our last issue. The Committee recommended:—

That a notice under the 45th section of the Metropolitan Board of Works (Various Powers) Act, 1882, containing the following requirements, and specifying 28 days as

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the time within which they are to be complied with, be prepared by the solicitor; that it be sealed in duplicate, and be served upon the person or persons by whom the premises, known as Drury Lane Theatre, are kept open for public entertainments—

(*a*) That all doors and gates affording means of exit from the said premises shall be thrown open at the conclusion of each performance, and shall be kept open during the departure of the public from the premises.

(*b*) That all such doors and gates shall be fastened during the time they are authorised to be closed by automatic bolts only of a pattern or patterns which shall have been approved for the said doors or gates by the Council.

(*c*) That such doors and gates may be closed during the times fixed for the admission of the public to, or the presence of the public in, the said premises, on condition that there shall not then be upon any such door or gate any fastening other than an automatic bolt, in proper working order, of the pattern approved by the Council for such door or gate, and on condition that on every occasion when the said premises are open for the admission of the public each of such doors or gates shall, immediately prior to the admission of the public thereto, be fully opened and closed again for the purpose of ascertaining that the same is in proper working order.

(*d*) That all exit and other doors used by the public shall be indicated by painted notices in 7-inch letters, such notices to be painted on the doors and walls, at least 6 ft. 9 ins. above the floor, and that such notices shall not at any time during the time fixed for the admission of the public to, or the presence of the public in, or the departure of the public from, the said premises be in any manner, or in any degree whatsoever, obscured or hidden from the view of the public.

Sir Algernon West, in moving the adoption of the report, said there were two theatres in London which were not under the general jurisdiction of the Council—having been in existence at the time of the Restoration—namely, Covent Garden and Drury Lane. The directors of the former had moved with the times, and had at vast expense done everything which the Council considered necessary for the public safety. With regard to Drury Lane, he suggested that the letters which had passed between the directors and the Theatres Committee should be put in the agenda paper next week, and he thought it would save time if he stated at once that in their last letter the directors had come to the conclusion that they would do all the Council required them to do, or they would submit to arbitration. The Theatres Committee would be quite willing to submit anything to the arbitration of an arbitrator nominated by the Office of Works. If the directors would do that, the Committee had nothing more to say, and it would obviate a great deal of useless discussion. If the directors agreed to carry out all the Committee's requirements there would, of course, be no need for arbitration.

Colonel Probyn said the directors of the Drury Lane Theatre were equally as anxious as the London County Council to have their theatre in a perfectly satisfactory condition. For his own satisfaction he took a note of the time it took to clear the audience out of the auditorium recently, and he found it was 1¾ minutes, whilst the fire-curtain was lowered in ten seconds. The public were also entitled to know that for twenty years past the theatre had been in telephonic communication with the Holborn fire station.

Colonel Rotton disagreed with the idea of an arbitration, and considered it would be fatal to the confidence which the people of London had in the Council.

Mr. Howell Williams also deprecated the Council allowing an arbitrator to come between the Committee and their work.

Mr. Burns, M.P., said they wanted the Drury Lane directors to defer to recognised authority and carry out precautions based on the experience and scientific knowledge of the architect and the Chief of the Fire Brigade. Unless that was done the public would have no confidence in Drury Lane. He thought Parliamentary powers should be obtained to place the theatre on the same footing as other theatres.

The report was then agreed to.

Theatre Fire Lessons.—Mr. E. Smith, Chairman of the Fire Brigade Committee, asked the Chairman of the Committee the following questions—(1) Will you see that no temporary erections or obstructions are allowed in any passages or paths, but that free egress and ingress must be given, and that no standing or sitting is allowed on intersecting gangways? (2) Will you see that a notice is painted on all emergency and other exits, giving directions as to the use of such exits? (3) What steps the Committee propose to take in connexion with churches, chapels, and halls, not licensed, but in which meetings and exhibitions and lectures are given? (4) What provisions are made to secure safety to people attending bazaars, public halls, and other places temporarily licensed?

Dr. Fletcher Little asked the Chairman whether he possessed any means of dealing with churches and chapels which were often dangerously overcrowded.

Sir Algernon West, Chairman of the Committee, said that frequent examinations of inspection were made of all theatres and music halls, and where necessary and possible the Council's requirements were enforced. Notice was painted on all emergency doors and exits. Churches and chapels did not come under the purview of the Theatres Committee; that was a matter for the Building Act Committee, and it was a very serious point. As to temporary licences, they were only granted by the Council for the purpose of stage plays, and in such cases the premises were always inspected by the Council's officers, who advised what should be done to secure the safety of the audience. As to the fatal fire at Chicago, he said that although no official report had yet been received, the danger seemed to have arisen from the theatre being opened without the proper authority having been given as to its fitness. That could not possibly occur in this country. The Theatres Committee of the London County Council never allowed a theatre to be opened until it was satisfied as to the place's safety by thorough examination by the architect and other officials. The exits which existed in Chicago would never be permitted in London, for some of those exits opened on to balconies from which there were no exits. The fire curtain was of asbestos, of a very friable character, and quite unfit for the purpose for which it was required. In London theatres the fire curtains were made of riveted steel, and in addition to that, in all new theatres there were skylights with automatic openings to draw the smoke up. The site regulations in London provided for half of the boundaries of theatres being open thoroughfares, one of which should be 40 ft. and the other not less than 20 ft. wide. The floors and tiers were now made fire-resisting, the number of exits were increased, as well as the gangways, and were provided for those behind as well as for those in front of the stage. In these days of greatly increasing knowledge in mechanical appliances there could be no finality, and at the Alhambra the Theatres Committee, in conjunction with the Lord Chamberlain, had recently witnessed gauzes, cotton-wool, silk, and scenery subjected to the fiercest flames and coming out of the ordeal without a blemish. Since then the Committee had issued a circular to all theatres asking them to have their scenery, etc., treated by the same fireproofing process, which was cheap and safe. He was glad to say that the replies which were being received from the lessees were entirely satisfactory. They must also insist upon telephonic communication being established between the theatres and the nearest fire station, and he thought they should also insist upon all exits being thrown open at the conclusion of every performance. When he mentioned that 400,000 people nightly visited places of amusement in London it would be realised how great was the task cast upon the Committee in seeing that proper regulations were laid down for public safety. The Council and the managers were undoubtedly responsible for seeing that those regulations were given effect to, but in regard to panic the British public were alone responsible. He believed, however, that as the public got to know with what care the regulations were carried out the less would be the fear or possibility of panic.

Central School of Arts and Crafts and London Day Training College.—The Technical Education Board reported that on May 21, 1901, the Council appropriated, under the provisions of the Technical Instruction Acts, for the purpose of the Central School of Arts and Crafts, a site having frontages in Southampton-row and Orange-street at the junction of Orange-street and Theobald's-road, the estimated value, viz., 45,000*l.*, to be refunded to the Council by the Technical Education Board by annual payments extending over sixty years. On July 21, 1903, the Council resolved to retain the site occupying the remaining frontage in Southampton-row up to the corner of the extension of Fisher-street, and appropriated if for the purposes of technical education within the provisions of the Technical Instruction Acts for the London Day Training College, the estimated value, viz., 30,200*l.*, being refunded to the Council by the Technical Education Board by annual payments extending over sixty years. Sketch plans and elevations for the two buildings viz., the Central School of Arts and Crafts and the London Day Training College—have been prepared by the superintending architect. The architect's approximate estimate of the cost of the buildings, including the expenditure upon the plans, quantities, clerk of the works, and all other incidentals, is under 120,000*l.* The Committee further stated that:—

"In the ordinary course working drawings and specifications would have been prepared, quantities taken out, and an accurate estimate of the cost made by the Council's quantity surveyors before bringing the question of the buildings again before the Council, the cost of the same being defrayed out of the moneys entrusted to us by the council; but, as the cost of preparing the working drawings for so large a building and of taking out and lithographing the quantities is a considerable item, we have thought it desirable to secure the Council's approval of the architect's sketch plans, and in particular of the character of the elevation, before incurring further expense. If the Council approve the sketches submitted it is expected that the working drawings, specification, and quantities will have been completed and that the Board will be in a position to commence building operations in September, and the buildings will be completed and ready for occupation at the beginning of the school year 1906-7. In order to meet the requirements of the superintending architect with regard to the façade in Southampton Row, we proposed that the front shall consist entirely of Portland stone except to the height of the first floor, where a granite facing will be employed. We also desire to point out that by erecting the two buildings side by side and by providing means of communication between them on at least two floors considerable economy will be effected in connexion with working expenses, and more particularly as the Training College will be mainly utilised during the daytime, and the Central School of Arts and Crafts in the evening. It will thus be possible to make one lecture theatre serve the purpose of both institutions, to employ one caretaker, to provide one refreshment department and one system of heating and lighting, and to allow a certain amount of circulation between the two schools so as to permit of the common use of art studios, laboratories, and examination halls. . . We therefore recommend—That the architect's sketch plans for the erection of the Central School of Arts and Crafts and the London Day Training College on the site in Southampton row appropriated by the Council for the purpose be approved."

The recommendation was agreed to.

District Surveyor for Hammersmith.—The Building Act Committee reported that Mr. T. E. Knightly has resigned as from June 30, 1904, his appointment as District Surveyor for the district of Hammersmith.

Housing.—The Housing of the Working Classes Committee recommended, and it was agreed, that, subject to the necessary consents under the London Building Acts being subsequently obtained, the plans submitted by the Council of the Metropolitan Borough of St. Pancras, of a block of dwellings proposed to be erected on the Brantome-place area in pursuance of the St. Pancras (Brantome-place and Prospect-terrace) Order, 1901, under Part II. of the Housing of the Working Classes Act, 1890, be approved.

Port of London.—It was recommended by the Parliamentary Committee that approval be given to their opposition to the London Port and Docks Bill and the London and India Docks Company Bill.

Mr. Sidney Low hoped the Committee would not be unbending in their opposition to the Bill of the Government, although some amendments in that Bill would be necessary. The whole trade and commerce of London were dependent on the proper management of the Port of London, and if the Council did not support the Bill nothing whatever would be done.

Mr. McKinnon Wood believed the Council appreciated the importance of the matter, and was anxious to have the Docks and Port placed under the control of a public authority.

The recommendations were adopted.

Electric Tramways in North London.—On the reception of the Highways Committee Report, which dealt at some length with the difficulties of electrifying the tramways on the north side of the Thames, Mr. Beachcroft said that the underlying idea of the report appeared to be to throw the blame for delay on the North Metropolitan Tramways Company, but, as a matter of fact, under the lease the Council could come in at any time and electrify the lines.

Mr. Benn said the company was entitled to quiet enjoyment, and it was almost impossible to carry out the work unless they co-operated. At present, if they attempted to lay down the conduit system, it would be in the face of the company.

The Council adjourned at half-past six.

ADDITIONS TO BAPTIST CHAPEL, COMBE MARTIN, DEVON.—Memorial-stones of a new vestry and class-rooms in connexion with the Baptist Chapel, Combe Martin, were recently laid. The building has been erected from the designs of Mr. F. Creek, architect, by Messrs. Baker and Darch, builders.

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APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parenthesis :—

Lines of Frontage and Projections.

Dulwich.—A building upon a site abutting upon the south side of East Dulwich-road, east side of Oakhurst-grove, and north side of Solway-road, Dulwich (Mr. A. Keen for Mr. H. Line).—Consent.

Islington, West.—A projecting wooden sign in front of Nos. 36, 38, and 40, York-road, Islington (Mr. S. Jones for Messrs. W. B. Fordham and Sons, Ltd.).—Refused.

City.—A stone hood over the entrance to No. 1, Old Broad-street, City, and projecting over the public way (Mr. H. C. Clarke for the Indemnity Mutual Marine Assurance Company, Ltd.).—Refused.

Lines of Frontage and Width of Way.

Hammersmith.—A three-story building, and three one-story shops at Nos. 331, 333, and 335, King-street, Hammersmith (Mr. G. Trotman for Dr. E. Cullinan).—Consent.

Width of Way, Line of Frontage, and Construction.

Southwark, West.—A luffing crane and platform on the north side of Bankside and of a gangway across that street to connect such structures with No. 6, Bankside (Mr. W. J. Perkins for Messrs. Harrison and Crosfield).—Consent.

Formation of Streets.

Lewisham.—That an order be issued to Mr. J. W. Webb sanctioning the formation or laying out of new streets for carriage traffic to lead out of the east side of Bexhill-road to Ravensbourne-park, and also new streets for carriage traffic to lead from Codrington-hill to Stillness-road, Lewisham.—Agreed.

Space at Rear.

Holborn.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of an addition to Taverner's Temperance Hotel, Hunter-street, Holborn, to abut upon Compton-street (Mr. R. H. Hill for Mrs. A. Taverner).—Consent.

Hampstead.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a van and roller house and workshops at the Hampstead Borough Council's store yard and depôt, Lymington-road, Hampstead (Mr. O. E. Winter).—Consent.

Chelsea.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of buildings on a site abutting upon the north-west side of Basil-street and east side of New-street, Chelsea, with open spaces about such buildings (Mr. R. Bennett).—Refused.

Means of Escape at Top of High Buildings.

Hoxton.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, from the topmost stories of Nos. 2 to 12, Wilson-street, and Nos. 2 and 3, Eldon-street, Finsbury (Mr. G. Sherrin for Mrs. A. Sadgrove).—Refused.

Buildings for Supply of Electricity.

Westminster.—Permission to retain for a further period the temporary iron chimney shaft at the electricity generating station, Millbank-street, Westminster (Mr. C. S. Peach).—Consent.

Dwelling-houses on Low-lying Land.

Camberwell.—Two cottages with stables at rear on low-lying land, situated between Wyndham-road and Beckett-street, Camberwell (Mr. H. W. Rising for Mr. R. Pettifor).—Consent.

SHADWELL MARKET AREA.—The Billingsgate and Leadenhall Markets Committee of the Corporation have framed a scheme for widening High-street, Shadwell, from an average of about 26 ft. to 50 ft., and erecting working-class dwellings, with shops on the ground floors, and for the closing, or partial closing, of several small streets which intersect the sites now vacant or occupied by dilapidated tenements in the main thoroughfare, the necessary paving works to be undertaken by the Stepney Borough Council, and the shops and dwellings to be built as a private venture. Their concurrent project relates to the development of the Corporation's market at Shadwell primarily for sale of fish, and as a supplement to the market at Billingsgate. The market, upon which 140,000*l.* has already been expended, was acquired under an Act of Parliament by the Corporation nearly two years ago.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION:

THE VENTILATION OF CHEMICAL LABORATORIES.

THE seventh meeting of the Association Discussion Section for the present session was held on January 27, when Mr. T. H. Russell, M.A., read a paper on the "Ventilation of Chemical Laboratories," illustrated by diagrams, models, and demonstrations, which added greatly to its value.

Mr. Russell, after remarking that it would be unnecessary that he should dwell upon the great need of efficient ventilation in all chemical laboratories, dealt with the subject naturally under two heads, namely (1) general ventilation, or the process of replacing air rendered impure by respiration and combustion with fresh air; and (2) local or special ventilation for removing all fumes and noxious vapours emanating from chemical processes which, if allowed to diffuse into the room, would quickly vitiate the atmosphere. In natural ventilation, in which the movements of the air within a building are chiefly due to the difference in weight of equal volumes of air, too much importance was usually given to the aspiratory power of the wind passing over the roof, and that for chemical laboratories a stronger, more certain, and regular system is required than natural means can supply. The various methods of providing artificial ventilation were then dealt with. Ventilating radiators were an excellent means of supplying a current of warm fresh air into a room, but they had the disadvantage of being liable to become useless and their action reversed by the aspiratory power of the wind outside. Open fireplaces, although insuring the extraction of a certain amount of air from an ordinary room, were not satisfactory for a chemical laboratory on account of the constant attention required, and the dirt they give rise to where coal is the fuel; while gas fires are extravagant and the fumes may be troublesome. In many chemical laboratories the ventilation is effected by the simple and inexpensive method of heating the ventilating flues either by the introduction of a gas burner or by utilising the heat from furnaces or other sources to abstract the impure air. The former method is advantageous on account of the small space occupied by the apparatus required when used for the special ventilation of draught closets, etc., while the "plenum" system of ventilation possesses the important advantage of increasing the efficiency of the local ventilation by insuring that the internal pressure is always slightly in excess of that of the external atmosphere.

In dealing with the second head, of local or special ventilation, Mr. Russell said that he thought the most efficacious method was the employment of enclosed centrifrugal fans—either aspiratory or respiratory, but that precautions must be taken to preserve the fan from the corrosive effect of the fumes, either by constructing it of some material which will not be affected—such as tinned copper—or by protecting it with special paint. Care must also be taken to see that the fan is powerful enough for the work, that the ducts are correctly proportioned in cross section, the main pipe duly increased after each junction with a branch pipe, and the internal friction of the flues reduced as much as possible.

The principal appliances for special ventilation were described: draught closets and hoods over combustion benches; draught hoods or small closets at intervals on the benches, intended to immediately carry away the fumes; and it was pointed out how draught closets should, where possible, be placed against the walls in order to facilitate the planning of the extract flues directly and inconspicuously; in all cases the flues required to be planned and executed with care in order to insure an equal draught at every point. With a central system of ventilation where each draught closet has a separate flue the danger of some of the flues acting as inlets must be guarded against. Among the draught closets described was one invented by Professor Woodbridge, of Boston, the main principle of which consists in the introduction of a baffling board in the closet, fixed at the top, but sloped up from back to front, leaving at the front a long narrow vent slot.

The paper was concluded by a reference to the necessity of providing local as well as general ventilation in the lecture room, as apart from the laboratory, for the use of the lecturer, and to the advisability of placing a large draught closet accessible from both the lecture room and the preparation room when practicable, and to the two or more down-draught flues fitted into the lecturer's table for his use.

Mr. A. E. Munby, in opening the discussion, after referring to the useful book on laboratory fittings which Mr. Russell had recently written, agreed that many important laboratories were very badly ventilated, and in speaking of fans, mentioned that the "Sirocco" fan had been brought to his notice, and was undoubtedly remarkably efficient. He pointed to the use which might be made of the furnace of a hot-water system in the way of assisting the ventilation scheme, and gave some interesting data which he had worked out in this connexion, observing that makers of heating stoves might well pay attention to the design of airtight ones. Such furnaces, he estimated, would suck in air at a velocity of about 3 ft. per second, which gave a basis for calculating the size of the ducts. He also gave some formulæ—worked out for him by a mathematician—dealing with the allowances to be made in exhaust power in overcoming inertia, passing bends, and loss by friction in air ducts.

Mr. Kenneth Gray, who had come as a visitor, thought that it was remarkable that in England, where a great deal of attention had been given to the sanitary question, there was no educational centre where the science of heating and ventilating was taught as a special subject, whereas, in America, and in nearly all the countries of Europe, it was considered an important part of the civil engineer's training, and was taught at the Universities. It was due to this that so much difference of opinion existed here as to the best means of heating and ventilating; for, having very little definite knowledge, individual speculation was apt to take the place of more definite principles. With regard to the position of outlets, it was generally considered that exhaled air rose immediately to the ceiling; this was open to doubt. A close investigation of the facts seemed to show that as long as the aspired air remained at the higher temperature it would tend to rise, but on cooling it would fall; therefore in extracting near the floor level a very complete change of the air was secured. As to ventilating radiators, a rather remarkable fact was that greater efficiency was attained when the air inlet was open and with cold air passing in through the radiator than when the inlets were closed against the cold air. There were several very efficient fans in the market; but, as a rule, a fan that worked silently could not be doing much work, the silence being generally obtained at the expense of velocity, and the greater the velocity the higher the efficiency With the "plenum" system—which was unfortunately expensive—temperatures could be regulated with great accuracy; moreover, cool air could be supplied in hot weather by being passed through sprays of cold water or over ice.

Mr. F. Lishman said that, unfortunately, it was not always found possible to put the theories which had been advanced as to ducts, etc., into practice, but it was, nevertheless, necessary that they should have the theories to aim at. If everything that appertained to the ventilating and fitting-up of laboratories could be standardised, it would be a good day for the architects concerned, who too often found that what was good from one professor's point of view was, as likely as not, to be condemned by a new professor, with different ideas, coming on the scene. The "general" ventilation seemed to him to be of much greater importance than the local or special ventilation, for, however perfect the latter might be in detail, the carelessness of even students of chemistry was not altogether an absent quantity, and often rendered the most elaborate arrangement of hoods or draught closets more or less useless. He thought the draught closet designed by Professor Woodbridge an excellent arrangement in section, but unless it had lateral divisions—which, he understood, it was not intended to have—the fumes, it would seem, could not be kept under control.

Mr. L. Ambler regretted that there were not more present, as they would have found the paper both interesting and instructive. In experience he had found ridge ventilators efficient where used in a comparatively high roof, but not where the ceiling was lower, where they had a tendency to act as inlets. He supposed that the reference made to barristers at the Law Courts not being able to retain their wigs on account of the draughts did not include those who had "special retainers." The humming of the fans was objectionable, especially to rather deaf people, curiously

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enough. He had noticed a feeling of oppression when in hospital wards ventilated on the "plenum" system. It was curious that, in the past, the term "ventilator" was applied to a "man," whereas it was now a "hole in a wall," while in Shakespeare's "Midsummer Night's Dream," the hole in the wall was represented by one of the actors.

After Messrs. M. G. Pechell, A. S. Taylor, and C. Pickford had spoken, Mr. H. Gregory Collins, the Chairman, called upon Mr. Max Clarke, the Special Visitor, who had come down at some personal inconvenience. Mr. Clarke remarked that the important subject of ventilation was still in its infancy, and that unanimity might be attained in time. The standardising of fittings might, he thought, also come: at present there were particular people with particular articles. The Hoff Theatre, Vienna, was an instance of the perfect working of the "plenum" system where the temperatures of the various rooms were suitably regulated. The Metropolitan Opera House New York, had the hot air let in before the audience arrived; the walls thus became heated, the fresh air was then let in, and it was found to work admirably. As regards ducts he thought that, after the theoretical size had been obtained, at least a third or a quarter ought to be added in order to insure efficient working.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At a meeting of this Society, held on the 28th ult., the President (Mr. Butler Wilson) in the chair, a paper entitled "The Homes of Queen Elizabeth" was read by Mr. J. Alfred Gotch, F.S.A. Mr. Gotch referred to the fact that for some years prior to Elizabeth's reign it had been growing less incumbent that houses should be rendered secure against attack. This, together with a widespread desire for greater comfort, led to many new houses being erected and old ones remodelled. The ramifications of the renaissance of classic art reached this country, and although English tradition was predisposed to Gothic forms, the classic fashion resulted in a piquant mingling of the two styles which distinguishes most Elizabethan mansions. Numerous lantern views, illustrative of the plans, exterior and interior decorative treatment of famous examples, were exhibited. A vote of thanks was extended to the lecturer on the motion of Mr. Robert P. Oglesby, seconded by Mr. G. B. Bulmer.

SHEFFIELD SOCIETY OF ARCHITECTS.—In connection with the Sheffield Society of Architects and Surveyors, a meeting was held in the Society's rooms in Leopold-street on the 28th ult. Mr. T. Winder (President) occupied the chair, and the greater portion of the evening was devoted to a lecture given by Mr. C. M. Hadfield, entitled, "Notes on the Study of Architectural Design." In the course of his remarks, Mr. Hadfield advised all students to cultivate the faculty of accurate observation, and to avoid being partial to any particular manner or style. They should, on the contrary, obtain the best in all. He described the various ways of studying, and emphasised the necessity for trying to find out the motives which prompted the designer of a building in producing it. Concluding, he reviewed the main characteristics by which sound architecture was distinguished. A vote of thanks was accorded Mr. Hadfield, on the motion of Mr. T. M. Jenkinson, seconded by Mr. H. G. Warlow, and supported by Messrs. H. L. Paterson, J. B. Mitchell-Withers, C. B. Flockton, and others.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A meeting of the Edinburgh Architectural Association was held on the 27th ult. in the Association rooms, 117, George-street, Mr. J. A. Arnott (chairman of the Associates' Section) presiding, when a paper was read by Mr. J. Maurice Arthur, delegate from Glasgow Architectural Association, on "Some Interesting and Necessary Legal Points in Building." In the course of his paper he referred to the duties and responsibilities of an architect as arbiter and agent, and as dealing with certificates, plans, fees, and contracts. He also dealt with the laws relating to buildings, including mutual gables, flats, tenements, servitudes and ground restrictions.

LIVERPOOL ARCHITECTURAL SOCIETY.—The sixth ordinary meeting of the session of this Society was held on the 1st inst., at the rooms, Harrington-street. Mr. T. E. Eccles, vice-President, presided. A paper was read by Mr. Henry Tanner, jun., of London, on "Interior Woodwork in England." He dealt chiefly with domestic woodwork of the Renaissance period, and showed the influence of Italian and other craftsmen in developing the treatment of woodwork, and traced the various steps which marked the progress of that branch of domestic architecture. Various examples were given of panels, doors, staircases, and hall screens as illustrated in many old halls and mansions throughout the country. A number of drawings, which were exhibited, served to illustrate the various points of the lecture.

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting, on the 2nd inst., Sir William H. White, K.C.B., President, in the chair, it was announced that nine Associate members had been transferred to the class of members, *viz.*, Messrs T. Aitken, W. B. Basset, S. G. Brounger, H. H. L. Brown, W. F. Butler, W. F. Fletcher, P. T. Gask, A. P. Gray, and A. Hoare. It was also reported that five candidates had been admitted as students, *viz.*, C. L. Fortescue, B.A., A. F. Harrison, B.Sc., G. W. Hilditch, J. B. Young, B.Sc., T. A. Young. The monthly ballot resulted in the election of one Honorary member, *viz.*, The Right Hon. Viscount Kitchener of Khartoum, Commander-in-Chief of H.M. Forces in India. Seven members, *viz.*, Major Sir Robert Hanbury Brown, K.C.M.G., C. A. Hasbrouck, F. T. Marshall, A. J. Pringle, W. Rich, P. C. Ricketts, J. J. Welch. Fifteen Associate members, *viz.*, R. D. T. Alexander, Stud. Inst. C.E., J. E. Barbier, F. G. Brighton, Stud. Inst. C.E., A. W. Burford, C. L. Cartwright, E. Falk, Stud. Inst. C.E., J. Holliday, E. C. Jansen, Stud. Inst. C.E., E. W. Kitchin, Stud. Inst. C.E., R. S. Lea, H. F. Peet, R. U. Shaxby, B.A., Stud. Inst. C.E., J. R. Taylor, B.A., Stud. Inst. C.E., W. Waters, Stud Inst. C.E., C. Weekley, B.A.

Illustrations.

DESIGN FOR A CHURCH.

THIS was a competition design, not carried out, but which we are glad to publish as a fine design and drawing, executed by the architect, Mr. E. B. Lamb. It is not every architect who can produce so effective a perspective drawing of his own design.

NEW CATHOLIC CHURCH, NORWICH.

THIS church is being built by the Duke of Norfolk on a very fine site raised well above the town. When completed, with its lofty central tower, it will be a conspicuous object through the surrounding neighbourhood.

The nave, which is ten bays in length, was built by Mr. George Gilbert Scott, and the church is being carried on by his brother, Mr. J. O. Scott. The eastern part is making good progress and the triforium stage has been reached. The style of the choir is somewhat later than that of the nave, and it is treated rather more richly.

The view published (which was exhibited at the Royal Academy last year) shows the north transept with its apsidal chapel. The work is being carried on without a contractor, Mr. Burton, the able clerk of the works, having full charge. It is expected that the church will be finished in about four years.

J. OLDRID SCOTT.

STUDIOS, BOLTON GARDENS SOUTH.

THESE buildings, which are now in course of erection, have been designed with a view to combining a small bachelor's house with servants' accommodation and a large studio.

The walls are coated with Portland cement rough cast, and the roofs are grey-green slates.

The builder is Mr. Minter, and the architect Mr. Walter Cave. The drawing was exhibited at last year's Royal Academy.

VILLA, SANDIACRE, DERBYSHIRE.

THIS is a pretty sketch of a small country house by Mr. J. R. Poyser. The name of the place should, we believe, be "Sandiacre," not "Sandiacoe," as on the title of the plate.

DESIGN FOR A HOUSE FRONT IN STONE AND BRONZE.

A GOOD deal has been said recently as to the employment of metal in combination with the building materials commonly used in architecture; and the design by Mr. Smith, a drawing which was formerly exhibited at the Royal Academy, is an interesting experiment in this direction. The author writes in regard to it:—

"The purpose of this design was, as far as possible, to illustrate the use of metal applied to the surface of a wall in conjunction with stone, and to make heraldic design the basis of the scheme of ornamentation.

"By adopting family coats-of-arms and crests a certain amount of individuality could be given to the house. As will be seen from the illustration, an elaborate frieze gives scope for the covering of a large surface of ornament, and protection for this is obtained by giving great projection to the cornice. In order to emphasise the special nature of the ornament, little or no carved stone work is used, and all mouldings and other details are treated as broadly as possible. The windows, of course, can be treated with stained glass, the same scheme of decoration being followed throughout."

Correspondence.

BUILDING RULES FOR SCHOOLS.

SIR,—It is a matter of common knowledge to the Architectural profession that the building rules in respect of public elementary schools published during the last twenty years by the Board of Education (and its predecessors in title) were framed by me and revised year by year.

I find some new rules have recently been issued by the same body for the planning and equipment of secondary schools, and I had been about to disclaim any credit in respect thereof.

On examining them more particularly, I find that, except so far as founded on mine for public elementary schools, they are wrong in many particulars and ignorant or lacking in judgment as to others.

I beg, therefore, to record the fact that I have not been consulted about them, and should be very sorry to accept responsibility for any trouble they may cause to architects.

EDWARD ROBERT ROBSON.

THE GARDEN CITY.

SIR,—In your issue of January 23 you refer to this enterprise, and say that, much as you wish success to the scheme, you have grave doubts as to its success.

As I have always taken a very great interest in this movement, and believe it to be the only sound method of solving the increasing congestion in large towns, I shall be much obliged if you will allow me to point out some of the advantages from a business point of view.

Private landowners like the Duke of Devonshire in Eastbourne have already proved what a great advantage it is to have a town developed under strict rules as to open spaces, etc. Any manufacturer who moves to the Garden City will have the following great advantages:—

(1). He will have a cheap site for his factory, free from any restrictions as to light and air, or heavy premiums to ground landlords. This will enable him to construct his factory on the most approved lines, without being obliged to carefully consider every extra foot of ground he may cover. He will thus obtain infinitely better accommodation at a very much lower rent.

(2). His factory being built on the best lines, his work people will follow their occupation under very improved conditions, instead of being crowded together to the utmost extent that the Factory Act will allow; and they will be able to do their work in much healthier surroundings, and with greatly improved light and air.

(3). The work people employed in the factory will also be able to obtain cottage homes, with a garden, at a reasonable rent, which is a very much healthier form of living than being crowded together in rooms, built one on the top of another, in a crowded London slum. This will not only improve the health of the people and that of their children, but will also, no doubt, improve the quality of their work.

(4). The surrounding agricultural population will benefit by having a market for their produce brought into their midst, and there will be increased employment for agricultural labourers at better wages. At present, farm produce has such heavy tolls to pay in railway

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rates and market dues in coming into London, that very little is left for the farmer who produces it.

The Garden City has regulations which will prevent the agricultural land being forced to a great distance from the city by suburbs. This will also create a new interest for the agricultural labourers, and give them the benefits of having a town close to them.

I have no doubt of the success of the First Garden City. My only fear is that when its success is an accomplished fact there will be great difficulty in the way of acquiring other sites, owing to the prices that will be asked.

GUY M. NICHOLSON.

HOW TO POPULARISE SCULPTURE.

SIR,—The announcement that a Society of British Sculptors has been formed will be greatly welcomed by all interested in this, the neglected branch of our art. That it has been neglected by our Royal Academy must be admitted. All should appreciate your kindly notice and sympathy.

It may be a difficult task to get the general public to take an interest in the subject; and I am led to think that, to some extent, this is brought about by the sculptors themselves forgetting the general public. It is not that the general public has absolutely no interest in sculpture, but that it has not been appealed to. What is there to keep alive any interest or pleasure that may once have been created by a visit to the Academy?

The picture lover, though unable to purchase his choice, can at least in many cases purchase for a few guineas an etching or engraving, whilst the lover of sculpture has no such opportunity. If a few works, chiefly the low reliefs, of our eminent sculptors can be reproduced by some worthy student, and, when possible, under the personal supervision of the sculptor himself, and in some cheap material, even plaster—such casts being signed and numbered as etchings are—it would do much to keep alive and cultivate the interests of the general public.

A few years since, there was in the Academy a beautiful low relief, "My Thoughts Are My Children," by Mr. Frampton, and I could not help observing how this appealed to so many; possibly the sentiment attached to it added to the appeal, and I think sentiment must exist in sculpture as in painting, if an appeal is to be made to the general public. Could Mr. Frampton be persuaded to allow this to be reproduced?

I have still on my walls a few plaster casts, which I purchased many years ago at the cost of a few shillings, of works by Thorwaldsen; these are now a source of pleasure. An eminent R.A. once said to me, "A work of art is not depreciated though cast in plaster."

My contention is this: that if the general public could be appealed to, and catered for, by providing it with good reproductions of sculpture, it would show its appreciation, and a greater interest in sculpture would exist.

T. T. GETHING.

BOOKS RECEIVED.

AUTOMATIC SURVEYING INSTRUMENTS. By Thomas Ferguson. (John Bale, Sons, and Danielsson. 4s.)

The Student's Column.

ARCHES.—VI.

REFERRING again to Fig. 36 and to the action of the arch there represented, we may add that the construction of an actual model will enable the student to ascertain for himself the precise manner in which the three voussoirs arrange themselves in accordance with different conditions of the loading and of the reaction of the abutments. The principles governing the action of the three voussoirs in Fig. 36 apply equally to the case of an arch containing a larger number of voussoirs.

In a model designed for this purpose by Professor Fleeming Jenkin the voussoirs are made of wood, with their bed-joints slightly curved and roughened, and the upper ends of the blocks are shaped so that, when no extraneous load is imposed, they form a straight line, while the lower ends form a polygonal intrados approximating to a curve. The roughening of the joints is intended to prevent the blocks from slipping. The model illustrates very beautifully the action of an arch under different conditions of loading. When a load is superimposed at the crown of the arch this part is slightly depressed, owing to the rotation of the voussoirs. The curved line passing through the points of contact approaches nearer to the upper ends of the voussoirs in the crown and nearer to the lower ends of the voussoirs in the haunches. The line passing through the new points of contact represents the equilibrated polygon corresponding with the stated condition of loading.

When the superimposed load is placed over the haunches the crown of the arch is pushed upwards and the haunches are slightly depressed, the points of contact between the voussoirs approaching nearer to the upper ends of the blocks at the haunches and nearer to the lower ends of the blocks at the crown.

When only one haunch is loaded the arch is much distorted, being depressed under the load and pushed up at the other side, while the points of contact rise in the loaded side and fall in the unloaded side.

It will be found that if the model is temporarily distorted by pressure of the hand the arch will, upon removal of the pressure, oscillate up and down on each side of the position of equilibrium, its action in this respect somewhat resembling that of a loaded chain.

In such a model as this each voussoir can be slightly rotated, because the joints are curved, and although in an actual arch the joints have plane surfaces, the voussoirs really turn to some extent in the effort to adapt themselves to the pressure; but the effect of such rotation is only evidenced by unequal compression along the upper and lower parts of the voussoirs. Hence, one edge is more compressed than the other, the two forces, or couple, tending to rotate the voussoir—and actually doing so in the model—being met by an equal and opposite couple, consisting of forces due to the resistance of the material.

Hence we see that an arch ring with plane joints is in a condition of stable equilibrium, and will adapt itself to new conditions of loading very much in the same manner evidenced by the model with curved joints; but in one case the couple called into play is balanced by the opposite and equal couple resulting from the resistance of the stone to angular motion; and in the other the couple is cancelled by the new positions assumed by the points of contact.

We must remember, however, that the limits of loading within which an arched structure will remain in a condition of stability are always determined by the consideration that the linear arch must not pass beyond any joint of the actual arch. For example, if the arch were very heavily loaded over one haunch the linear arch might reach the inner end of one of the joints between the crown and the abutment. This would cause one of the joints in the model to open widely, or, in the case of an arch with plane joints, it would cause excessive stress in the material. If the load were further increased the effect would be the collapse of the arch—in the case of the model, by forcing out one of the blocks, and in the case of an actual arch with plane joints, by crushing the material.

Further, it is necessary to guard against the slipping of the voussoirs at the joints. Safety in this respect can be secured by providing that the direction of the linear arch, or line of pressure, at each joint shall not make an angle with the normal greater than the angle of repose of the material. In a plane masonry joint it can be shown by calculation that the amount by which the resultant of a uniformly varying stress may deviate from the centre of the stressed surface may be one-sixth of the width of the surface without causing reversal of the sign of the stress at the opposite edge of the surface. Hence, the rule is generally adopted in the design of masonry arches that the resultant thrust between adjoining voussoirs shall be kept within the middle third of the joint. The adoption of this rule provides a guarantee that no part of the joint shall be exposed to tensile stress. In the case of a joint formed without mortar, or in which the mortar is inoperative so far as concerns resistance to tension, the effect of permitting the resultant of the stresses to deviate beyond the middle third of the joint would be to place part of the joint out of action, thus throwing the whole of the stress upon the other part. On the other hand, if the line of pressure is kept within the middle third of every joint, all the surfaces are in compression, the stress intensity varying from zero at one end to maximum value at the other. Finally, we may add that all the joints should be of width sufficient to keep the maximum stress intensity within safe limits.

From the foregoing discussion it is clear that the failure of a masonry arch may take place in three ways:—

(1) By rotation about the edge of a joint.
(2) By crushing of the material.
(3) By the sliding of one voussoir upon another.

Figs. 37 and 38 illustrate the failure of an arch

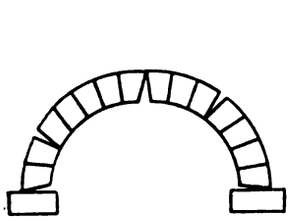

Fig. 37.

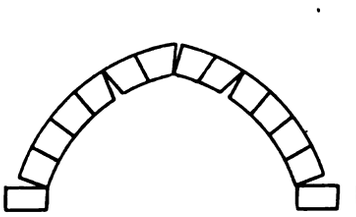

Fig. 38.

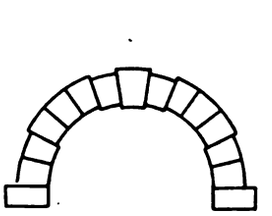

Fig. 39.

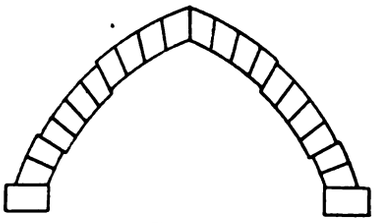

Fig. 40.

THE HAMBRO' SYNAGOGUE.—The new buildings for the Hambro' Synagogue have been erected at a cost of 3,700*l.*, upon a site having a frontage to Union-street, Commercial-road, E., after Mr. Lewis Solomon's plans and designs. The former synagogue was built on the east side of Church-row, Fenchurch-street, in 1736, by Moses (or Mordecai) Hamburger, the eminent Hebrew scholar, and a native of Hamburg. For the site of the synagogue he took the garden of his house in what was then Magpye-alley. The freeholders of the site of about 3,500 ft. superficial adjoining the Church of St. Katharine Coleman agreed to let it upon a building lease for a term of eighty years, and on the evening of November 9, 1892, a valedictory service was held in the old building, which has since been pulled down.

The equilibrated polygon passing through the joints at various distances from the centre indicates the forces acting in a practical arch with plane joints just as much as it does in a model with voussoirs having curved surfaces. It should be borne in mind, however, that in the case of an arch with plane joints, pressure must be unequally distributed wherever the polygonal line fails to pass through the centre of the joint. Variation of elastic resistance in the stone of which the voussoirs are composed corresponds to variation of curvature in the surfaces of joints. Thus, a slight distortion of the arch is sufficient to restore the condition of equilibrium when the stone has a high modulus of elasticity, or when the curvature is great.

by rotation about the joints, and, as will readily be understood by inspection of the diagrams, the method shown in Fig. 37 is more usual in the case of circular and elliptical arches with low crowns than in pointed arches.

The second mode of failure by crushing is evidently closely related to failure by rotation, because, as we have already seen, excessive pressure results from the tendency of the voussoirs to rotate under the influence of the forces applied.

Figs. 39 and 40 represent the third mode of failure. In Fig. 39 the crown slips down and the haunches slip out; while in Fig. 40 the reverse takes place. In arches where the rise is less than the span the crown generally slides

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down as in Fig. 39; but where the rise is greater than the span the haunches are usually forced inward, as in Fig. 40.

To insure safety against failure by rotation it is necessary that the line of resistance shall be entirely within the intrados and extrados of the arch. An arch built of rigid voussoirs will not fail by rotation in the manner illustrated by Fig. 37 unless the line of resistance meets the intrados at two points, one on each side of the arch, and the extrados at one point in the crown. Similarly, an arch will not fail by rotation, as shown in Fig. 38, unless the line of resistance meets the extrados at two points in the haunches and the intrados at one point in the crown.

The factor of safety to be employed for guarding against failure by overturning, or rotation about any point, is equal to half the length of the joint divided by the distance between the centre of pressure and the centre of the joint; or expressed algebraically:—

$$\text{the factor of safety} = \tfrac{1}{2}\, l \div d \quad \ldots\ldots\ldots \quad (1)$$

where l is the length of the joint, or distance measured from the intrados to the extrados; and d is the distance between the centre of pressure and the centre of the joint.

If we assume the centre of pressure to be at the boundary of the middle third of the joint between two voussoirs we have $d = \frac{1}{6} l$. Hence, by the above equation the value of the factor of safety is three. Or, if we assume the centre of pressure to be at the distance $\frac{1}{4} l$ from the middle of the joint the value of the factor of safety is two.

We have already stated that it is usual in practice to provide that the linear arch, or line of resistance, shall lie within the middle third of every joint in the arch ring. This is equivalent to the requirement that the factor of safety shall have a minimum value of three, to insure safety against failure by rotation.

Turning attention to stability against crushing of the material, and assuming that the total pressure on any joint and the centre of pressure are known, the maximum pressure at any part of the joint selected may be calculated by the equation:—

$$P = \frac{W}{l} + \frac{6\,W\,d}{l^2} \quad \ldots\ldots\ldots\ldots \quad (2)$$

where P = the maximum pressure on the joint per unit area; W = total normal pressure on the joint per unit length of the arch; l = depth of the joint; and d = distance from the centre of pressure to the middle of the joint.

This equation is applicable to masonry able to withstand tension, or to masonry assumed to be unable to withstand tension, providing in the latter case that the value of d is not greater than the value of $\frac{1}{6} l$.

For masonry incapable of resisting tension, and when d is of greater value than $\frac{1}{6} l$, the following rule should be used for determination of the maximum pressure:—

$$P = \frac{2\,W}{3\,(\frac{1}{2} l - d)} \quad \ldots\ldots\ldots\ldots \quad (3)$$

Computations may be simplified by drawing the line of resistance for the arch to be considered as in Fig. 35. The maximum pressure can then be ascertained (*a*) by resolving the resultant reaction perpendicular to a given joint, (*b*) by measuring the distance d, then substituting these values in formula (2) or (3), and (*c*) by calculating the value of P. The proper formula for use depends, of course, upon the value of d, as explained above.

In addition to the rule that the line of resistance shall be within the middle third of the joint it is usual to require that the result obtained by dividing the total pressure by the area of the joint surface shall not exceed one-twentieth of the compressive strength of the material employed. As the maximum pressure has a value equal to twice that of the mean pressure, the above stated requirements have the effect of limiting the maximum pressure to one-tenth of the crushing resistance of the material.

With regard to permissible working stresses, it may be said that the present state of knowledge as to the strength of stone and masonry makes it difficult, or impossible, to fix upon values that shall be both safe and economical. No reliable data are available as to the crushing strength of masonry under working conditions. The results hitherto obtained relate to the crushing strength of masonry for loads perpendicular to the surface, and there are no data throwing light upon the effect of the component of the pressure parallel to the surface of the joint. Generally, it is safe to assume that the crushing strength of masonry is considerably less than that of the material of which it is composed.

It should be observed that the distance of the centre of pressure from the centre of the joint does not alone determine the crushing of the masonry, for this result also depends upon the ratio between the mean pressure on the joint and the ultimate strength of the stone. If the mean pressure should be very nearly equal to the crushing strength, a slight variation in the position of the centre of pressure may cause failure of the voussoir, but if the mean pressure is small a considerable variation of position may take place without crushing the stone.

Further, it does not follow that the partial crushing of a voussoir necessarily endangers the stability of an arch, but if the centre of pressure approaches so near to the edge of a joint that too large an area of the stone becomes crushed the whole voussoir will fail, thus causing the total collapse of the arch.

From what we have stated above, it is clear that if the line of resistance passes outside the middle third of each joint, reversal of the sign of the stress will take place at the opposite edge of the joint surface, or, in other words, the opposite edge of the joint will be in tension. If lime mortar were employed, the result would be the opening of the joint, but with cement mortar joints a considerable amount of tension can be resisted, and it does not necessarily follow that the joint would be opened by reason of tension.

The existence of an open joint in an arch, although an indication that the line of resistance lies outside the middle third of the joint in question, does not imply that the stability of the arch is endangered. An open joint is not necessarily a serious matter. If occurring in the extrados, however, it may afford access for water, the freezing of which might do serious injury. Hence, it is usual to protect the extrados of masonry arches by clay puddle or other impervious material.

Resistance to sliding is afforded in practice by adhesion of the mortar and by such an arrangement of the joints that the angle made by the line of resistance with the normal shall be less than the angle of repose of the material. The coefficient of friction of masonry when the mortar is wet is about 0·50, corresponding to an angle of repose of 25 deg. Consequently, there is a possibility that one voussoir would slide on another if the angle made by the line of pressure with the normal were to exceed 25 deg. In practice, this element of danger is avoided by making the joints of the arch ring as nearly perpendicular as possible to the line of resistance. When this course is followed, very little reliance is placed upon frictional resistance or upon the adhesion of the mortar.

If the design were such as to make the angle between the line of resistance and the normal greater than the angle of repose the stability of the arch would depend upon the adhesion of the mortar, assuming the full load to be imposed. Under ordinary circumstances, an arch rarely, if ever, receives its full load before the mortar has set, but it sometimes happens that severe strains are caused by cranes used by the contractors during construction, and if lime mortar be used it is quite possible that the adhesion thereby afforded will not add sufficiently to the frictional resistance of the material to prevent failure by slipping. This consideration is a very strong argument in favour of the universal employment of cement mortar, which sets rapidly and thereby affords satisfactory assurance of security during construction, and especially in wet weather when the setting of lime mortar is necessarily delayed.

COURT OF COMMON COUNCIL:

BAKEHOUSES.

THE usual fortnightly Court of Common Council was held at the Guildhall on Thursday last week.

The officers for the year were elected, among those re-elected being Mr. Andrew Murray, Surveyor, and Mr. David James Ross, Engineer.

On the recommendation of the Streets Committee, it was agreed to offer no objection to a proposal of the London County Council to alter the position of the fire escape in Bartholomew-close, the cost of altering the shape of the refuge being borne by the Council. The same Committee recommended, and it was agreed, to grant the General Post Office authorities permission to take up the carriageways and footways of Newgate-street, Watling-street, Charterhouse-street, and Carthusian-street, for the purpose of laying certain telegraph pipes, providing that the work be carried out continuously day and night. Mr. Alpheus C. Morton, the Chairman of the Committee, was re-appointed to represent the Corporation on the Committee of Metropolitan Local Authorities on material and means of paving the streets of London.

The Sanitary Committee submitted a report from the Medical Officer of Health relative to the standard for voluntary sanitary certificates for kitchens and restaurants and above-ground bakehouses. The report stated that the practice of granting certificates as to the sanitary condition of premises had existed for many years in some districts, more especially at seaside resorts. The matter was brought forward by the Medical Officer of Health in June last, in consequence of repeated representations by owners and occupiers, who, having been called upon to carry out repairs, improvements, etc., felt strongly that as some recompense for the outlay they had made they should be in a position to exhibit a certificate that their premises were then in a satisfactory sanitary condition. The general principle was then agreed to by the Committee, and the matter was referred to the Medical Officer to report as to details of standards, etc. The suggestion of the Medical Officer of Health now was that all owners of kitchens and above-ground bakehouses should be informed that a standard of requirements had been drawn up by the Corporation, and that, upon complying with such, a certificate would be granted to the effect that the premises had been inspected and found in a satisfactory condition. Those inspections could be repeated from time to time, and fresh certificates issued. A precedent for issuing such certificates was furnished by the Customs and Inland Revenue Act, 1890, in the matter of houses let in tenements. The experience gained in dealing with underground bakehouses under the Factory and Workshop Act, 1901, was of considerable value in that connexion. Generally speaking, the main points for consideration did not differ materially in kitchens or bakehouses, underground or above ground. Thus, to insure the utmost cleanliness, the walls, floor, and ceiling were required to be impervious, the walls being as little encumbered as possible by shelves or other obstacles placed against them. That enabled the place to be thoroughly washed down and cleansed effectively and expeditiously. In the case of kitchens the proper storage of almost every class of perishable food had to be dealt with. It was, therefore, desirable that a separate store-room should be provided for the purpose. It was also a great advantage to have a separate room as a scullery for washing up, etc. In many cases it would be difficult to comply with all those obvious requirements. The standard, therefore, should not be so rigidly enforced as to press unduly on persons willing to comply as far as possible with its spirit. In submitting the following standards, the Medical Officer of Health recommended that the Committee should not refuse a certificate because the conditions could not in all respects be complied with:—

Bakehouses Above Ground: Standard for Voluntary Certificates. I. *Construction.*

(1) Floors, walls, and ceilings to be finished to a hard, smooth surface, impervious to moisture.

(2) When practicable, the floor of the bakehouse to be laid to proper falls, and be drained by suitable channels leading to a gully outside the bakehouse.

(3) The finished walls of the bakehouse to be absolutely free from dampness. Should damp walls exist, an inner wall of brickwork, at least half a brick thick, to be built, with a space between it and the damp wall of 2 in., such space to be ventilated and drained, and such half-brick wall to be tied to the existing wall or some other equally efficient and approved method is to be adopted for insuring absolute dryness.

(4) The joints of any drain passing beneath the floor of the bakehouse to be gas and water tight, and all pipes and sanitary fittings to be of the most efficient and approved type. Covers to inspection chambers to drains to be of metal, and to be double covers, both covers having an efficient seal.

(5) The bakehouse to be a minimum height of 8 ft., a minimum cubic capacity of 1,500 ft. clear of the ovens, and of any flour stored in the bakehouse, and not less than 400 cubic ft. per head for each workman employed therein.

II. *Lighting.*

(6) Where practicable, natural light only should be utilised. In cases where artificial illumination is a necessity, electricity is to be preferred, and when gas is used the incandescent type of burner, properly protected from flour dust, should be adopted, together with ample means for carrying off the products of combustion from the same.

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III. *Ventilation.*

(7) The method of ventilation to be such as to insure a constant and efficient change of air without producing draughts, and, in order that the temperature of the bakehouse shall not exceed 80° Fahr., except during the half hour after a batch of bread has been drawn. Where a fan or other mechanical appliance is necessary to effect this it must be provided.

(8) The furnace in connexion with any oven to be provided with an efficient outlet or flue to carry off sulphurous fumes generated in the process of baking; an outlet for heat and steam to be provided immediately in front of and above the oven door; the outer door of furnaces and ovens to be perfectly close fitting.

(9) Proving ovens, where necessary, are to be efficiently ventilated. Where gas is used in the process of baking, means to be provided for carrying off the fumes generated.

IV. *Generally.*

(10) Proper provision to be made for the storage of flour elsewhere than in the bakehouse, if practicable.

(11) Lavatory basins to be provided in a suitable position, outside bakehouse if possible, for the personal ablution of hands employed.

(12) Suitable water-closet accommodation to be provided for the hands employed.

(13) Storage (water) cisterns to be of the most approved type, with dust-tight fixed covers.

(14) Provision to be made for hanging wearing apparel (not worn by staff during working hours) in a suitable place outside bakehouse.

(15) Flour not to be deposited immediately on the floor, but to be stacked upon small trestles or a wooden platform raised 12 in. above the floor.

(16) All dough troughs, benches, etc., in bakehouse to be provided with casters, where necessary, to render them easily moveable.

(17) Any shelves necessary to be fixed 2 in. away from walls, and all unnecessary woodwork to be removed from walls.

(18) Jet and hose to be provided, with the necessary connexion to a proper water supply, for washing down the bakehouse in an efficient manner.

(The above standard may, on application by the proper parties, be modified in any cases where the Committee may consider there are special circumstances that justify a modification.)

In the case of kitchens of restaurants, the provisions were the same, with the addition of a provision that "hoods be placed over all stoves and ranges to carry off fumes and heat, such hoods to be in direct communication with the external air by means of a shaft or flue." On the recommendation of the Committee the provisions were agreed to, and the Committee was authorised to issue certificates accordingly.

ROYAL COMMISSION ON LONDON LOCOMOTION.

A FURTHER sitting of the Royal Commission was held on Thursday last week, under the Chairmanship of Sir David Barbour.

Mr. W. G. Shadrake (Chairman of the Leyton Urban District Council) described the tramways at present existing in the district, and said it was the intention of the Council to purchase these lines and construct new lines, to give intercommunication with the lines of the West Ham Corporation and the Walthamstow Urban District Council, and, if possible, with those of the L.C.C. at Clapton. The only railway serving the district was the Great Eastern, and they would hail with satisfaction the construction of a tube railway, such as the suggested City and North-East Suburban Electric Railway.

Mr. R. H. Scotter, C.E., a member of the Council of the Tramways and Light Railways Association, gave evidence as to the practice prevailing in foreign countries as to the granting of concessions to promoters of tramways and light railways. With regard to London, he advocated the establishment of a tribunal similar to the Light Railway Commission, which would consider all tramway, light railway, tube railway, and subway schemes. Such a tribunal should be strengthened by the addition of expert engineers of world-wide experience, able to advise both theoretically and practically upon the various traffic problems as they came before the Commission.

NEW COUNCIL HALLS. It is stated that the Holborn Borough Council have approved of a project for the erection of a new Town Hall for the borough, at an estimated expenditure of nearly 100,000*l.*, and that the Stepney Borough Council have under their consideration a scheme for a similar purpose, in view of the inadequate and inconvenient accommodation in their existing offices, which are scattered in various parts of the borough.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held on Thursday last week at the City Hall, Charing Cross-road.

The Finance Committee reported the receipt of a letter from the Local Government Board, sanctioning the borrowing of 4,300*l.*, for the reconstruction of slipper baths at the Marshall-street Baths. On the recommendation of the same Committee it was agreed to apply to the London County Council for sanction to borrow 6,000*l.*, for the purpose of defraying a moiety of the cost of paving works in Oxford-street, 1,196*l.* for the purposes of the contributions made by the City Council in connexion with the Roehampton-street improvement, and 2,763*l.* to defray the cost of certain sewer works.

Amendments to By-laws.—On the recommendation of the General Purposes Committee the following amendments of by-laws 144 and 145 were agreed to and confirmed:—

i. The supervision of all drainage works which are required to be executed pursuant to a Nuisance Notice or Order; and the construction of all water-closets, soil pipes, and other apparatus which are the subject of the provisions of the Public Health (London) Act, 1891, and the by-laws made thereunder; and the approval of all plans relating thereto shall stand referred to the Committee (*i.e.*, the Public Health Committee) and the Public Health Department.

ii. He (*i.e.*, the Medical Officer of Health) or officers duly authorised by him, shall visit daily the Works Department, and shall inspect all drainage plans and notices of drainage plans, water-closets, and soil pipes, and shall afford to the City Engineer such facilities of access to drainage plans and notices of drainage plans, etc., in the Public Health Department, and to the possession thereof, as may be necessary for the due compliance with the by-laws and standing orders.

Abolition of the Office of Chief Sanitary Inspector.—The Committee further reported that they had come to the conclusion that the Sanitary Inspectors should be under the direct control and supervision of the Medical Officer of Health, and that the office of Chief Sanitary Inpector should be abolished. Recommendations to that effect were agreed to.

Underground Dwellings. — The following report by the Medical Officer of Health was submitted by the Public Health Committee:—

"When the City was re-incorporated, it was found that, whereas in all the other parts of the City the use of underground dwellings had not been permitted, in St. James's parish a number existed. In view of the difficulty experienced by the poorer classes in obtaining other more suitable living accommodation in the district, the Council resolved (under the powers given by the Public Health (London) Act, section 96, sub-sections 3 and 4), not to turn out the occupants of these dwellings all at once, but ordered a list to be prepared, and an examination made, with a view to prevent the use of such dwellings as, in my opinion, should be closed at once, and with regard to the remainder, notices were to be served on the owner that in the event of their becoming vacant, they were, on no account, to be relet separately for living purposes.

"The use of such dwellings has been gradually decreased in accordance with the instructions of the Council, with the result that of the original number only five basement rooms are now occupied separately. Notices have been served with reference to the illegal use of underground rooms in 1901 in twenty-five instances, in 1902 in thirteen instances, and in 1903 in nineteen instances. It should be pointed out that these figures do not imply that in every case the use of the underground room has been given up for living purposes. The law still permits the use of an underground room, so long as it is occupied in conjunction with a room on another floor."

On the recommendation of the Works and Sewers Committee, amended plans of vaults to be constructed at the new motor generating station of the Westminster Electric Supply Corporation at Duke-street-gardens, Grosvenor-square, were approved. The report of the Committee referred to a letter received from the London County Council, on the question of the condition of railway bridges, and stating that any steps taken under sections 46 and 47 of the Railway Clauses Consolidation Act, 1845, must be at the instance of the local authorities. There was only one case in regard to which the Council considered it desirable to take action. The case was the bridge over the Grosvenor-road, where improvements were necessary to prevent the percolation of water. The Committee recommended, therefore, and it was agreed, that representation be made to the railway companies concerned, with a view to the improvement suggested by the City Engineer being carried out. The Committee further reported on a letter received from the Superintending Architect to the London County Council, stating that the attention of the Council had been drawn to the fact that the circus at the intersection of Regent-street and Oxford-street was known as both Regent and Oxford circus, and suggesting that the name Regent-circus should be dropped and that of Oxford-circus retained. The Committee agreed to this, and recommended that the Superintending Architect be informed that the City Council was in accord with the proposal put forward. This course was adopted.

OBITUARY.

M. CORROYER.—We regret to have to record the death, at the age of 67, of M. Edouard Corroyer, a French architect of considerable distinction, and who had been a favourite and favoured pupil of Viollet-le-Duc. M. Corroyer was for fifteen years the resident architect in charge of the Abbey of Mont. St. Michel, from which post he was removed in 1888, ostensibly in consequence of his strong opposition, on antiquarian grounds, to the Government proposal to change the original position of the dyke connecting St. Michel with the mainland; but it is probable that political or anti-clerical feeling had something to do with the removal of an architect whose sympathies were too clerical and mediæval to find favour in the eyes of an essentially rationalist Government. M. Corroyer wrote a valuable monograph on the buildings at Mont St. Michel and was author also of a work on Gothic architecture, remarkable both for its ability and interest and for the novel and rather questionable character of some of the theories embodied in it; for instance, as to the derivation of the Gothic cross-vault from the domed roofing of the churches of the south of France. The book was also misleading as to English Gothic, the monuments of which the author did not appear to have studied from personal observation; but, in spite of these drawbacks, it is a work of permanent interest. M. Corroyer was architect of the Hôtel de Ville, of Roanne, of the churches of Vougy, Villiers, and St. Cyr-les-Vignes, and of some splendid châteaux in the departments of the Aire and the Loire. He directed also the reconstruction of the Comptoir d'Escompte, and the restoration of the Cathedral of Soissons. M. Corroyer was a member of the Académie des Beaux-Arts, and "Officier" of the Legion of Honour.

GENERAL BUILDING NEWS.

MEMORIAL HALL, BURNHILL, NEAR PATSHULL.—A new memorial hall has been erected by Lord Dartmouth at Burnhill Green, near Patshull, for the recreation and entertainment of those living on and about the Patshull estate. It has been built as a memorial to the late Earl and Countess of Dartmouth. The hall has been erected from the designs of Messrs. John Weller and Sons, architects, Wolverhampton. It consists of a hall capable of accommodating (exclusive of the platform and gallery) some 200 persons, and to it is attached a caretaker's house. The building has an open timbered pitch-pine roof, stained and varnished. The structure is built with bricks made on the estate, the exterior being half-timbered and rough-cast. The hall is lighted by a bay window at each end and five side windows, all glazed with leaded glass.

HALL AND LIBRARY, EDINBURGH.—The Nelson Hall and East Branch Library, M'Donald-road, Edinburgh, was opened on the 18th ult. by the Right Hon. Sir Herbert Maxwell, Bart., M.P. In designing the building, advantage has been taken of the obtuse angle made by M'Donald-road and Leith-walk to bring out the front in a series of projections. A further feature of the exterior is a tower at the corner, and the large mullioned windows lighting up the principal rooms. Towards Leith-walk the building is three stories high, the two upper flats being set apart as houses for a librarian and a caretaker. Entering the building, immediately in front is the lending library, with accommodation for 20,000 volumes. The Nelson Hall occupies the largest portion of the building, and it is intended to be both a recreation and a news room. It measures about 76 ft. long by 50 ft. wide, divided with columns and arches, and has an open timber roof. To the left of the library there is a reading-room. On the upper flat a gymnasium has been provided, while on the basement there is a hall for small meetings. Mr. H. R. Taylor was the architect.

NAUTICAL SCHOOL, PORTISHEAD, SOMERSETSHIRE.—According to the *Bristol Times and Mirror*, 30,000*l.* will be spent upon the Nautical School for Lads which is to be erected at Portishead to take the place of the training ship Formidable. The site is at the end of the Nore-road, where fifteen acres of land belonging to the Corporation have been secured on lease at a nominal rent. A sketch of the front elevation has been prepared by Mr. Edward Gabriel, the architect, from which

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some idea of the structure may be gathered. It will be 300 ft. in length, and will rise 45 ft. from the parade ground, the idea being to give as much light and air as possible. In order to secure a proper level for the school, there will be constructed a basement, of local stone, the whole length of the building, and the apartments thus provided will be used as carpenters', tailors', shoemakers', and other shops, laundry, and for storage purposes. The roof of the basement is to be covered with a paving of patent concrete, and will serve as a parade ground, 40 ft. wide. From this level is to rise the school, a building of three stories, faced with Ionic pilasters of red brick (between the windows) and white rough cast, the roof to be covered with red Bridgwater tiles. The structure will really consist of two blocks, united by a central square tower, through which is the main entrance. Around it is an ornamental doorway, at the top of which are figures of Neptune and Britannia. The tower, which is to contain a clock, rises to a height of 70 ft., finishing with a wood and copper flèche. There are to be small towers at the corner of each main block, in which are to be the staircases for the lads. The two upper floors are to be used as dormitories, and from each dormitory there will be two staircases for use in case of emergency. The entrances for the boys are to be on each side of the central tower. The ground floor of the west block is intended for the purposes of a mess-room for the boys and officers' mess-room, with kitchen, scullery, and stores in the rear. At the west end of the block are to be the chief officer's house and rooms for the resident schoolmaster. The school-room and class-rooms, teachers' room, and library are to be on the ground floor of the east block. At the rear of this block is to be a bay for sick boys, for which a separate cottage hospital will be hereafter substituted if funds be forthcoming. At the extreme east of the building is a gabled residence for the captain-superintendent, which will be connected by a covered way with the main building. The centre block is to contain committee rooms on one side of the main entrance, and offices for the captain-superintendent on the other side. On the second floor there are to be spare cabins for officers and any old boys who may hereafter visit the institution. Each dormitory will have four officers' cabins, from which the whole of the dormitories can be seen. Passing through the main entrance, access will be gained to the gymnasium, which is to be in the centre of the building at the rear. The apartment, the dimensions of which will be 80 ft. by 50 ft. and 20 ft. high to the springing of the roof, may be also used for meetings, or for services when weather may prevent the boys attending church. The floors of the dormitories are to be of solid balk timber, tongued together, to resemble the deck of a vessel as much as possible. The lads will sleep in hammocks, as on board ship. Careful consideration has been given to the question of drainage. It will be carried to the north-west corner of the site, to septic tanks, and there be treated on the principle devised by Mr. F. W. Stoddart, and the effluent will be taken into the sea. The rainwater is to be collected in large tanks beneath the central part of the building, and will be used for the laundry and for the boilers. Water for culinary and drinking purposes may be obtained from the mains of the Portishead Water Company, or from a well. The institution is to be warmed by hot water, passing through low-pressure pipes. Accommodation will be afforded for from 350 to 400 boys. Tenders have been accepted from Messrs. Cowlin for carrying out the whole of the scheme.

ST. LUKE'S CHURCH, THORNABY.—The consecration of St. Luke's Church, Thornaby-on-Tees, has just taken place. The building is complete as to the ground floor, but the upper portion of the tower is wanting, and the whole of the roofs are without any internal wood finishings. The walls are of stone faced with snecked blockers inside and out: The plan consists of nave and aisles, transepts, chancel, morning chapel, and vestries, the extreme length being 111 ft., and the width across transepts 75 ft. The morning chapel is under the tower. The arrangement at the east end consists of two tiers of three windows, all of which are round-headed, with the exception of the centre window in the upper tier, which is lancet-headed. In the interior detached shafts with caps and bases are provided between the windows supporting the label mouldings. There is also a rose window in the west gable. The internal wood fittings are of pitch-pine. Sitting accommodation is provided for 700. The floors under seats are of redwood blocks, the passages are in red cement, and the sacrarium is paved with alternate squares of red and white Mansfield stone. The church is lighted with incandescent gas, by Mr. Downing, Thornaby; and heated by hot water on the low-pressure system, the apparatus being supplied by Messrs. Blakeborough and Rhodes, Stockton. The designer of the church was the late Mr. W. S. Hicks, and it has been completed under the superintendence of the present firm of Messrs. Hicks and Charlewood, architects, Newcastle. The builder is Mr. Henry Harwood, of Manfield, near Darlington.

WESLEYAN CHAPEL, SWANSEA.—The new Wesleyan Chapel, situate in St. Albans-road, Brynmill, Swansea, has just been dedicated. The building, which will accommodate 400 adults and 500 children, has a stone frontage. The woodwork interior is of pitch-pine, and heated with hot water apparatus and lighted by gas. The whole structure cost 1,500*l.* and the architect was Mr. W. Beddoe Rees, Cardiff, and the builders were Messrs. J. and G. Jones, Swansea. It was decided to erect the school first, which provides accommodation for 500 scholars. On the ground floor transepts are provided on each side, in which is a gallery. Under the galleries two class-rooms can be made on each side by movable partitions. At the rear three additional class-rooms are provided on the ground floor, and three over, on a level with the galleries. In all ten class-rooms are provided. A heating apparatus is provided, as well as fire-places in each class-room. The glazing is in cathedral glass, and the buildings throughout are lighted by gas. The scheme, when completed, will cost about 6,000*l.*

WESLEYAN CHURCH, LOWESTOFT.—A new Wesleyan Church, situate at the London-road end of Lorne Park-road, Lowestoft, has just been opened. The building is designated a school-chapel, and a portion will eventually be thrown into the church. The present building is 36 ft. wide, 53 ft. long, and 36 ft. high, to the centre of the ceiling; it is built of red brick, with white stone dressings. Internally the walls are of plaster, with a pitch-pine roof, hammer beam trusses, and plaster ceiling. The gallery has a stone staircase, and the building two entrances—one in Lawson-road and the other in Lorne Park-road. The architect was Mr. G. E. Smith, of Southsea, and the builders were Messrs. Smith and Wolff, of Lowestoft, the stonework being supplied by Messrs. Wolff and Brown, also of Lowestoft. The church has seating accommodation for 400 worshippers.

WESLEYAN CHURCH, SALTBURN.—On the 25th ult. the foundation stones of a new Wesleyan church were laid at Saltburn. The style of the new edifice, which will occupy a site in the centre of the town, will be late Gothic, and the stone for its construction will be obtained from the Pately Bridge quarries, the roofs being covered with red tiles. A feature of the external design is the tower and spire, which rises to a height of 100 ft. The contract for the whole work has been let to Messrs. T. Dickinson and Son, of West Hartlepool and Saltburn, and the structure will be carried out from the designs and under the superintendence of Messrs. Garside and Pennington, architects, of Pontefract and Castleford.

PUBLIC LIBRARY, CIRENCESTER.—The foundation-stone of a new public library at Cirencester was laid recently by Earl Bathurst, C.M.G. The new building will be Tudor in style, and will consist of a news reading-room, a games and smoking room, etc. Mr. V. A. Lawson, A.M.Inst.C.E., Cirencester, is the architect, and Mr. G. Drew, also of Cirencester, the builder.

ST. MATTHEW'S CHURCH, COCKINGTON, TORQUAY.—St. Matthew's Church, Chelston, in the parish of Cockington, has been structurally completed, and dedicated. The selection of the design was made by the editor of the *Builder*, and his choice fell upon that of Mr. (now Sir) Charles A. Nicholson, of London. The building was illustrated and described in our issue for June 30, 1894. The first part of the church was erected by Messrs. R. F. Yeo and Sons, the second part by Messrs. E. P. Bovey and Son. Messrs. Jenkins and Son constructed the baptistry and font. The carving of the choir stalls was executed by Mr. H. K. Kuchemann, of Hammersmith. The greater part of the other carving in the church, including the pulpit, is the handiwork of Mr. Read, of Exeter.

WORKHOUSE, STOURBRIDGE.—The foundation-stone of the new Workhouse for Stourbridge Union was laid on the 22nd ult. The contract for the Workhouse buildings is 95,500*l.*, and for the children's quarters about 10,000*l.* The architect is Mr. Marshall.

INSTITUTE, NEWPORT, MON.—The new Church Institute built as an adjunct to and almost adjoining St. John the Baptist Church at Newport, has just been opened. It has been built by Mr. E. C. Jordan, of Newport, from plans by Messrs. Lansdown and Griggs, architects, of Newport. Built largely of red brick upon a site given by Lord Tredegar, the new hall has a seating capacity of about 200. There is a ground floor space of 40 ft. by 30 ft., a platform of 26 ft. by 30 ft., and an underground school-room of 30 ft. by 20 ft.

CHURCH, BEN RHYDDING.—It has been decided to build a church at Ilkley, to seat from 300 to 400, at an estimated cost of 3,000*l.* (exclusive of the land). A site has been purchased at a cost of 650*l.*, and plans have been prepared by Mr. H. S. Chorley, architect, Leeds.

INSTITUTE, LEEDS.—The Victoria Memorial Institute, which has been erected at Potternewton, Leeds, is now completed. The new building has been designed by Mr. Percy Robinson, and the cost has been about 3,500*l.*

POLICE STATION AND FREE LIBRARY, LEEDS.—The Police Station and Public Free Library which has just been provided for the Chapel-town suburb of Leeds, was opened on the 20th ult. The architect was Mr. W. H. Thorp.

POLICE COURT, WESTMINSTER.—The new Westminster Police Court building in Rochester-row, the estimated cost of which was 12,000*l.*, erected by Messrs. F. and H. Higgs from the designs of Mr. J. Dixon Butler, Surveyor to the Metropolitan Police, have just been completed. Over the bench is a carved Royal coat-of-arms of early Hanoverian period, which formerly adorned one of the old courts at Westminster Hall.

TRURO CATHEDRAL TOWER AND SPIRE.—On the 22nd ult. the benediction ceremony took place of the tower and spire of Truro Cathedral, which have been built through the generosity of Mr. J. Hawke Dennis, of Grevehurst Park, Capel, Surrey, and formerly of Redruth, at a cost of nearly 15,000*l.* The tower is square on plan. Above the roofs it is divided into two unequal stages, all four sides, except for the slight variation in width, being alike. The lower or lantern stage is the smaller of the two, and has three two-light windows, deeply recessed in three orders. These windows are visible from the inside of the church, and form the lights of the lantern, the vaulted ceiling of which comes immediately above them, rising about 35 ft. above the vaulted ceiling of the nave. The upper or belfry stage also has three two-light windows, but these are of much taller proportion; they are also more deeply recessed, and are filled with oak louvres covered with copper. The heads of these windows are crowned by sharply-pointed gables, which finish under the overhanging corbel course, which comes immediately under the tower parapet. This parapet is pierced and traceried, and is divided into three sections corresponding to the windows below by miniature buttresses. The height to the string under the lower parapet is 156 ft. The spire rises in simple and unbroken outline from a rich cluster of pinnacles, and spire lights which are grouped round its base. The four angle pinnacles are hexagonal on plan, panelled in two stages with coupled lancets on each face, and capped with slender spires. They are connected to the central tower by a web of stone, which is gabled and panelled. There is an elaborate spire-light in the centre of each of the four cardinal faces of the spire, with tall clustered shafts supporting the traceried head. The total height to the top of the spire is 250 ft. Carved on the pier of the tower is an inscription.—*Western Morning News.*

CAMPDEN HILL COURT.—We are informed that the amount of Mr. C. Gray's contract for Campden Hill Court (D. & E. Blocks) is 58,100*l.* and not 56,100*l.*, as stated in our last issue.

SANITARY AND ENGINEERING NEWS.

SEWAGE SCHEME, FOLESHILL.—At Foleshill Workhouse, on the 26th ult., Mr. W. O. E. Meede King, Local Government Board Inspector, held an enquiry into an application of the Foleshill Rural District Council to borrow 27,000*l.* for the purpose of sewerage and sewage disposal. Dr. Bostock Hill (the County Medical Officer of Health) and Mr. Nicolson Lailey (Engineer, who had prepared the scheme), were among those present. Mr. Oswin, the Clerk, explained that a tender had been provisionally accepted amounting to 20,497*l.*, and the amount to be borrowed would cover all contingencies. Mr. Lailey described the scheme in detail, and said some modifications might be made to bring the cost of the scheme within the Council's borrowing powers. The present population who would use the scheme totalled 5,614, and the scheme provided for a population of 8,000.

THE LAND REGISTRY.—Some new regulations have been made by the Land Registry Office which will greatly reduce the cost of registering an absolute title, whilst simplifying the present course of procedure. The registration of an absolute title carries with it an immediate guarantee of validity, and obviates the delays involved by the registration of a possessory title, under which a long period must elapse before the benefit of the registration can be obtained. Thus far, the majority of applications for titles entered upon the general register for the County of London belong to the latter category.

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FOREIGN.

FRANCE.—The City of Orléans has opened a competition for the construction of a Museum of Painting and Sculpture, and also for Natural History. There will be a preliminary sketch competition, and the author of the design chosen in the final competition will receive a premium of 100*l.* and be entrusted with the execution of the work. A second *premium* of 80*l.* will be awarded. The cost of the building is limited to 48,000*l.*; the jury will comprise a representative of the Minister of Fine Arts, a curator of one of the Paris Museums, a member of the Académie des Beaux-Arts, a member of the Conseil des Bâtiments Civils, and two architects to be appointed by the Société Centrale.——The Municipal Council of Bordeaux has definitely voted a demand for borrowing powers to the *amount* of 1,600,000*l.* for the purpose of various important works connected with new street sewers and drainage, various public and scholastic buildings, and the reconstruction of certain quarters of the town. An agreement has been entered into with M. Albert Soula, banker at Bordeaux, to concede to him, for the sum of 320,000*l.*, a large portion of ground which will become vacant on the pulling down of some old Municipal property, and M. Soula agrees to build on the whole of this ground, before the expiration of six years, the work to be executed exclusively by local labour, a *margin* of 10 per cent. being allowed for the employment of outside labour for special cases.——The town of Nice has recently organised a series of annual competitions destined to encourage architects and builders to give their best efforts towards the embellishment and sanitation of the town. These competitions are divided into six categories, as follows, three of which take place each year: First, private edifices open to the public, such as *churches*, schools, convents, theatres, concert halls, hotels, restaurants, works, and shops, etc. Second, private buildings, such as palaces, *châteaux*, private houses, and the better class of "maison à loyer." Third, ordinary "maisons à loyer." Fourth, economical dwellings. Fifth, smaller works, such as fountains, railings, doorways, shop-fronts, sign-boards, etc., on the public street. Sixth, parks and gardens. Medals of gold, silver, and *bronze* are to be awarded, and a "plaquette" placed on the premiated work. The awards are distributed between the owner, architect, *and artist-gardener*.

AUSTRIA.—The foundations have been laid for a new museum for students in Vienna; the building is to contain twenty-one rooms, which are to be divided into sixteen departments; it will also possess a small observatory.——The stage of the Court Opera House is to be reconstructed, as it is too small for modern requirements. The work can only be carried out by *degrees*, at the season when the Opera House is closed, so it will not be completed for several years.——The Carmelite Hospital *is to be* pulled down, and a Poor House will be erected on the site.——A new station is to be built at Budweis.——A *sufficient* sum has been granted at Teplitz-Schonau for the building of a new museum.——The building of the Lunatic Asylum at Trieste has been entrusted to the engineers Comel, Finetti, and Venezian.——The Church of the Annunciation at Pardubitz is to be restored at a cost of 18,000 kreuzers.——The Moldau has been rendered navigable between Prague and Melnik.——Professor Eugen Schwiedland has been appointed Professor of *Political Economy* at the Technical School in Vienna. Dr. Schwiedland was at one time part editor of the *Revue d'Economie Politique*, which is published in Paris, and which bears an international character.——The sculptor Professor Rudolf Weyr has been entrusted with the execution of a memorial to Hans Canon in Vienna; the statue, which will be larger than life size, will probably be unveiled in the summer.——At the instance of the painter Herr Emil Uhl several artists have approached the Town Council of Karlsbad with the suggestion that a hall should be built, in which exhibitions of art could be held. The subject is under consideration.——The church of St. Wenceslaus, at Prague, is to be restored, under the direction of the architect, Herr Fanta.

GERMANY.—It has been decided to build the new School of Commerce in Cologne according to the plans of Herr E. Vetterlein, which were awarded the first premium.——The annual meeting of the Society of German Architects and Engineers will take place in September at Dusseldorf, where there is also to be an exhibition of landscape gardening.——An important footbridge has been built from the right bank of the river Havel at Spandau to Eiswerder Island. This was found necessary owing to the large number of men who had to be taken across the river twice a day in steamers to and from the Arsenal on the island. The bridge has a span of 200 metres, and the work has been carried out by the firms of Harkort, of Duisberg, and R. Schneider, of Berlin, under the superintendence of Messrs. Richter and Neubert.

SWITZERLAND.—The Corporation of Oerlikon has decided to convert the wooded land near the School Houses into a public park.——The architects Herr Yonner and Herr Jaquillard, of Neuchâtel, have undertaken the extension of the Kurhaus at Interlaken.——The new theatre at Berne is completed; the architect is Herr von Wurstemberger, and the stage machinery has been supplied by the firm of L. A. Riedinger, under the superintendence of C. Lautenschläger.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The Paul Heater and Condenser Company, of 63, Queen Victoria-street, E.C., have appointed Messrs. Herbert and Gilchrist, 146, West Regent-street, Glasgow, as their agents for the Glasgow district.—Mr. Frank S. Mayo, of 11, Queen Victoria-street, E.C., has been appointed sole London agent for the sale of glazed bricks manufactured by Messrs. James Woodward, of Swadlincote.

HOUSING ACCOMMODATION, PLYMOUTH.—Three months ago a proposal was adopted by the Housing Committee of the Plymouth Town Council, on the initiative of the Chairman (Mr. E. R. Hilson), that, before any further action was taken in regard to increasing the number of workmen's dwellings, a return should be prepared showing the number of vacant houses and tenements in the borough which could be considered suitable for working-class accommodation. For some time past it has been well known that very many of the middle-class dwellings in Plymouth have remained untenanted, and the committee realised that the provision of additional workmen's homes would be calculated to render still more acute the difficulty experienced by builders in getting the unoccupied houses off their hands. The return presented to the Committee shows that on October 19 of last year the number of self-contained houses unoccupied in the various wards at rentals of from 30*l.* to 120*l.* per annum was as follows:—Laira, sixty-five; Vintry, six; Greenbank, twenty; Hoe, eighteen; Compton, fifty-seven; Frankfort, three; Sutton, six; Friary, thirteen; St. Peter's, two; Charles, nine; Drake's, eight; St. Andrew's, none; Millbay, one; and Mutley, fifty-eight; a total of 266. The unoccupied self-contained tenements at the same date were:—Laira, 105; Vintry, eleven; Greenbank, one; Hoe, seventeen; Compton, seven; Frankfort, fifteen; Sutton, thirty-eight; Friary, sixteen; St. Peter's, two; Charles, four; Drake's, two; St. Andrew's, six; Millbay, eleven; and Mutley, twenty-eight; total, 263. The statement also shows the number of rooms unoccupied in tenements as follows:—Laira, 455; Vintry, forty-four; Greenbank, nine; Hoe, eighty-two; Compton, twenty-eight; Frankfort, thirty-six; Sutton, 166; Friary, ninety-three; St. Peter's, six; Charles, fifty-four; Drake's, four; St. Andrew's, thirty-eight; Millbay, fifty-four; Mutley, 134; total, 1,203.—*Western Mercury.*

DEVONSHIRE MARBLES.—The Phœnix Marble Works (Plymouth) send us some specimens of the Devonshire marbles in which they deal. These are beautifully-marked marbles, and afford a great variety of fine colour, both warm and cool. The "Prince Rock Grey," the "White-veined Black," the "Favoriditæ," and the "Clouded Yellow" are all most effective marbles, and all these can be had in blocks "up to any reasonable length," as the owners put it. Some of the other kinds can only be had in comparatively small sizes, though they may be useful in special situations.

MARKET EXTENSION, NEWTON ABBOT.—On the 21st ult. Mr. F. H. Tulloch, M.Inst.C.E., Local Government Board inspector, held an inquiry at Newton Abbot into the application of the Urban District Council for sanction to borrow 4,140*l.* for covering in a portion of the River Lemon and for other works in connexion therewith. Mr. F. Watts, Clerk to the Council, explained that the Council, finding the business of the markets greatly increasing, and that there was not sufficient accommodation for the numbers of cattle sent in for sale, obtained under a Provisional Order power to borrow 12,000*l.* Of that amount 2,500*l.* had already been raised for buying land to extend the markets; and 4,100*l.* was now applied for to cover over the River Lemon, which at present, with a road, divided the markets from the land purchased for additional market accommodation. In addition to the surveyor's scheme, there was another, prepared by Mr. John Chudleigh, a member of the District Council. The Council at present recommended the surveyor's scheme. If, however, it was thought that Mr. Chudleigh's was the more desirable, it was quite prepared to fall in with that view. A portion of the scheme prepared by the surveyor involved the duplicating of the sewer under the Lemon, the deepening of the river, and the affording of sufficient waterway to prevent damage in case of flooding. It was on this particular point that difference of opinion had arisen. After Mr. Lewis Stevens, Surveyor to the District Council, had given a detailed explanation of his scheme, Mr. J. Chudleigh, architect, said that the surveyor's estimate for covering and deepening the Lemon was 3,500*l.*; he (Mr. Chudleigh) said it could be done quite as effectively for 2,000*l.* In reply to the inspector, Mr. Chudleigh said an increased waterway could be got by building two culverts instead of one, but it would involve much additional expense. He did not want his scheme adopted, but the Council should have called in outside professional advice. The surveyor's scheme was faulty in design and wasteful in details. Other members of the Council having spoken, the Surveyor replied to the criticisms of his scheme, and the inquiry closed.

GLASGOW BUILDING TRADES EXCHANGE, LTD.—A general meeting of the Glasgow Building Trades Exchange, Ltd., was held on the 27th ult. in the News Chambers, Glasgow, Deacon James Goldie presiding. Mr. David Cook, Secretary, read a paper on "The Relations of Proprietor, Architect, and Contractor." Mr. Cook first dealt with the qualifications of an architect and his relation towards the proprietor when preparing plans and when he was supervising the building. He pointed out that, while originally he was only an architect, he afterwards became the agent of the proprietor, and was under the legal conditions which existed between agent and client. Proceeding to deal with special cases, Mr. Cook discussed how far the architect's authority went in his relationship to the builder and the proprietor, and whether, if he exceeded his authority, the builder must suffer or the proprietor. He said if the architect really exceeded his authority the proprietor suffered, but had recourse against the architect. Again, if there was no blame attached to the proprietor, then the builder suffered, but had recourse against the architect. In conclusion, he dwelt upon the amount of supervision an architect was bound to exercise in supervising a work.

BUILDING PLANS, PRESTWICH.—A meeting of the Prestwich Union Guardians was held on the 28th ult. Mr. Joseph Pickvance presided. The General Purposes Committee recommended that Messrs. T. Worthington and Sons, Manchester, be appointed as architects for the new Infirmary to be erected by the Board on the Booth Hall Estate at Blackley. Mr. Lee moved an amendment that the proceedings be referred back for further consideration. He thought that designs ought to be obtained by public competition. The Rev. W. Sassen seconded the amendment. When the Board was going to spend 50,000*l.* or 60,000*l.*, he said, it was only right that something like a competition should take place. Moreover, it would be fair to the architectural profession. Mr. Hulton said that Mr. Jenner Fust, the Local Government Board Inspector, advised them that it would be better to draw lots as to who should be the architect. It was entirely a question of saving time. Mr. Birchenall supported the amendment. In a large undertaking like this he contended that they ought to have competitive designs. For the amendment there were three votes, and all the other members of the Board voted against it. The recommendations of the Committee were adopted.

BELFAST BUILDERS' ASSOCIATION.—On the 26th ult. the annual meeting of the Belfast Builders' Association was held, followed by the annual dinner in the evening. The meeting took place in the offices, 14, Arthur-street, the President, Mr. John Martin, J.P., being in the chair. The Secretary read the annual report of the Committee, which was unanimously agreed to. It stated:—It is unfortunate to again relate that the building trade has in no way improved. Materials continue at high prices, and labour is considerably in excess of demand.—The balance sheet was presented by the Hon. Treasurer, Robert B. Henry, J.P., and showed the finances of the Association to be in a satisfactory state. The election of officers resulted as follows:—President, Mr. John Martin, J.P.; Vice-President, Mr. Robert Corry, J.P.; Hon. Treasurer, Mr. Robert B. Henry, J.P.; Committee, Messrs. W. J. Campbell, J. Courtney, W. H. M'Laughlin, John Smith, S. B. Thompson, James N. M'Cammond, John P. Corry, and W. J. Stewart. The dinner was held at the Grand Central Hotel. In the unavoidable absence of the President, Mr. John Martin, J.P., the chair was taken by Mr. R. B. Henry, J.P. The loyal toast having been honoured, "The Public Boards of Belfast" was proposed by the Chairman. The Corporation had perfected a main drainage scheme, and now, thanks to the advance of science, they were taking steps to

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ascertain the best means of treating the sewage. They had at present in hand a new City Hall, which, from all they could see, both as regarded design and the execution of the work, would reflect credit upon both the architect and the builders.—The Lord Mayor responded. Regarding the main drainage, it had received severe criticism, but he thought they would admit that it was utterly impossible to conceive a large scheme in which fault could not be found on one or two points. The question of flooding had received careful consideration on the part of the Improvement Committee, and he believed with the improvements which had been carried out and the other measures that would be taken they would not have a repetition of the flooding which had caused so much damage to property in the city. Of course the low-lying parts would always be liable to flooding when the tide was particularly high. The new City Hall was another sore point, not because of the architect or the builder, but because they had not yet got possession of the building. If there was ever any city in need of such a hall it was certainly Belfast. Their present Town Hall was totally inadequate in accommodation, and perhaps they would doubtless be surprised to hear that if all the aldermen and councillors, numbering sixty, attended the Council Chamber at once there would not be sufficient seats for them.—Mr. John Davidson, J.P., replying on behalf of the Harbour Commissioners, said that the Commissioners, in their desire to bring to the city a share of the Admiralty work, had commenced a new graving dock which, to use an American phrase, would be the largest in the world. It would accommodate the largest vessels made, and so would bring increased trade to their city.—Mr. William Kerr, who responded for the Water Board, said their aim was to procure pure water, and he believed the citizens would be entirely satisfied with the Mourne scheme.—Mr. W. H. M'Laughlin proposed "The Ulster Society of Architects."—Mr. W. J. Gilliland, President of the Ulster Society of Architects, responded. He said that in certain classes of builders the architect was regarded in the light of a schoolmaster who set an uncongenial task which should, if possible, be shirked. The real builder would understand that the most severe architect was his best friend in disguise. In his experience he found that the builders who had been unsuccessful in Belfast were, as a rule, those who had tried surreptitious dodges, and put in work which was of an inferior character. The architect might be called a terror, but he was only a terror to evil-doers. He was glad to observe that in connexion with the designs for the branch libraries, the Library and Technical Committee had appointed Sir Thomas Drew as an assessor to prepare the conditions for the competition.—The health of the guests was proposed by Mr. John Smith, and acknowledged by Mr. J. C. White and Mr. S. C. Hunter. The Lord Mayor asked the guests present to drink the toast of "The Builders' Association," to which the Chairman replied.

BARROW MASTER BUILDERS' ASSOCIATION.—The members of this Association assembled at the Victoria Park Hotel, Barrow, recently, on the occasion of the annual banquet. Mr. W. Ramsay, the President, was in the chair, and Councillor J. N. Neal occupied the vice-chair. The loyal and patriotic toasts having been honoured, Mr. Saddler, in proposing the toast of the "Borough Surveyor and Architects," said the interests of the master builders were inseparably bound up with those of the architects. On an occasion like that they were inclined to criticise the architects, and endeavour, if possible, to let them see themselves as they were seen by that Association. He did not know that he had the courage to say very much about them that evening, after what had taken place at the last meeting of the Council, when two members of that Association, who were also councillors, made a supreme effort to have the architectural work of the borough again restored to the architects in private practice. They did not succeed, however, and it seemed to him that the Corporation did not understand the question as it was understood by the members of that Association. Work had been slack, and he thought that the offices of the architects might as well be closed up, yet notwithstanding that they had decided to dump into the Corporation offices additional architects to do their work. He thought the Council did not know the capabilities of the local architects. He believed the Borough Surveyor had justified his appointment, and had gained the confidence of the Corporation. Messrs. M. Stables, J. Butler, and E. M. Young suitably responded. Mr. E. M. Young, in the course of his remarks, suggested the desirability of the Corporation having powers to approve of elevations of buildings as well as of sanitary matters, and referred to the custom on the Continent, where, in the main thoroughfares of their cities, all elevations had to be approved by the authorities, and no building could be erected unless it would be an ornament to their cities. Mr. Young also wished it to be understood that in putting up good architectural buildings it did not necessarily follow that these buildings would be costly, for if the architect paid proper attention to the proportion of his building, good detail, and the fitness of things, as well as a proper distribution of material, the effect would be good at a comparatively small cost.—Alderman Barrow, in submitting the toast of the evening, "Success to the Master Builders' Association," said he did not think that the protection craze had been taken up by the Corporation, but there were occasions when it was desirable that they should have a staff, which had been trained to what he conceived to be an extremely difficult profession, that of architect, and which would be able to render to the Corporation some assistance in the supervision of plans that might be submitted to them by private architects. When they wanted to build the Technical Schools there was an open competition amongst the architects. He thought when the time came for school extension in the borough that private architects would have an opportunity of engaging in that work. The great defect of English towns compared with Continental towns was the unfortunate sameness of the buildings. He believed that Association was doing a great amount of good and consolidating the builders into one compact body.—The President, in replying to the toast, said although the Association was only five years old, it was becoming stronger, and the benefits accruing from it were becoming more manifest. Other toasts followed.

YORKSHIRE FEDERATION OF BUILDING TRADE EMPLOYERS.—The members of the Yorkshire Federation of Building Trade Employers visited Hull on the 21st ult. to hold their annual dinner, which took place at Powolny's Restaurant. About 200 members and friends were present. Mr. E. Good presided, and he was supported by the Mayor (Alderman W. Jarman), Sir Alfred Gelder, J.P., the Sheriff (Mr. J. H. Fisher, J.P.), Mr. A. Moulson (of Bradford, Vice-President of the Federation), Alderman Jessop, J. P. (of Huddersfield), Councillor England (of Barnsley), Mr. P. Rhodes (of Leeds), Mr. T. Goates, Mr. P. Gaskell, Mr. J. Watson, Colonel Jacobs, Mr. F. Beilby (President of Hull Branch), Councillor G. L. Scott, J.P. (Vice-President), Mr. T. Marsden, Mr. W. Hoggard (of Bridlington), Councillor Lyons (of Malton), Mr. J. Townsley, Mr. J. A. Brown, Mr. P. Runton, Mr. L. Kitchen, and Mr. G. Stanley (Secretary). The loyal and patriotic toasts having been honoured, Sir Alfred Gelder gave the toast of "The National Association." He said that one of their principal difficulties with local builders was that they did not get on fast enough with their work. They were always being told that the Americans were more expeditious, and he would like to see them wipe out that stigma. The outlook in the building trade at the present time was not of a most prosperous character, but he thought there was a wonderful recuperative power in the English nation.—Alderman Jessop, an ex-Mayor of Huddersfield, and President-Designate of the National Association, responded. He said they had heard a great deal about the Americans and their hustling, but he did not know that England would be much better if they started hustling up their buildings. The buildings put up in America were not half as substantial as the buildings put up in this country.—Councillor England proposed the toast of "The Mayor and Corporation of Hull," and Alderman Jarman, replying, made allusion to the great improvements carried out in the city of late years. The toast of "The City and Trade of Hull" was proposed by Mr. P. Rhodes, of Leeds. Alderman Larard, responding, said he believed the trade of Hull would soon recover from the present slackness. He challenged contradiction when he said that Hull was rapidly becoming, if it had not already become, the best paved city in the United Kingdom. Latterly they had had some discussion with reference to the cost and the way the streets were cleansed in Hull. They must remember that Hull was naturally flat, and that the state of the sub-soil was certainly not conducive to cleanliness, and, therefore, what cleanliness they might have was the result of hard work and attention. In 1890 the Corporation had ninety miles of streets in their scavenging contracts; in 1898 106 miles, and in 1904 114½ miles, so that they had had a large increase in the mileage of the city because the city was growing. In 1890 the Corporation had 194 miles of streets swept per week; in 1898 282 miles; and in 1904 325 miles.—The Sheriff proposed the toast of "The Yorkshire Federation," and said he took it that the Federation was formed for the purpose of protection. The Chairman replied, and said the only object the Federation had in view was equity, in order that they might cope with the difficulties which arose from time to time. Had it not been for the Yorkshire Federation, notwithstanding the unfortunate crisis which took place in Hull five years ago, there would have been many other irruptions in this part of the country. They did not wish to oppose the rights of other people or the rights of the workmen. If they could only adjust the great labour problems, it would augur well not only for the success of the building trade, but for the prosperity of the whole country. Other toasts followed. Prior to the dinner, a meeting of the Federation was held, the President in the chair. Representatives were present from Huddersfield, Bradford, Barnsley, Sheffield, Halifax, Wakefield, Leeds, Scarborough, Bridlington, Selby, Malton, and Hull.

ROYAL ACADEMY LECTURES.—On Monday, the 8th inst., a course of lectures on sculpture will be commenced by a lecture by Mr. W. R. Colton, A.R.A., on "Enthusiasm in the Pursuit of Sculpture." The course will be continued by lectures by Dr. A. S. Murray, the subjects being arranged as follows:—Monday, February 15, "Sarcophagi"; Thursday, February 18, "Athenian Stelæ"; Monday, February 22, "Sculptured Pedestals"; and Thursday, February 25, "The Niobides in Florence." On Monday, February 29, Professor Aitchison will commence a course of four lectures on "Vitruvius," to be continued on Thursday, March 3, Monday, March 7, and Thursday, March 10.

SOUTH-WESTERN BUILDING TRADES EMPLOYERS' FEDERATION.—The annual meeting of this Federation was held at the Mitre Hotel, Hereford, on the 21st ult. The chair was taken by Mr. W. P. Lewis (Hereford), the President of the Federation, and amongst those present were Messrs. E. J. Neale, President Bristol Master Builders' Association; F. N. Cowlin, (Cowlin and Sons, Bristol), George Humphreys (Bristol), J. Long (Long and Sons, Bath), E.W. Wooster (Hayward and Wooster, Bath), C. Bryer (Bridgwater), R. Bowers, E. W. Wilks, W. Cooke, William Powell, W. P. Lewis, jun. (Hereford). The Secretary read the annual report, which was approved, and ordered to be printed and circulated amongst the members. The Treasurer (Mr. F. N. Cowlin) made his financial statement, which showed the financial condition of the Federation was very good indeed, and that there was a good balance in hand on the year's working. The following gentlemen were duly appointed for the year:—President, Mr. E. Mudge, Exeter; Vice-Presidents, Mr. E. W. Wooster, Bath, and Mr. W. Dowling, Bristol; Treasurer, Mr. F. N. Cowlin, Bristol; Auditors, Messrs. George Humphreys and E. J. Neale, Bristol. The other business of the meeting being concluded, a hearty vote of thanks was accorded on the proposition of Mr. G. J. Long, and seconded by Mr. F. N. Cowlin, to Mr. W. P. Lewis, the retiring President, for so ably carrying out the duties of that office, and for his great interest in the Federation, which had so considerably added to its success. Mr. Lewis, in reply, expressed his thanks for the resolution, and stated how vital it was to employers to organise so that they might be in a position to resist any undue demands from the Trade Unions.

YORK MASTER BUILDERS' AND CONTRACTORS' ASSOCIATION.—The annual dinner of this Association was held recently at the Old George Hotel, Pavement. Mr. R. Dent, President of the Association, presided, and was supported by Mr. George Sharp (Vice-President), Mr. Councillor Mansfield (ex-President), Mr. James Longden (Sheffield), Mr. E. T. Felgate, Mr. S. Needham, and about fifty members and friends. After the loyal toasts were honoured, Mr. George Moss proposed "The Yorkshire Federation of Building Trades' Employers," and Mr. Councillor Mansfield responded. Mr. James Longden proposed "Success to the York Association," to which the President responded. Mr. George Sharp proposed "The City and Trade of York," and Mr. B. Kilvington responded. The other toasts included "The Architects and Surveyors," proposed by Councillor W. H. Birch, and responded to by Mr. E. T. Felgate, and "The Visitors," proposed by Mr. J. Hardgrave, and responded to by Mr. Holgate.

IMPROVEMENTS.—The Improvements Committee reported as follows at the meeting of the London County Council on Tuesday:—"(1) *Richmond-road*, (3) *Battersea Bridge-road, and* (12) *Tooting High-street*.—The Council, on November 17, 1903, decided not to proceed further with the applications to Parliament in respect of the proposed widenings at Richmond-road, at Battersea Bridge-road, and at Tooting High-street. We have communicated with the several local authorities concerned in the remaining schemes with a view to obtaining their consent to the proposed tramways, and also promises to contribute the amounts suggested by the Council towards the cost of the street widenings, and we now report, for the information of the Council, the present position of each improvement. (2) *Edgware-road, etc.*—The St. Marylebone Metropolitan Borough Council dissented from the construction of the tramway. The Pad-

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dington Metropolitan Borough Council has consented to the construction of the tramway, but has declined to contribute any part of the cost of the improvement. The Hampstead Metropolitan Borough Council has also declined to contribute towards the cost of the improvement. The Parliamentary Committee reported on January 26, 1904, that as the necessary consents had not been obtained, the tramway had been dropped. (4) *Wandsworth-common, north side, etc.*—The Battersea Metropolitan Borough Council has consented to the tramway. The Wandsworth Metropolitan Borough Council has consented to the tramway, and has offered, subject to certain conditions, to contribute one-sixth of the cost of the improvement instead of one-third, as required by the Council's resolution. (5) *Streatham High-road.*—The Wandsworth Metropolitan Borough Council objected to the proposed diversion of the tramway along Gleneldon-road, etc., and the Parliamentary Committee reported on January 26, 1904, that the tramway had been dropped. (6) *Malpas-road, etc.*—The Deptford Metropolitan Borough Council has consented to the tramway, and has agreed, subject to certain conditions, to make the necessary contribution. The Lewisham Metropolitan Borough Council has also consented to the tramway, and has agreed to make the necessary contribution. (7) *Lordship-lane.*—The Camberwell and Lewisham Metropolitan Borough Councils have consented to the tramway, and have agreed to make the necessary contributions. (8) *Lewisham High-road, etc.*—The Deptford and Lewisham Metropolitan Borough Councils have consented to the tramway, and have agreed to make the necessary contributions. (9) *Shooter's Hill-road.*—The Greenwich Metropolitan Borough Council has consented to the tramway, but has declined to contribute towards the cost of the improvement. (10) *South-street, etc.*—The Greenwich Metropolitan Borough Council has consented to the tramway, but has declined to make the necessary contribution. The Lewisham Metropolitan Borough Council has consented to the tramway, and has agreed to make the necessary contribution towards the cost of the street widenings in Lewisham. (11) *Basildon-road, etc.*—The Woolwich Metropolitan Borough Council has consented to the tramway, and has agreed to make the necessary contribution."

UNDERGROUND ROOMS IN ST. PANCRAS.—The Public Health Committee of the London County Council reported as follows at Tuesday's meeting of the Council:—"The Council will remember that when inquiry was made in the Metropolitan Borough of St. Pancras by the Medical Officer of Health as to the number of underground rooms illegally occupied as dwellings, it was found that over 400 tenements, affording accommodation for more than 1,000 persons, were occupied separately, although they contravened the provision of the law relating to underground room beginning to be occupied after 1855. As a result of a subsequent inspection of the district, the Borough Medical Officer reported that there were 640 rooms in which the conditions were practically irremediable, and he suggested that these rooms should be dealt with consecutively, and at intervals, 'so as to avoid the serious effects of suddenly displacing a large population.' On December 22 last we reported that the first set of notices, dealing with fifty houses, had been served by the Borough Council on August 7, but pointed out that it was not until December 16 that the question of serving fifty-eight further notices was considered, and we recommended the Council to press the Borough Council to proceed with more rapidity in the matter. The Council adopted our recommendation, and a letter was addressed to the Borough Council expressing the hope that they would give instructions for notices to be served at more frequent intervals so as to secure compliance with the law as soon as reasonably practicable. We are now glad to report that the Borough Council resolved, on January 13, that a further set of notices should be served on the owners of twenty-seven illegally occupied underground rooms, requiring them to discontinue, within four months from the date of the service of the notice, to suffer the rooms to be let or occupied as dwellings contrary to statute. We would, however, again remind the Council that at this rate of progress some years will elapse before these rooms will all have been dealt with."

MEMORIAL STATUE, JARROW.—A statue has been erected in Jarrow to Sir Charles Palmer to commemorate his attainment to his eightieth year. The work consists of a bronze statue of Sir Charles standing on a pedestal, the total height being 26 ft. The sculptor for the work was Mr. Albert T. Toft, whose design was selected in a limited competition, in which Mr. T. Brock acted as assessor. Mr. M. H. Spielmann was retained as technical adviser. The cost of the memorial exceeds 2,000*l.*

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of the undermentioned sanitary inspectors:—Messrs. H. Mettam and T. L. Davies in the City of London, at a salary of 200*l.* per annum each, rising by annual increments of 10*l.* to a maximum salary of 250*l.* Miss F. N. F. Lovibond in Holborn, at a salary of 130*l.* per annum, rising by annual increments of 5*l.* to a maximum salary of 150*l.* Mr. H. King in Lewisham, at a salary of 150*l.* per annum, rising by annual increments of 10*l.* to a maximum salary of 180*l.*

BRISTOL GRAMMAR SCHOOL WAR MEMORIAL.—A memorial has just been completed in Bristol Grammar School in honour of former scholars who took part in the South African war. The memorial takes the form of a brass tablet, mounted on a traceried canopied frame of oak. The work has been carried out by Messrs. Davey and Bushell, sculptors, of St. Michael's Hill.

THE LONDON BUILDING ACT.—At the meeting of Lewisham Borough Council on Wednesday evening the Works and General Purposes Committee reported that they had suggested the following amendments to the London Building Act for the consideration of the Building Act Committee of the London County Council:—

(*a*) That provision should be made for the adjustment of all questions likely to arise between owner, occupier, and ground landlord as regard their respective obligations and liabilities to one another so far as the London Building Act is concerned.

(*b*) That in the case of existing buildings, no hard and fast rule should be laid down, but each building should be dealt with upon its merits according to the circumstances of the case, allowance being made for the character of the construction of existing means of escape and provision for fire extinction.

(*c*) That in all cases under any amendment Bill, the interested parties should be entitled to propose alternative measures, which it shall be the duty of the local authority to consider, with the right in case of disagreement of reference for final decision to a tribunal of appeal to be constituted for the purpose, somewhat similar to that provided for in section 175 of the London Building Act, 1894, or to arbitration.

The report was adopted.

ROYAL ACADEMY.—The following are the dates for sending in works intended for this year's Royal Academy Exhibition:—Water-colours, miniatures, black and white drawings, engravings, etchings, architectural drawings, and all other works under glass—*Friday, March* 25. Oil paintings—*Saturday, March* 26, and *Monday, March* 28. Sculpture—*Tuesday, March* 29. All works must be delivered at the Burlington-gardens entrance.

CAPITAL AND LABOUR.

PLUMBERS' STRIKE, CARDIFF.—During the past few weeks there has been a dispute with the local operative plumbers employed at the Cardiff Municipal Buildings. It appears that a contract was given to a heating engineering firm, and it had come to knowledge that this firm employed others than plumbers to do certain work said to be recognised as plumbers' work. A protest was sent to the firm, and afterwards the plumbers struck work on the new Town Hall and Law Courts. Mr. Lanchester (architect) consented to act as arbitrator in the dispute, and his award stated that Messrs. Ashwell and Nesbitt must, under their contract dated October 30, 1901, employ plumbers for the hot-water services, except in the case of such parts of the work as involved the use of the type of joints known as D. M. Nesbitt's patent joint; and that the stamp duty on the award be paid in equal shares by the two parties. The plumbers have accepted the award, under a protest in regard to the point which mentions D. M. Nesbitt's patent joint, and work has been resumed.—*Western Mail.*

Legal.

DISPUTE AS TO A BUILDING LINE.

MR. JUSTICE BUCKLEY, in the Chancery Division last week, heard the case of the Whitley and Monkseaton Urban District Council *v.* Mulholland, an action by the plaintiffs, the Urban Sanitary Authority of Whitley, Northumberland, against the defendant, Mr. John Mulholland, of Whitley Bay, to restrain him from erecting a building which would, it was said, encroach on the building line prescribed by the plaintiffs under the Public Health Act, 1875. The plaintiffs also asked for an order directing the defendant to pull down the portion already erected.

It appeared that the defendant was the owner of No. 1, Esplanade, and the old Post Office building in Whitley, and he decided to pull down the old buildings on the site and put up a hotel. The west front of the old buildings was towards the Esplanade, and the south frontage towards the Whitley-road. The plaintiffs, in 1903, applied to the Local Government Board for a provisional order to authorise them to widen Whitley-road, and for this purpose to acquire lands on the north side of the road. Plaintiffs did not seek to obtain powers over defendant's property, as they said they intended to rely on sections 154 and 155 of the Public Health Act, 1875, and so prescribe the line of frontage of any buildings to be erected. Plaintiffs accordingly entered into negotiations with the defendant to alter his line of frontage, and to widen the roadway by taking a portion of his land. Plaintiffs, on April 25, 1903, under section 155 of the Act, prescribed the building line running from a point set back 1 ft. 10 in. from the Esplanade, Whitley-road corner, to a point brought forward 4½ in. at the other corner. The plaintiffs further alleged that on the same date they entered into an agreement with the defendant as to this, and also as to the widening of the land taken over and the amount of compensation to be given. Subsequently, finding that the defendant had commenced a building in contravention of these terms, and nearer to the centre of the road, the present action was commenced.

The defendant's case was that in July, 1901, he obtained the plaintiffs' approval to alter part of his buildings, and in 1903 a new line of frontage was marked on a plan prepared by plaintiffs when they were proposing to widen the road and the inquiry was being held by the Local Government Board Commissioners. Defendant's case was that at this time his architect pointed out that the building then in course of erection would exceed the limit. A correspondence took place between the defendant's architect and the plaintiffs' surveyor, and in February the plaintiffs wrote suggesting that defendant should make certain alterations in the original plans, and on March 12 the defendant wrote asking that the new line should be marked on plans. Getting no reply, defendant completed his building. Defendant admitted making a verbal agreement on April 25 with plaintiffs to set back his building, etc., on certain conditions, and this agreement the defendant counterclaimed to set aside on the ground of common mistake.

In the result the parties arrived at a compromise. It was agreed that the building which the defendant was erecting, as it stood, with doors and windows, should remain, and be approved by the plaintiff council, the parties agreeing to an order that a plot of garden land on the Esplanade, in front of the land in question, should be thrown open, and for ever remain an open space. The plaintiffs further agreed to pay the defendant 160*l.* as compensation, each side paying its own costs.

Mr. Buckmaster, K.C., and Mr. R. C. Glen appeared for the plaintiffs; and Mr. Astbury, K.C., and Mr. W. H. Cozens-Hardy for the defendant.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

174 of 1903.—J. RICHMOND and R. F. CAREY: *Appliances for Electrically Controlling Lifts, Hoists, and the like.*

Appliances for electrically controlling lifts, hoists, and the like, consisting in the employment of a motor controlled by a pilot switch, and driving a worm and worm-wheel operating one half of a magnetic clutch in connexion with another half magnetic clutch mounted on the spindle of a main reversing switch and rheostat; the return of the main switch and rheostat, when the pilot switch is operated to stop the working, being effected by a weighted lever attached to a chain or cord, which is fastened at its middle to a wheel, so that said lever will drop suddenly and stop at its lowest position without recoil.

507 of 1903.—R. D. WADDELL: *Ventilators.*

Ventilators which comprise an outlet pipe from the compartment to be ventilated, a trumpet mouth carried by the pipe and arranged to face a current of air and a shield, so arranged within the said trumpet mouth that a space is left between them, while at the same time the edge of the shield projects beyond the rim of the trumpet mouth.

2782 of 1903.—T. CHARTERIS: *Wood Block Flooring.*

This consists in constructing wood blocks for flooring with a dovetail or rabbet, or both, at or near the bottom edges either at the sides or at both sides and ends, and affixing at the ends a metal plate which projects and engages the rabbet or dovetail on one side or end of a neighbouring block to ensure a perfect fixing of the blocks to one another.

2953 of 1903.—T. CHARTERIS: *Wood Block Flooring.*

A wood block flooring which consists in constructing the border blocks from three pieces of wood having an elastic medium between them, the whole being bolted together so as to allow of contraction and expansion of the blocks.

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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4844 of 1903.—F. B. RENDLE: *Means for Glazing Roofs and Structures.*

This consists in the combination of a bearing for the side edges of the sheets of glass to rest on, having a central rib projecting outwards between the sheets of glass, and a head along its outer edge with lips holding on to this head, having projecting stems to pass through the cap to receive nuts or other fastenings to hold down the cap.

4853 of 1903.—J. BOTTERILL: *A Safety Appliance for the Openings or Doorways of Hoists.*

A safety appliance for the openings or doorways of hoists wherin flexible sheeting with transversely arranged bars or rods are secured thereto, the ends of which, or some of which, project beyond the edges of the sheeting and work in guides parallel to the hoist well, is connected to the cage at its top and bottom walls in such wise that the sheeting is caused to close always the opening or doorway of the hoist well, except when the cage is opposite thereto.

4859 of 1903.—A. SCHNEIDER: *Latches or Door Fastenings.*

The subject of the present invention is a bearing for the spindles of latches or door fastenings, which, by rigidly connecting together the two sleeves forming the bearing for the spindle, prevents the handles or knobs of the fastening and the spindle becoming loose, even after it has been some time in use and the door has become warped by drying or from other causes. According to the invention, the sleeves through which the spindle is passed are rigidly connected together by a bow or bent piece. In the free space enclosed by this bow, between the two bearing sleeves is situated the latch or lock, so that the bow embraces the same. The holes in the casing of the door fastening for the spindle are in line with the sleeves.

4978 of 1903.—G. PETERS: *Turf Bricks.*

This relates to the manufacture of turf bricks, and more especially to a process of preparing the turf before bringing it into the brick press. The invention consists in piling up the fresh turf (the water of which may be allowed to pass off in consequence of the weight of the turf) into heaps of about 30 ft. in height, after first reducing the turf into fibres or small pieces. The turf piled up in this way begins to get hot from within the heap, most probably in consequence of processes of oxydation. The quantity of water contained in the turf is, by the heating of the turf, sufficiently reduced to allow the turf to be pressed into bricks. The process has the further advantage that the structure of the bricks manufactured from the turf, treated as above, is more uniform on account of the fibre of the turf becoming much softer by the rotting process taking place. It has been found that neutral turfs, as well as acid turfs, undergo the self-heating process. In case the turf contains too much acid, neutralising means as lye, chalk, or the like, may be added.

7255 of 1903.—J. and M. CRAIG, LTD., and R. HIGHET: *Die Presses for the Manufacture of Tiles.*

A die press for the manufacture of tiles having undercut or dovetail grooves or recesses, consisting in the combination with the bottom die or plunger of spring actuated blocks, whose upper ends project through the die and constitute tongue pieces to form the recesses in the tiles, and whose lower ends project from the ends or sides of the die so as to be acted on by the die box.

22,620 of 1903.—W. INGLIS: *Fixing of Door Handles to their Spindles.*

Under this invention the one handle is secured to the spindle in the usual manner, but the other handle is secured by means of a rack or toothed arrangement on the spindle, which engages with a spring catch fastened to the knob. The spring catch may be so arranged that it automatically grips the rack of the spindle and can be disengaged by pressing on its end which projects out of a hole in the neck of the knob. In order to prevent the socket of the handle wearing, it may be lined with a thin strip of steel, which is held in place by means of a pin.

24,196 of 1903.—H. SPENGLER: *Adjustable Upright for Shoring up Concrete Ceilings and the Supports therefor.*

An adjustable upright for shoring up the supports and bays of concrete ceilings, characterised by the fact that a corbel, adjustable in the manner known, upon an upwardly adjustable shaft, which carries rods, provided with borings or notches upon the plank lining holders, carrying the longitudinally adjustable rods, can be adjusted at various heights and at different distances apart from each other.

24,266 of 1903.—C. PRANGEMIER: *Doors for Chimneys.*

A means for closing the cleaning openings of chimneys towards the interior of buildings or inhabited rooms, comprising in combination a brick of cement, concrete, or clay, containing a step-wise reduced opening; a metal frame secured in the external step of the brick opening; a slide door, movable in guide grooves of the aforesaid frame; a pair of doors connected together by ties turnable in hinges on the frame, said doors adapted to press against the inner steps of the brick opening, and a spring on the door.

24,494 of 1903.—L. M. D. PELLEGRIN and E. P. PETIT: *Construction of Rotatable Houses or other Buildings.*

A rotatable building, consisting in the arrangement in the basement of a fixed conical, vertical, and central part, provided with rings carrying branches, said rings being adapted to rotate on said part, and the branches being suitably connected to channels for distributing various fluids, such as water, gas, and electricity into the building, and discharging at their lower ends into annular channels, into which discharge other longitudinal channels, the evacuation of waste water or sewage being accomplished through the centre of said central part.

25,964 of 1903.—E. PETZHOLTZ: *Hollow Artificial Stones for Building Purposes.*

The process of manufacturing hollow artificial stones, consisting in immersing a collapsible frame corresponding in section to that of the stone desired in the liquid mass of material of which the stone is to be made, withdrawing it, and, after the adhering layer of material is dried, removing it from the latter.

26,356 of 1903.—E. J. DUMVILLE: *A Fire Escape.*

A fire escape comprising a transportable body having sockets and bolts or rods arranged around said sockets; removable poles adapted to be fitted in said sockets when required, and having plates which are adapted to fit over said bolts when the poles are in place, the upper ends of the bolts carrying pulleys, and a sheet or platform arranged to work up and down between the poles, being manipulated by ropes or chains passing over the pulleys at the top ends of the poles.

26,478 of 1903.—C. REINKE: *Artificial Stone.*

Artificial stone composed of four parts of permian limestone, one part of cement, and a suitable, but small, quantity of oxide of magnesium, intimately mixed under addition of the required quantity of water.

26,792 of 1903.—J. H. WILSON: *Electric Sanitary Closets.*

This consists in the combination in a sanitary closet of a bowl, an electric circuit, means for closing said circuit, for example, by the weight of a person using said closet, and a burner arranged in said circuit and forming the pan of said closet, together with a suitable receptacle in which said burner is pivoted, means for discharging the contents of said burner, and a removable drawer in said receptacle below said burner to receive matters discharged from the said burner.

4353 of 1903.—J. KULHANEK: *Construction of Walls and the like.*

A method of wall construction, characterised by the fact that the wall is formed of thin material, such as plates or slabs, which are set in a lattice work, consisting of a system of parallel wires and a system of parallel flat iron bars threaded upon the wires through suitable holes provided for that purpose, and running at right angles to the wires, the said bars being adapted to be freely displaced upon the wires until the courses of slabs, or the like, are laid.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 25.—By FULLER, MOON, & FULLER.

Croydon.—Tamworth-rd., f.g.r. 20*l.*, reversion in 58 yrs £400
St. James's-rd., f.g. rents 44*l.* 2s., reversion in 53 yrs. 1,000
Kenley, Surrey.—Ethel Cottages, &c., f.g.r. 50*l.*, reversion in 90 yrs. 1,125
Tottenham.—Stonebridge-rd., f.g. rents 75*l.*, reversion in 84 yrs. 1,625

January 26.—By CHANCELLOR & SONS.

Fulham.—284, Fulham-rd. (s.), u.t. 59 yrs., g.r. 15*l.*, y.r. 120*l.* 1,610
Twickenham.—Heath-rd., "Grove House" and "Laurel Lodge," area 6 a. 3 r. 7 p., f., p... 8,000
Heath-rd., a freehold building site, 1 a. 3 r. 7 p. 1,480

By EDWARD SIMPSON.

Dulwich.—246, 248, and 250, Underhill-rd., f., w.r. 109*l.* 4s. 1,065
Rotherhithe.—16 and 18, Rotherhithe New-rd., u.t. 44 yrs., g.r. 7*l.* 10s., w.r. 70*l.* 4s. 485

By WALTER VINCENT.

Sydenham.—5, Venner-rd., u.t. 95 yrs., g.r. 10., e.r. 40*l.* 235

By FREDK. WARMAN.

Strand.—10, Buckingham-st. (offices), f., e.r. 150*l.* 8,500
Highbury.—15, Balfour-rd., u.t. 46 yrs., g.r. 6*l.* 6s., y.r. 50*l.* 475
59, 61, and 87, Balfour-rd., u.t. 46 yrs., g.r. 18*l.* 18s., y.r. 132*l.* 1,250
Clapton.—31, 32, 35, and 36, Winslade-rd., u.t. 41 yrs., g.r. 8*l.*, w.r. 106*l.* 12s. 590

By ELEY & SHARP (at Boston).

Boston, Lincs.—Wide Bargate, &c., two freehold shops and houses; also a warehouse, area 860 yds., f., p. 3,750

January 27.—By ARTHUR BARTON.

Walworth.—149 and 151, Westmoreland-rd., u.t. 48 yrs., g.r. 10*l.*, w.r. 70*l.* 4s. 550
22, 23, and 24, Sedan-st., u.t. 46 yrs., g.r. 12*l.*, w.r. 96*l.* 4s. 685

By BRADSHAW, BROWN, & CO.

Poplar.—57, West India Dock-rd. (s.), f., e.r. 45*l.* 480
Belvedere, Kent.—Picardy Manor Way, freehold manufacturing premises, area 1 a. 0 r. 16 p., f., p. 265

By LINNETT & LANE.

Kentish Town.—46, Marsden-st., u.t. 36 yrs., g.r. 11*l.*, w.r. 41*l.* 12s. 175
Camden Town.—34, Prebend-st., u.t. 16 yrs., g.r. 12*l.*, y.r. 30*l.* 113

By STOCKER & ROBERTS.

Forest Hill.—48 and 50, Kilmorie-rd., f., y.r. 68*l.* 975

By R. TIDEY & SON.

Kentish Town.—98, Marsden-st., u.t. 46 yrs., g.r. 5*l.*, y.r. 34*l.* 250

By BROWETT & TAYLOR.

Herne Hill.—6, Half Moon-la., u.t. 93½ yrs., g.r. 10*l.*, y.r. 50*l.* (including mortgage) 440
10, Beckwith-rd., u.t. 93½ yrs., g.r. 10*l.*, y.r. 48*l.* (including mortgage) 420
9, 11, 17, 18, and 20, Elmwood-rd., u.t. 93½ yrs., g.r. 47*l.*, y.r. 228*l.* (including mortgages) 2,000
21, Wyneham-rd., u.t. 93½ yrs., g.r. 8*l.* 10s., y.r. 40*l.* (including mortgage) 310
Teddington.—Cedar-rd., "Oakleigh," "Ashville," "Boxmoor," and "Elmfield," u.t. 91 yrs., gr. 18*l.*, y.r. 106*l.* 1,150

By WYATT & SON (at Chichester).

Aldingbourne, Sussex. — Aldingbourne Mill, Bakery, House, etc., area 4 a. 0 r. 5 p., f., p. 900

January 28.—By NEWBON, EDWARDS, & SHEPHARD.

Soho.—2, Portland-st., f., y.r. 65*l.* 1,350
Islington.—5 and 7, Hanover-st., f., y.r. 76*l.* .. 1,245
Barnsbury.—62 to 78 (even), Copenhagen-st.: also cab yard in rear, f., e.r. 400*l.* 5,170
1 and 2, Francis-st., f., e.r. 60*l.*; also "George the Fourth Tavern," f.g.r. 80*l.*, reversion in 51 yrs. 2,550
3 to 8 Francis-st., f., e.r. 205*l.* 2,825
21, 23, and 25, Pulteney-st., and 9 to 12, Francis-st., f., e.r. 200*l.* 2,360
27 to 49 (odd), Pulteney-st.; also "Broughton Cottage," f., e.r. 400*l.* 5,360

By VARLEY & LOCKING.

Kingsland.—65, Alvington-cres., u.t. 62 yrs., g.r. 7*l.*, e.r. 48*l.* 360
Bethnal Green.—15, Quilter-st., u.t. 18¼ yrs., g.r. 4*l.* 10s., w.r. 39*l.* 130
Kentish Town.—35, Torbay-st., u.t. 33½ yrs., g.r. 5*l.*, y.r. 27*l.* 210

By WYER, ADAMS, & GLOVER, with HARLAND & SON (at High Barnet).

High Barnet, Herts.—Marriott-rd., "Parkhurst," u.t. 82½ yrs., g.r. 8*l.*, y.r. 40*l.* 475

By NEWELL & HAMLYN (at New Cross).

New Cross.—48 and 50, Kerry-rd., u.t. 58 yrs., g.r. 8*l.* 5s., w.r. 57*l.* 4s. 435
Deptford.—16, Alverton-st., u.t. 40 yrs., g.r. 2*l.* 2s., w.r. 29*l.* 18s. 255
30, 32, and 34, Addey-st., u.t. 21 yrs., g.r. 4*l.*, w.r. 40*l.* 19s. 135
Greenwich.—2 to 26 (even), Caradoc-st., u.t. 5½ yrs., g.r. 35*l.*, w.r. 249*l.* 12s. 110
6, Thornham-st., u.t. 39½ yrs., g.r. 1*l.* 10s., w.r. 22*l.* 10s. 180
3 and 11, Woodland-gr., u.t. 34½ yrs., g.r. 3*l.* 16s. 3d., w.r. 35*l.* 2s. 160
3 and 4, Morden-gr., u.t. 40½ yrs., g.r. 9*l.* 11s., q.r. 52*l.* 120
126, Greenwich-rd., u.t. 39½ yrs., g.r. 7*l.*, q.r. 45*l.* 335
New Charlton.—117 and 119, East-st. (s.), u.t. 41 yrs., g.r. 8*l.*, q.r. 53*l.* 260

January 29.—C. RAWLEY CROSS & CO.

Shepherd's Bush.—88, St. Stephen's-av., u.t. 71½ yrs., g.r. 5*l.* 5s., e.r. 42*l.* 400
Surbiton.—83 and 84, Cleaveland-rd., with laundry premises in rear, u.t. 61 yrs., g.r. 8*l.*, y.r. 66*l.* 550

By LEOPOLD FARMER & SONS.

New Cross.—47, St. Donnett's-rd., u.t. 60½ yrs., g.r. 4*l.* 10s., y.r. 38*l.* 410

By W. B. HALLETT.

Dalston.—20, 32, and 34, Buckingham-rd., u.t. 69 yrs., g.r. 27*l.* 5s., y.r. 94*l.* 4s. 740

By TYSER, GREENWOOD, & CRIER.

Hounslow, Middx.—1, 2, and 3, Clifton Villas, f., w.r. 70*l.* 4s. 775
1, Albert Villas (s.), area ¼ acre, f., y.r. 24*l.* .. 495

By WAGSTAFF & SONS.

Wood Green.—122, Lordship-la., f., e.r. 70*l.* 1,000
Hackney.—82 and 84, Devonshire-rd., u.t. 43½ yrs., g.r. 10*l.*, y.r. 64*l.* 555

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

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PUBLISHER'S NOTICES.

...e. Tel., 6113, Gerrard. Telegrams, "The Builder, London."

E INDEX (with TITLE-PAGE) for VOLUME LXXXV. (July to December, 1903) was given as a supplement with issue of January 9 last.

...TH CASES for Binding the Numbers are now ready price 2s. 6d. each; also

...ADING CASES (Cloth), with Strings, price 9d. each.

...E EIGHTY-FIFTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

...SCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

...MPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY ...RPORATE BODIES, COUNTY AND OTHER COUNCILS, ...OSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, &c., &c.

Six lines, or under ..... 6s. 0d.
Each additional line ..... 1s. 0d.

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...erms for series of Trade advertisements, and for front page, ...l other special positions, on application to the Publisher.

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FOUR lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps must not be sent, but all sums should be remitted by ...stal Orders, payable to J. MORGAN, and addressed to the ...blisher of "THE BUILDER," Catherine Street, W.C.

...dvertisements for the current week's issue are received up to ...REE o'clock p.m. on THURSDAY, but "Classification" is ...possible in the case of any which may reach the Office after ...ALF-PAST ONE p.m. on that day. Those intended for the ...tside Wrapper should be in by TWELVE noon on WEDNES-...AY.

...ALTERATIONS IN STANDING ADVERTISEMENTS or ...DERS TO DISCONTINUE same must reach the Office before ...N o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTI-...ONIALS, &c., left at the Office in reply to advertisements, and ...rongly recommends that of the latter COPIES ONLY should be ...nt.

PERSONS advertising in "THE BUILDER" may have *Replies addressed to the Office, free of charge.* Letters will be forwarded if addressed envelopes are sent, ...ether with sufficient stamps to cover the postage. Unused ...amps are returned to advertisers the week after publication.

...AN EDITION Printed on THIN PAPER, for FOREIGN and ...OLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

MEETINGS.

FRIDAY, FEBRUARY 5.

Architectural Association.—Mr. W. A. Harvey on Cottage Homes." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. ...J. Steegmann on "Elementary Chemistry," I. 7 p.m.

Junior Institution of Engineers (Westminster Palace ...otel).—Mr. Hal Williams on "Producer Gas for ...actory, Cold Stores, and Freezing Works." 8 p.m.

SATURDAY, FEBRUARY 6.

Sanitary Inspectors' Association.—Twenty-first Annual ...inner, Venetian Chamber, Holborn Restaurant. ...30 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers). ...Inspection at Charing Cross Hospital New Buildings. ...15 p.m.

Incorporated British Institute of Certified Carpenters. ...Monthly meeting, Carpenters' Hall. Mr. W. Middleton ...ill open a discussion upon "Failures in Carpentry and ...oinery." 6 p.m.

Architectural Association.—Second spring visit, to ...o. 11, Hill-street, Berkeley-square, and No. 9, Hyde ...ark-terrace, W.

MONDAY, FEBRUARY 8.

Surveyors' Institution.—Discussion will be resumed on ...he paper by Mr. Ralph Neville, K.C., entitled "The ...arden City Scheme and First Garden City, Limited." ...p.m.

Institution of Mechanical Engineers (Graduates' Meeting).—Mr. W. H. Merrett on "The Work of the Alloys ...esearch Committee," illustrated.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. ...J. Steegmann on "Elementary Chemistry," II. ...p.m.

Regent-street Polytechnic (University Extension ...ectures).—Prof. Vivian B. Lewes on "The Chemistry of ...ir, Fire, and Water," II. 8 p.m.

Glasgow Philosophical Society (Architectural Section).—...Mr. J. Maurice Arthur on "Legal Points Relative to ...uildings." 8 p.m.

TUESDAY, FEBRUARY 9.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Dr. J. Priestley, B.A., on ...Sanitary Law," I. 7 p.m.

Institution of Civil Engineers.—Mr. H. H. West on ...Tonnage Laws, and the Assessment of Harbour Dues ...nd Charges." 8 p.m.

WEDNESDAY, FEBRUARY 10.

Sanitary Institute.—Discussion on "Road Sanitation," ...o be opened by Mr. J. Patten Barber, M.Inst.C.E. (Borough Engineer and Surveyor, Islington), and Dr. Louis C. Parkes, M.D., D.P.H. (Medical Officer of Health, Chelsea, Consulting Sanitary Adviser to H.M. Office of Works). The chair will be taken at 8 p.m. by Lord Monkswell, Chairman of the London County Council.

Society of Arts.—Mr. C. Vernon Boys, F.R.S., on ...Thermit: Its Application to Metallurgical Engineering." 8 p.m.

Northern Architectural Association.—Mr. W. H. Wood on "Fifteenth Century Architecture." 7.30 p.m.

Edinburgh Architectural Association (Associates' Paper). ...Mr. C. Mackie, A.R.S.A., on "Common Sense in Art." ...8 p.m.

THURSDAY, FEBRUARY 11.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, B.A., on "Sanitary Law," I. 7 p.m.

Leeds and Yorkshire Architectural Society.—Papers: "Registration as Affecting Architecture and Architects," by Prof. Beresford Pite and Mr. W. H. Seth-Smith. 6.30 p.m.

Institution of Electrical Engineers.—Prof. R. M. Walmsley, D.Sc., on "Transatlantic Engineering Schools and Engineering." 8 p.m.

FRIDAY, FEBRUARY 12.

Royal Institution.—Very Rev. J. A. Robinson, Dean of Westminster, on "Westminster Abbey in the Early Part of the Seventeenth Century." 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, B.A., on "Sanitary Law," II. 7 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. J. Jeffrey Waddell on "City Architecture." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. T. S. Nash on "The Electricity and Destructor Station at Plumstead." 8 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks.....	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles.....	1 13 0	„ „ „
Facing Stocks ...	2 12 0	„ „ „
Shippers	2 10 0	„ „ „
Flettons	1 10 0	„ at railway depôt
Red wire Cuts ..	1 13 0	„ „ „
Best Fareham Red	3 12 0	„ „ „
Best Red Pressed Ruabon Facing	5 0 0	„ „ „
Best Blue Pressed Staffordshire ..	4 4 0	„ „ „
Do. Bullnose	4 10 0	„ „ „
Best Stourbridge Fire Bricks....	4 8 0	„ „ „
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	„ „ „
Headers	12 0 0	„ „ „
Quoins, Bullnose, and Flats	17 0 0	„ „ „
Double Stretchers	19 0 0	„ „ „
Double Headers..	16 0 0	„ „ „
One Side and two Ends	19 0 0	„ „ „
Two Sides and one End	20 0 0	„ „ „
Splays, Chamfered, Squints .	20 0 0	„ „ „
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	„ „ „
Quoins, Bullnose, and Flats	14 0 0	„ „ „
Double Stretchers	15 0 0	„ „ „
Double Headers..	14 0 0	„ „ „
One Side and two Ends	15 0 0	„ „ „
Two Sides and one End	15 0 0	„ „ „
Splays, Chamfered, Squints..	14 0 0	„ „ „
Second Quality White and Dipped Salt Glazed	2 0 0	„ less than best.
	s. d.	
Thames and Pit Sand.....	7 3	per yard, delivered.
Thames Ballast	6 0	„ „
Best Portland Cement	29 0	per ton, „
Best Ground Blue Lias Lime	20 6	„ „

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fire Clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington depôt.....	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms depôt	1 8½	„ „
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf..	2 1	„ „
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf ..	2 2½	„ „
	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer in blocks	1 6	„ „
Greenshill „	1 10	„ „
Darley Dale in blocks ..	2 4	„ „
Red Corsehill „	2 5	„ „
Closeburn Red Freestone	2 0	„ „
Red Mansfield „	2 4	„ „

YORK STONE—*Robin Hood Quality.*

	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. r y. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. „
6 in. rubbed two sides ditto, ditto	2 6	„ „
3 in. sawn two sides slabs (random sizes)	0 11½	„ „
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	„ „

STONE—(*continued*)—

YORK STONE.—*Robin Hood Quality*—(*continued*)—

1½ in. to 2 in. ditto, ditto	0 6	„ „
HARD YORK—		
Scappled random blocks	3 0	per ft. cube „
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. „
6 in. rubbed two sides Ditto	3 0	„ „
3 in. sawn two sides slabs (random sizes)	1 2	„ „
2 in. self-faced random flags	0 5	„ „
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
„ 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depot.
„ 3 in do.	1 2½	„ „

SLATES.

in. in.	£ s. d.	
20 x 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d
20 x 12 „ „	13 17 6	„ „
20 x 10 best seconds „	12 15 0	„ „
20 x 12 „ „ „	13 10 0	„ „
16 x 8 best „ „	7 0 0	„
20 x 10 best blue Portmadoc	12 12 6	„ „
16 x 8 best blue Portmadoc	6 12 6	„ „
20 x 10 best Eureka unfading green ..	15 2 6	„ „
20 x 12 best Eureka unfading green ..	17 2 6	„ „
18 x 10 „ „	12 10 0	„ „
16 x 8 „ „	10 5 0	„ „
20 x 10 permanent green	11 10 0	„ „
18 x 10 „ „	9 10 0	„ „
16 x 8 „ „	6 10 0	„ „

TILES.

	s. d.	
Best plain red roofing tiles ..	42 0	per 1000 at rly. depot.
Hip and Valley tiles ..	3 7	per doz. „ „
Best Broseley tiles.....	50 0	per 1000 „ „
Do. Ornamental tiles	52 6	„ „ „
Hip and Valley tiles ..	4 0	per doz. „ „
Best Ruabon red, brown or brindled do. (Edwards)	57 6	per 1000 „ „
Do. Ornamental do.	60 0	„ „ „
Hip tiles	4 0	per doz. „ „
Valley tiles	3 0	„ „ „
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 „ „
Do. Ornamental do.	54 6	„ „ „
Hip tiles	4 1	per doz. „ „
Valley tiles	3 8	„ „ „
Best "Rosemary" brand plain tiles	48 0	per 1000 „ „
Best Ornamental tiles	50 0	„ „ „
Hip tiles	4 0	per doz. „ „
Valley tiles	3 8	„ „ „
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000 „ „
Do. pressed	47 6	„ „ „
Do. ornamental, do.	50 0	„ „ „
Hip tiles	4 0	per doz. „ „
Valley tiles.....	3 6	„ „ „

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	15 10 0	16 10 0
Deals: best 3 by 9.....	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	„ „ „
2 in. by 4 in. and 2 in by 6 in. ..	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in...	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.....	0 10 0	more than battens.
½ in.....	1 0 0	„
Fir timber: best middling Dantzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)....	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)..	3 5 0	3 15 0
JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in.....	23 0 0	24 0 0
3 in. by 9 in.....	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.....	18 10 0	20 0 0
„ „ 3 in by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.....	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.....	18 0 0	19 10 0
Battens.....	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.....	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.....	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in..	14 10 0	15 10 0
„ „ 3 in. by 9 in..	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
„ „ 3 in. by 9 in.	12 10 0	13 10 0
„ „ battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra.....	0 10 0	1 0 0
Yellow Pine—First, regular sizes	33 0 0	upwards.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube ..	0 3 6	0 4 6

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WOOD—(*continued*)—

JOINERS' WOOD.—(*Contd.*)	At per standard. £ s. d.	£ s. d.
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
½ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot	0 11 6	0 1 6
1 in. by 7 in. white, planed and matched	0 12 0	0 14 0
1¼ in. by 7 in. white, planed and matched	0 14 6	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ..	7 5 0
Compound Girders, ordinary sections	8 2 6 ..	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ..	8 17 6
Flitch Plates	8 5 0 ..	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ..	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 10 0 ..	8 0 0
Staffordshire Crown Bars, good merchant quality	8 0 0 ..	8 10 0
Staffordshire "Marked Bars"	10 10 0 ..	—
Mild Steel Bars	8 15 0 ..	9 5 0
Hoop Iron, basis price	9 5 0 ..	9 10 0
" galvanised	17 10 0 ..	—

(*And upwards, according to size and gauge.)

Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ..	—
" " 24 g.	10 15 0 ..	—
" " 26 g.	12 5 0 ..	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 8 ft. to 20 g.	12 15 0 ..	—
Ordinary sizes to 22 g. and 24 g	13 5 0 ..	—
" " 26 g.	14 5 0 ..	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ..	—
" " 22 g. and 24 g.	16 10 0 ..	—
" " 26 g.	18 0 0 ..	—
Galvanised Corrugated Sheets—		
Ordinary sizes, 6 ft. to 8 ft. 20 g	12 15 0 ..	—
" " 22 g. and 24 g.	13 5 0 ..	—
" " 26 g.	14 0 0 ..	—
Best Soft Steel Sheets, 6ft. by 2ft. to 3 ft. by 20 g. and thicker	11 15 0 ..	—
Best Soft Steel Sheets, 22 g. & 24 g	12 15 0 ..	—
" " " 26 g	14 0 0 ..	—
Cut nails, 3 in. to 6 in.	9 5 0 ..	9 15 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 5 0 ..	—
Pipe in coils	14 15 0 ..	—
Soil pipe	17 5 0 ..	—
Compo pipe	17 5 0 ..	—
ZINC—Sheet—		
Vieille Montagne ton	26 5 0 ..	—
Silesian	26 0 0 ..	—
COPPER—		
Strong Sheet per lb.	0 0 10½ ..	—
Thin "	0 0 11½ ..	—
Copper nails "	0 0 11 ..	—
BRASS—		
Strong Sheet per lb.	0 0 10 ..	—
Thin "	0 0 11 ..	—
TIN—English Ingots "	0 1 5 ..	—
SOLDER—Plumbers' "	0 0 6½ ..	—
Tinmen's "	0 0 8 ..	—
Plowpipe "	0 0 9 ..	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft. delivered
" fourths	1½d. " "
21 oz. thirds	3d. " "
" fourths	2½d. " "
26 oz. thirds	3½d. " "
" fourths	3d. " "
32 oz. thirds	4½d. " "
" fourths	4d. " "
Fluted sheet, 15 oz.	2½d. " "
" 21 oz.	3½d. " "
½ Hartley's Rolled Plate	1½d. " "
½ " " "	2d. " "
¾ " " "	2½d. " "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 7
" " in drums	"	0 1 10
Boiled " in pipes or barrels	"	0 1 10
" " in drums	"	0 2 1
Turpentine, in barrels	"	0 3 10
" in drums	"	0 4 0
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	"	19 0 0
Best Linseed Oil Putty	per cwt.	0 7 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BANSTEAD.—For additions to Wingfield, Banstead, for Mr. C. S. Knight. Mr. H. Knight, architect, 75, Aldermanbury, E.C.:—

Wheatley & Sons £986

BEIGHTON (Yorks).—For the erection of stores and house, for the Handsworth and Woodhouse Industrial Co-operative Society, Ltd. Mr. H. L. Paterson, architect, 19, St. James's-street, Sheffield:—

Excavator, Mason, and Bricklayer: John Grant, Mosbro', near Sheffield*	£660 0 0
Carpenter and Joiner: William Turner, Woodhouse, near Sheffield*	319 0 0
Slater: R. Wragg & Son, Chesterfield*	45 11 8
Plasterer: F. & D. Vernon & Son, Beighton, near Sheffield*	51 0 0
Plumber and Glazier: Braithwaite & Co., Leeds and Sheffield*	51 0 0
Painter: R. M. Jones, Sheffield*	29 4 0

BIRKENHEAD. — For sewering, making, etc., Canterbury-road, between New Chester-road and Chatham-road; part Rochester-road and part Albert-road, for the Corporation. Mr. Charles Brownridge, Borough Engineer, Town Hall, Birkenhead:—

C. L. Warren, St. Paul's-road, Seacombe, accepted for ..... { Albert-road .... £293 12 6; Canterbury-road 276 0 0; Rochester-road . 56 2 5

BISHOP'S STORTFORD. — For alterations and painting to workhouse chapel, for the Guardians. Mr. John Laybank Glasscock, architect:—

A. Franklin .. £163 0 0 | J. R. Taylor & Sons* £137 17 0
H. Champness 156 19 0 |

[All of Bishop's Stortford.]

BLAKEDOWN (Worcester).—For about 2,000 yards of pipe sewers, etc., and of bacterial disposal works at Blakedown, for the Bromsgrove Rural District Council. Mr. H. W. Taylor, A.M.Inst.C.E., St. Nicholas-chambers, Newcastle-on-Tyne:—

Meredith Bros.	£3,004 0 0
H. Roberts	2,424 0 0
George Holloway	2,303 0 0
Kellett & Co.	2,268 0 0
Waring & Sons	2,108 0 0
T. A. Meredith	2,081 0 0
Johnson Bros.	2,056 0 0
Currall, Lewis, & Martin	2,032 0 0
Vale & Sons	1,984 0 0
Byard & Sons	1,962 0 0
Morley & Sons	1,911 0 0
J. Jameson	1,900 0 0
George Law	1,897 0 0
Johnson & Langley	1,877 0 0
Willetts & Sons	1,835 0 0
A. B. & W. J. Tilt, Birmingham-road, Bromsgrove*	1,760 0 0

BOSTON (Lincs.).—For supply of granite and slag for the Rural District Council:—

Granite.

L. Roper, 70, High-street, Boston	7,142 tons.
L. Sommerfeld, King's Lynn	750 do.

Slag.

Holwell Iron Co., Asfordby, Melton Mowbray	3,891 do.

BRADWELL-ON-SEA.—For six workmen's cottages, for the Maldon Rural District Council. Mr. H. G. Keywood, surveyor, Maldon, Essex:—

Wakelin	£2,250 0 0
Cardnell & Dowsett	1,690 0 0
C. Read	1,668 0 0
Myall & Upson	1,592 0 0
Hy. Potter & Sons	1,500 0 0
W. Gladwell, jun.	1,474 0 0
J. Rayner, East Hanningfield*	1,310 0 0

BRIDLINGTON.—For new business premises in Clough Bridge, for Mr. H. Taylor. Messrs. Brodrick, Lowther, & Walker, architects, Central Chambers, Bridlington:—

J. Rennard	£747 6 4
J. H. Hudson	608 10 0
E. Corner	607 10 0
Smallwood & Shaw	550 2 10
G. Storr & Son	549 0 0
J. R. Stork	518 19 0
W. Hoggard	506 18 6
A. Gardam, Marshall-avenue*	504 10 0
A. A. Booth	501 19 0
Sampson & Siddall	500 18 0

[All of Bridlington].

CHESHUNT.—For sewage disposal works, for the Urban District Council. Messrs. Pollard & Tingle, engineers, 31, Old Queen-street, Westminster:—

Thomas W. Pedrette	£994 17 3
James Dickson	920 0 0
S. Kind	920 0 0
Johnson & Langley	907 19 0
H. Williams	886 11 2
A. Fasey & Son	835 0 4
G. Bell	831 0 0
A. T. Catley	808 0 0
Gronnas & Newton	770 15 3
M. S. Kitteringham, Waltham Cross*	725 0 0

CLAYGATE (Surrey).—For twelve cottages, Claygate, Surrey. Mr. H. Knight, architect, 75, Aldermanbury, E.C.:—

Higby & Rabson £2,400

CLAYGATE.—For three pairs of semi-detached villas, Claygate, Surrey. Mr. H. Knight, architect, 75, Aldermanbury, E.C.:—

Higby & Rabson £3,000

CLAYGATE.—For three pairs of semi-detached villas, Claygate, Surrey. Mr. H. Knight, architect, 75, Aldermanbury, E.C.:—

Wheatley & Sons £3,600

EASTBOURNE.—For 100 tons of flints, for the Guardians of the Eastbourne Union:—

Hall & Co., Croydon Ltd. ..... £0 8 9 | James Wood & Son, Polegate* £0 7 6
Seward Brock .... 0 8 0 |

GRAYS (Essex).—For alterations and additions to premises Nos. 18 and 20, High-street, Grays, for Mr. C. Mitcham. Mr. Christopher M. Shiner, architect, 6, 7, and 8, Crutched-friars, E.C.:—

J. J. Lawrence, Grays	£1,525
G. Brown, Grays	1,517
E. West, Chelmsford	1,470
J. S. Hammond & Son, Romford	1,453
T. Bruty, Hornchurch	1,377

GRIMSBY.—For the erection of residence, Grimsby, for Mr. C. Bellamey. Mr. Herbert C. Scaping, architect, Court-chambers, Grimsby. Quantities by Mr. J. Watson, Hull:—

Cartledge & Waterman	£1,813 2 6
Wilkinson & Houghton	1,802 0 0
Hewins & Goodhand	1,800 0 0
H. Marrows	1,796 0 0
Gilbert & Kirton	1,791 2 6
J. Markwell Holmes	1,789 5 0
G. & J. Smith	1,785 10 0
W. Ion	1,776 2 1
J. H. Thompson & Sons*	1,750 0 0

GRIMSBY.—For fixtures and furniture at the police extensions, Town Hall, Grimsby. Mr. H. Gilbert Whyatt, A.M.Inst.C.E., Borough Engineer:—

E. B. Trafford	£365 2 0
North of England Furnishing Co.	360 16 2
Rands & Lindup	343 4 0
Unity Wood & Iron Company	330 0 0
H. Kaye	324 0 0
White	322 5 8
J. Hogg	290 0 0
B. W. Smith	284 13 2
Wellington Furnishing Co.	280 0 0
T. R. Waterman, Grimsby*	278 19 0

HAILSHAM (Sussex).—Accepted for the supply of materials for the Rural District Council:—

	Granite. Per yard. s. d.	s. d.	s. d.
Hall & Co., Eastbourne	12 4½	12 6½	12 7½
F. A. Hughes & Co., Greenwich	12 6	—	—
Stone.			
Wm. Hudson, Brighton	9 10	10 1	10 3
Constable, Hart, & Co., Tovil, Maidstone	10 0	—	—
W. H. Bensted & Son, Maidstone	9 6	—	
Mendip Granite & Asphalte Co., Cranmore, Shepton Mallet	11 0	—	—
Chittenden & Simmons, West Malling	9 3	10 3	10 8
F. A. Hughes & Co., Greenwich	10 4	—	—
Flints.			
Hall & Co., Croydon	6 7	—	—
Gravel.			
Somerset Fullers Earth & Ochre Co., Emboro', Bath	s. d. 12 0 per t		
Hall & Co., Croydon	5 7 do		
William Hudson, Brighton	6 8 do		
Clinkers.			
William Hudson, Brighton	5 6 d		

HODDESDON (Herts).—For pitching, kerbing, footpaths, for the Hertfordshire County Council. Urban A. Smith, County Surveyor, Hatfield:—

M. S. Ketteringham	£399 14
Free & Sons	332 2
A. T. Catley	322 0
Griffith & Co.	312 18
W. Andrews	311 5
W. H. Wheeler	307 18
Wallace & Inns	307 1
Nowell & Sons	301 19
J. Jackson, Forest Gate*	299 17

LONDON.—For the provision of heating appara the Lots-road pumping station, for the London C Council:—

Clements, Jeakes, & Co.	£200 0
Clark, Hunt, & Co.	147 10
London Warming and Ventilating Co., Ltd.	144 10
Comyn Ching & Co., Ltd.*	138 0

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LONDON SCHOOL BOARD TENDERS.

e following lists of Tenders were submitted by the
s Committee of the London School Board at
sday's meeting of the Board. Mr. T. J. Bailey is
Board's Architect:—

or-lane Site, Lee, for Three Brick Buildings for Temporary Accommodation.

Mitson & Harrison	£4,716 10 0
W. Harris	4,488 0 0
Holliday & Greenwood, Ltd.	4,366 0 0
J. Smith & Sons, Ltd.	4,320 0 0
H. Groves	4,315 0 0
T. D. Leng	4,297 0 0
Thomas & Edge	4,272 0 0
F. & H. F. Higgs	4,270 0 0
E. Lawrance & Sons	4,254 0 0
J. Appleby & Sons	4,220 0 0
W. Downs	4,193 0 0
E. P. Bulled & Co.	4,159 0 0
J. & C. Bowyer*	4,045 0 0

nett-road Site, Battersea, for Erection of School for Physically Defective Children.

eral Builders, td.	£5,370	W. Johnson & Co., Ltd.	£4,499
impson & Son	5,091	W. Akers & Co.	4,465
ie & Co., Ltd.	4,900	Holloway Bros, Ltd.	4,463
asure & Son	4,690	Stimpson & Co.	4,360
lson Bros.	4,678	E. P. Bulled & Co.	4,344
hey Bros.	4,655	E. Triggs	4,296
Smith & Sons, td.	4,579	J. Garratt & Son*	4,257
		Edwards & Medway	3,578

ssy-road Site, Catford, for Special School for Sixty Mentally Defective Children.

F. G. Minter	£4,133 0 0
Rice & Son	3,743 0 0
J. Garratt & Son	3,664 0 0
Edwards & Medway	3,649 17 0
Thomas & Edge	3,633 0 0
E. P. Bulled & Co.	3,554 0 0
T. D. Leng	3,498 0 0
J. & C. Bowyer	3,487 0 0
J. Appleby & Sons	3,310 0 0
W. Akers & Co.*	3,141 0 0

pland-street Site, Lisson-grove, for Enlarging Deaf Centre, etc.

J. Simpson & Son	£2,711 0 0
F. Gough & Co.	2,652 0 0
G. Neal	2,642 0 0
Marchant & Hirst	2,615 0 0
H. Wall & Co.	2,487 0 0
J. Wilmott & Sons	2,474 0 0
G. S. S. Williams & Son	2,429 0 0
General Builders, Ltd.	2,312 0 0
Stevens Bros.	2,296 0 0
Treasure & Son	2,286 0 0
L. H. & R. Roberts*	2,273 0 0
J. Allen & Sons, Ltd.	2,035 10 0

'owlem-street School, Cambridge Heath, for Sanitary and Drainage Works.

. Lawrance & Sons	£3,258	L. H. & R. Roberts	£2,888
. S. S. Williams & Son	3,144	J. Peattie	2,878
. Porter	3,084	Ashby & Horner	2,871
. P. Beattie	2,968	J. W. Falkner & Sons	2,867
tevens Bros.	2,895	F. Bull	2,856
. Willmott & Sons	2,895	McCormick & Sons*	2,491

Hither Green" School, Lewisham, for Re-fitting Offices, etc.

. Groves	£902	J. W. Falkner & Sons	£723
olliday & Green-wood, Ltd.	895	G. Parker	695
. Downs	850	Maxwell Bros., Ltd.	680
athey Bros.	800	J. & C. Bowyer	668
		H. Leney & Son*	500

'averstock-hill School, St. Pancras, for Re-fitting Offices, etc.

T. Cruwys	£398 0 0
C. Dearing & Son	366 0 0
Barrett & Power	359 3 0
J. Peattie	358 0 0
Stevens Bros.	358 0 0
C. W. Killingback & Co.	342 0 0
Marchant & Hirst	329 0 0
F. Bull*	329 0 0

'rincess May-road Site, Stoke Newington, for Adapting House, No. 44, Barrett's-grove, for occupation of Schoolkeeper.

F. W. Harris	£520 0 0
A. Porter	513 0 0
Bate Bros.	470 0 0
W. Silk & Son	457 0 0
C. Willmott & Son	425 0 0
Woollaston Bros.*	387 10 0

Cable-street Site, St. George's-in-the-East, for Adaptation of House, No. 210, Cable-street, for use as Housewifery Centre.

Barrett & Power	£497 0 0
Vigor & Co.	474 0 0
Parrott & Isom	439 0 0
G. Barker	404 0 0
J. T. Robey	370 0 0
A. J. Sheffield	363 0 0
J. Haydon & Sons*	315 12 0

William-street Site, Hammersmith, for Adaptation of No. 1, Gordon-cottages, for use as Housewifery Centre.

G. Neal	£367	Lathey Bros.	£329
W. Hammond	360	General Builders, Ltd.	287
E. Triggs	346	S. Polden	265
R. S. Ronald	335	E. B. Tucker*	258
J. Garrett & Son	331		

Beaufort House New School, Fulham, for Heating Apparatus.

G. Davis	£850 0 0
H. C. Price Lea & Co.	845 0 0
R. H. & J. Pearson Ltd.	737 0 0
J. Richmond & Co., Ltd.	711 0 0
J. Wontner-Smith, Gray, & Co.	692 0 0
Brightside Foundry & Engineering Co., Ltd.	670 0 0
B. Harlow & Son	647 0 0
Comyn Ching & Co., Ltd.	646 10 0
Bates & Sons	640 0 0
J. Defries & Sons, Ltd.*	621 0 0

Childerley-street Higher Grade School, Fulham, for Heating Apparatus.

G. Davis	£820 0 0
J. & F. May	645 0 0
C. Kite & Co.	599 0 0
B. Harlow & Son	567 0 0
Brightside Foundry and Engineering Co., Ltd.	545 0 0
Wipple Bros. & Row	545 0 0
J. Richmond & Co., Ltd.	530 4 0
G. & E. Bradley*	491 0 0

Blackheath-road new Higher Elementary School, for Heating Apparatus.

J. Esson & Son	£850 0 0
W. G. Cannon & Sons	599 0 0
J. & F. May	564 0 0
R. H. & J. Pearson, Ltd.	534 0 0
J. Wontner-Smith, Gray, & Co.	478 10 0
B. Harlow & Son	470 0 0
C. Kite & Co.	465 0 0
G. & E. Bradley*	421 0 0

Cromer-street School, Brunswick-square, for Heating Apparatus.

G. Davis	£596 0 0
J. Esson & Son	385 0 0
W. G. Cannon & Sons	368 0 0
Werner, Pfleiderer, & Perkins, Ltd.	301 2 5
J. Sloper & Co.	298 17 6
Bates & Sons	298 0 0
Palowkar & Sons	294 0 0
J. Wontner-Smith, Gray, & Co.	284 10 0
R. Clarke	280 0 0
G. & E. Bradley*	251 0 0

The "Millbank" School, Westminster, for Heating Apparatus for Enlargement.

C. Kite & Co.	£75 0 0
W. Simmons	68 6 0
B. Harlow & Son	68 0 0
J. Esson & Son	58 6 0
J. Richmond & Co., Ltd.	45 16 9
Comyn Ching & Co., Ltd.	44 10 0
G. & E. Bradley	43 10 0
J. Wontner-Smith, Gray, & Co.	42 0 0
R. H. & J. Pearson, Ltd.*	42 0 0

For Repairing Desks, etc., at the Furniture Stores in Broadwall, Blackfriars.

H. J. Williams	£414 0 0
W. Martin	286 10 0
E. Spencer & Co.	213 17 0
G. M. Hammer & Co., Ltd.	200 0 0
T. Cruwys	197 0 0
London School Furniture Co.	190 0 0
H. Bouneau*	150 0 0

LONDON.—For Bolton's Library, Knightsbridge, for the Exors. of the late Mrs. Calliard. Mr. H. Knight, architect, 75, Aldermanbury, E.C.:—

Turtle & Appleton £5,100

LONDON. — For rebuilding The Three Crowns, public-house, Old Jewry, E.C., for Miss J. Fry. Mr. H. Knight, architect, 75, Aldermanbury, E.C.:—

J. Nicks & Co. £3,410

LONDON. — For alterations to The Victoria public-house, Snow-hill, Smithfield, E.C., for the Exors. of the late S. H. Baker. Mr. H. Knight, architect, 75, Aldermanbury, E.C.:—

Inkpen & Co. £890

LONDON.—For alterations to The Bishopsgate restaurant, Old Broad-street, for R. Charles & Co. Mr. H. Knight, architect, 75, Aldermanbury, E.C.:—

Adamson & Sons £950

LONDON.—For additions to Nos. 434 and 436, Brixton-road, for Messrs. Quinn & Axtens. Mr. H. Knight, architect, 75, Aldermanbury, E.C.:—

J. Nicks & Co. £2,186

LONDON.—For paving of footways on Section A., Totterdown-fields Estate, Tooting, for the London County Council:—

C. W. Killingback & Co.	£2,085 3 6
G. Wilson	1,662 5 4
The Adamant Stone Paving Co.	1,577 0 0
The Victoria Stone Co.	1,378 9 6
F. J. Coxhead*	1363 13 6

LONDON.—For the erection of a block of offices to be called Parliament-chambers, Great Smith-street, Westminster. Messrs. Palgrave & Co., architects, 28, Victoria-street, S.W. Quantities by Mr. James Farrell:—

J. F. Holliday	£26,500
Kirk & Kirk	24,756
Martin, Wells, & Co., Ltd.	24,419
C. Gray	24,119
Frank Bush	22,789
J. Ferguson & Co.‡	22,500
J. Mowlem & Co., Ltd.	21,898
W. Pattinson & Sons	21,875
Perry & Co.	21,688
G. E. Wallis & Sons	21,444
Patman & Fotheringham	21,160
W. H. Lorden & Son	20,969
L. Whitehead & Co., Ltd.	20,875
F. G. Minter	20,790
Wm. Smith & Sons	19,894

‡ Too late for consideration.

LONDON.—For 7,000 yards of tar-paving works, Penge, for the Penge Urban District Council:—

Constable, Hart, & Co., Kentish Town ..... Tar-paving 1s. 9d. per yd. sup. Wood-edging 2½d. per ft. lin.

LUSTLEIGH (Devonshire). — For water supply works, Lustleigh, for Newton Abbot Rural District Council. Mr. Samuel Segar, engineer, Union-street, Newton Abbot. Quantities by engineer:—

W. C. Shaddock	£3,400 0 0	J. W. Deane, Ltd.	£2,480 15 0
Pethick Bros.	3,330 0 0	E. Pike	2,415 0 0
S. Roberts	3,095 0 0	Dart & Pollard	2,385 0 0
J. Shaddock	2,802 2 4	P. Wilson & Co.	2,263 0 0
Jenkins & Son	2,800 0 0	W. E. Bennett	2,153 2 6
Yeo & Son	2,719 0 0	Haskings & Best, Teignmouth*	2,005 0 0
C. Lang	2,686 0 0		
J. F. Price	2,515 0 0		

LOWER HAGLEY (Worcestershire).—For the construction of about 7,600 yards of pipe sewer, etc., and of bacterial sewage disposal works, for the Bromsgrove Rural District Council. Mr. H. W. Taylor, A.M.Inst.C.E., St. Nicholas-chambers, Newcastle-on-Tyne:—

H. Roberts	£5,420 0 0
Kellett & Co.	5,410 0 0
Waring & Sons	5,247 0 0
Barker Bros.	4,939 0 0
Johnson & Langley	4,897 0 0
Willetts & Sons	4,858 0 0
J. A. Meredith	4,702 0 0
Johnson Bros.	4,691 0 0
Currall, Lewis, & Martin	4,684 0 0
Vale & Sons	4,679 0 0
Byard & Sons	4,609 0 0
Morley & Sons	4,405 0 0
Jameson & Son	4,303 0 0
George Law	4,247 0 0
George Holloway	4,218 0 0
A. B. & W. J. Tilt, Birmingham-road, Bromsgrove*	4,107 0 0

MAESTEG (Wales).—For the erection of a Calvinistic Methodist Chapel, Nantyfyllen, for the Calvinistic Methodist Denomination. Architect: The Rev. W. Jones, Ton Pentre, Glamorganshire:—

William John Jackson	£2,839 0 0
Thomas James	2,200 0 0
Stephen Lewis	2,100 0 0
John Nicholas, Aberavon*	1,987 0 0

MAIDENHEAD.—For the erection of a free library. Messrs. Arthur McKewan and G. H. V. Cale, joint architects, Birmingham. Quantities by Mr. Geo. Hackford, Queen Anne's-gate, Westminster:—

Grubb & Vidler	£5,515 0 0	Silver & Sons	£5,094 0 0
Bissley	5,359 10 0	Edwards	5,057 0 0
J. K. Cooper & Sons	5,292 0 0	Creed	4,921 0 0
		Theaker	4,781 14 0
		Cox & Sons†	4,698 0 0

[All of Maidenhead.]

PETERBOROUGH.—For the supply of 15 in. and 6 in. glazed drain pipes, etc., for the City Council. Mr. J. W. Walshaw, City Surveyor, Guildhall, Peterborough:—

Whitaker & Co., Grimshaw Park, Blackburn:—

	s.	d.	
15 in. pipes	4	1	per yard.
15 in. by 6 in. junctions	6	1½	each.
6 in. pipes		10½	per yard.
6 in. bends		10½	each.
15 in. manhole blocks	13	6	each.
12 in. manhole blocks	7	0	each.
6 in. stoppers	3	6	per dozen.

PURLEY.—For the erection of residence, Central-road, Purley, Surrey, for Mr. J. W. Forrester. Mr. J. Halsted Waterworth, architect and surveyor, 281a, Queen's-road, New Cross Gate, S.E., and Welling, Kent:—

Hanscomb & Smith	£2,763 0 0
S. R. Best	2,175 0 0
David Waller	1,949 0 0
W. H. Baldwin	1,945 0 0
T. Vaughan & Sons, Caterham Valley*	1,718 0 0

RICKMANSWORTH.—For new offices at Rickmansworth, for the Rickmansworth and Uxbridge Valley Water Company. Mr. H. Knight, architect, 75, Aldermanbury, E.C.:—

Turtle & Appleton £2,820

SALISBURY.—For excavating site and building foundation walls for new class-rooms and cubicles, at Barnard's Cross, for the Salisbury Diocesan Training College. Messrs. J. Harding & Son, architects, 58, High-street, Salisbury:—

Harris Bros.	£240 0 0	Wort & Way*	£225 0 0
H. J. Kite	225 0 0	Tryhorn & Son	210 10 0

[All of Salisbury.]

SHEFFIELD.—Accepted for new stores, Northfield-road, Crookes, for Ecclesall Industrial and Provident Society, Ltd. Mr. H. L. Paterson, architect, 119, St. James's-street, Sheffield:—

Mason and Bricklayer: E. Butcher, Wadsley, Sheffield	£943 18 3
Carpenter and Joiner: J. I. Robertson, Sheffield	350 0 0
Slater: Pickles Bros., Leeds	40 10 0
Plasterer: C. R. Chadwick, Sheffield	76 0 0
Plumber and Glazier: Snowden & Son, Sheffield	179 0 0
Painter: G. Cross, Derby	42 1 4

[Total, £1,631 9s. 7d.]

SOUTHAMPTON.—For iron fire escape, staircase, and bridge from tramps' ward and fire escape from boys' dormitory at the workhouse, for the Guardians. Messrs. Mitchell, Son, & Gutteridge, architects, 9, ortland-street, Southampton:—

Stevens & Co.	£700	Hayward Bros.	£568
H. Stiles	691	Jenkins & Sons	567
Williams & Son	647	Shalders	566
Doggrell & Sons	631	E. Wood & Co.	562
Hall & Sons	606	Norton	549
General Iron Foundry Co.	604	Cawte	537
		Grace	480
Herring & Sons	582	Nichol, Southampton*	471
Udall & Co.	582		

SOUTHWICK (Sussex).—For street works (Green-road, South View-road, and Underdown-road), for the Urban District Council. Mr. G. W. Warr, Surveyor. Quantities by Surveyor:—

H. A. Chambers	£3,073 9 2	J. Parsons & Sons	£2,839 0 0
E. H. King	2,945 14 0	W. A. McKellar	2,829 0 0
J. Whittington	2,899 2 6	Peerless, Denis, & Co. E'bo'rne*	2,747 0 0
Woolgar Bros.	2,897 1 8		
D. & J. Hall	2,843 7 6		

(*Continued on page* 154).

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Applications to be in
*Designs for Branch Public Libraries	County Borough of St. Helens	20*l.* and 10*l.*	Mar. 31
Isolation Hospital	Perth Town Council	30, 20, and 10 guineas	April 6
*Proposed Free Library	Malvern U.D.C.	30*l.*, 20*l.*, and 10*l.*	April 8

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Reconstruction, Brougham Arms H., Kirkgate, Leeds.	.....	S. Jackson & Son, Architects, Tanfield-chambers, Bradford	Feb. 6
Shop Fixtures, etc., Ferry Hill Village Store	Coxhoe Co-operative Society	The Manager, Ferry Hill, Durham	do.
Three Hou. & Shop, Cresswell-st., Pagmoor, Barnsley	.....	G. Moxon, Architect, Barnsley	do.
Paving, etc., Works	Manchester Corporation	Paving Department (Surveyor's Office), Town Hall, Manchester	Feb. 8
2¼ miles of c.i. Pipes, Elgin	Gt. N. of Scotl'd & Hi'l'd Ry. Co.	Office of Engineer, Great North of Scotland Railway, Aberdeen	do.
Intake Tank, etc., for Water Supply	do.	do.	do.
Addition to Teacher's House, Archiestown	.....	J. Wittet, Architect, Elgin, N.B.	do.
Sewers and Sewage Purification Works, Menstrie	Clackmannanshire C. C.	W. R. Copland, C.E., 146, West Regent-street, Glasgow	do.
Fire Hose Fit'gs, Cott. Homes, Oliver Mt., Wavertree	Liverpool Parish Council	Parish Offices, Brownlow Hill, Liverpool	do.
Shop Premises, New Albion-place, Leeds	.....	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Alteration, etc., Men's Day Room at Workhouse	East Stonehouse Guardians	F. A. Wiblin, Architect, Town Hall, Stonehouse	do.
Repair of Houses in Victoria-crescent, Elgin	.....	J. Wittet, Architect, Elgin	do.
2,000 Tons Welsh Granite Setts	Manchester Corporation	Chief Clerk, Highways Department, Town Hall, Manchester	do.
Shop Fronts, Market-street, Bury, Lanc.	District Co-op. Provision Society	D. Hardman, Architect, Agur-street, Bury	do.
Roof Work, Queen-st. Scot's Ch. National Schl, Cork	.....	R. Walker & Son, Architects, 17, South-mall, Cork	do.
Small Addition to Isolation Hospital, Tewkesbury	.....	Borough Surveyor's Office, Station-street, Tewkesbury	do.
Water Mains, North Benfleet and Bowers Gifford	Billericay R.D.C.	R. J. W. Layland, Billericay, Essex	do.
Pipe Sewer, Morriston, Swansea	Corporation	R. H. Wyrill, Borough Engineer, Swansea	do.
Paving Streets	Musselburgh Town Council	G. Landale, Burgh Surveyor, Musselburgh, Edinburgh	do.
Carting Road Material	Branston R.D.C.	J. W. Watson, Surveyor, Potterhanworth, Lincolnshire	Feb. 9
Street Works	Cardiff Corporation	Borough Engineer (W. Harpur, M.I.C.E.), Town Hall, Cardiff	do.
Stone Supply	do.	do.	do.
Stores	do.	do.	do.
Portland Cement	do.	do.	do.
Asphalting, Sick Asylum, Devon's-road, Bromley, E.	Man'gers, Poplar & Stepney S. A. D.	Engineer at the Asylum	do.
Repairs to Schools	Leeds Education Committee	Architect's Department, Education Offices, Leeds	do.
Street Works, Brickfield-road, etc.	Southampton Corporation	Borough Engineer's Office, Market Chambers, Southampton	do.
House & Shop, S'th-side, Clough Bde.-rd., Bridlington	C. Cast	J. Earnshaw, Architect, Carlton House, Bridlington	do.
Alteration, etc., of Properties in Clare st., Bridgwater	Town Council	Municipal Offices, High street, Bridgwater, Somerset	do.
Painting Mascotte House, 48, Promenade, Bridlington	Property Committee	Borough Surveyor, Town Hall, Bridlington	do.
Painting Shelter & Bandstand, Prince's-pde. ,,	do.	do.	do.
Railway Weighbridge	Elec. Committ., S'thampton Corp.	Borough Electrical Engineer, Electricity Works, Southampton	Feb. 10
Roadway, Llathygae, near Pumpsaint, Llanwrda	H. M. Lloyd	D. Jenkins, F.R.I.B.A., Llandilo	do.
Water Supply	do.	do.	do.
Stores	Glasgow & S.W. Ry.	Stores, Superintendent's Office, Kilmarnock	do.
Wire Fencing	do.	Engineer, St. Enoch Station, Glasgow	do.
Street Works, Cathays	Cardiff Corporation	W. Harpur, M.Inst.C.E., Borough Engineer, Cardiff	do.
Cartage of Road Materials	Warwickshire County Council	County Surveyor (J. Wilmot), 6, Waterloo-street, Birmingham	do.
New Wing and Kitchen, St. Jariath's Coll., Tuam	Rev. Dr. Healey	D. Morris, Building Surveyor, 68, Harcourt-street, Dublin	do.
Stores	Mid. R. Co.; N. Co. Com't., Ireland	Mr. Ellis, Stores Superintendent, York-road Station, Belfast	do.
Making School Doors Open Outwards	East Ham Education Committee	Education Office, Wakefield-street, East Ham	do.
Materials, Highways and Sewers Committees	Stockport Corporation	J. Atkinson, A.M.Inst.C.E., Borough Surveyor, Stockport	do.
Works on Highways	do.	do.	do.
Annual Contracts	Hammersmith Borough Council	H. Mair, Borough Surveyor, Town Hall, Hammersmith	do.
Hot Water Heating Apparatus, County Council Offices	Londonderry County Council	T. B. Adams, Secretary, County Court House, Londonderry	do.
Electric Lighting, Armley Branch Library	Leeds Corporation	Town Clerk, Town Hall, Leeds	do.
Two Filters, etc., Balamenach, West Loch, Tarbert	Tarbert Water Committee	Warren & Stuart, Engineers, 94, Hope-street, Glasgow	do.
C.i. Pipes and Castings	do.	do.	do.
3,830 Yards of 6 in. Pipes, etc.	Glyncorrwg U.D.C.	W. P. Jones, Council Offices, Cymmer, Port Talbot	do.
3,830 Yds. of 6 in. Mains (Lloyd's-ter., Cymmer, etc.)	do.	do.	do.
100 Lineal Yards Water Main at Gilfach Goch	Llantrisant, etc., R.D.C.	G. S. Morgan, Surveyor, School-street, Pontyclun	do.
150 Yards Water Drains, Mill-street, Tonyrefail	do.	do.	do.
Retaining Walls	do.	do.	do.
Sewers and Water Mains, Llantrisant	do.	do.	do.
Additions to Farm Steading, Kingask, nr. Cupar, Fife	.....	D. Storrar, Architect, Cupar, Fife	do.
70,000 Best Stock Bricks	Gillingham Corporation	Borough Surveyor's Office, Gardiner-street, Gillingham, Kent	do.
930 Yards Wrot-Iron Fence, etc.	do.	do.	do.
Ornamental Gates, etc.	do.	do.	do.
Road Works, etc. (King-street, etc.), Hurst	Hurst U.D.C	S. Shirt, Surv., Council Offices, King-st. Hurst., nr. Ashton-u.-Lyne	do.
Hauling Materials for Roads	Weobley R.D.C.	T. Gwillim, Weobley, R.S.O.	Feb. 1
Annual Contracts	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford	do.
Stores, Waterworks Department	Southampton Corporation	W. Matthews, Waterworks Engineer, 18, French-st., Southampton	do.
Eleven Houses, Arncliffe-terrace, Horton	.....	W. Ryecroft, Architect, Bank-buildings, Manchester-road, Bedford	do.
Wat. Sup. W'ks, Knockando-Glenlivet Dis., Dalbeattie	.....	C. C. Doig, C.E., Elgin	do.
Branch Store, Drighlington	Co-operative Society, Limited	Society's Offices, Drighlington	do.
Cartage Work	Hackney Borough Council	Norman Scorgie, Borough Engineer, Town Hall, Hackney, N.E.	do.
Alterations etc., to 10, Walmer-villas, Bradford	.....	C. H. Hargreaves, Architect, Exchange, Bradford	do.
Four Ornamental Kiosks	Property Committee, Bridlington	E. R. Matthews, C.E., Borough Surveyor, Town Hall, Bridlington	do.
Dwarf Wall	do.	do.	do.
Iron Palisading	do.	do.	do.
Colonnade	do.	do.	do.
House and Shop, Clough Bridge, Bridlington	Spencer & Son	A. T. Martindale, Architect, 66, Wellington-road, Bridlington	do.
Restoration Work, Ch. of St. Lucius, Farnley Tyas	.....	J. Kirk & Sons, Architects, Huddersfield	do.
Store, Chatsworth-road, Worthing	.....	Borough Surveyor, Municipal Offices, Worthing	do.
*Road-making, Paving, and Lighting Works	Kingston-on-Thames Corp.	Borough Surveyor Clattern House, Kingston-on-Thames	do.
Thirty-three Houses at Tirphil	Graig-Rhymney Building Club	T. Roderick, Architect, Glebeland, Merthyr Tydfil	Feb. 12
Alterations, etc., Chopwell Hotel	Consett Iron Co., Ltd.	C. F. Oliver, Architect, General Offices, Consett	do.
Gates & Railings, Buslingthorpe Grd., Chapelt'wn-rd.	Leeds Corporation	City Surveyor's Office, Leeds	do.
Two Museum Cases and Five Cupboards	Education Committee, Bootle	Elementary Education Offices, Balliol-road, Bootle	do.
Two Shops, High-street, Merthyr	.....	C. M. Davies, Architect, Merthyr, Wales	do.
Altera., Old Bridewell-bdgs., Tipperary (Tech. Sch.)	H. B. & J. E. Banks	W. H. Hill & Son, Architects, 28, South-mall, Cork	do.
Rag Warehouse and Stables, Townend, Morley	Admiralty	T. A. Buttery & S. B. Birds, Architects, 1, Basinghall-sq., Leeds	do.
*Additional Houses, etc., at Netley Coastguard Station	do.	Superintending Engineer, H.M. Dockyard, Portsmouth	do.
*New Coastguard Station, etc., St. Leonards	London County Council	Director of Works Dept., 21, Northumberland-avenue, W.C.	do.
*Supply of Chairs		Parks Department, 11, Regent-street, S.W.	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Designs to be delivered
2,800 Tons c.i. Pipes, etc., Masham	Harrogate Corporation	E. W. Dixon, M.Inst.C.E., 14, Albert-street, Harrogate	Feb. 13
Street Works, Mediock-street, etc.	Droylsden U.D.C.	C. Hall, Surveyor to Council, 10, Ashton-road, Droylsden	do.
Road Material and Cartage	Bedfordshire County Council	County Surveyor, Shire Hall, Bedford	do.
Materials, etc.	Richmond (Surrey) Town Council	J. H. Brierley, Borough Surveyor, Richmond, Surrey	do.
Materials (Four Divisions)	Glamorgan County Council	T. Lloyd Edwards, County Surveyor, Town Hall, Bridgend	do.
Haulage	do.	do.	do.
Tools and Ironmongers' Goods	do.	do.	do.
275 ft. Stoneware Pipe Sewer	Berkhamsted R.D.C.	W. H. Thomas, Surveyor, Tring	do.
Materials, Blackburn	The Corporation	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn	do.
*Concrete and Brick Foundations for Acid Works	Coventry Corporation	F. W. Stevenson, Gas Works, Coventry	do.
Steel Roof, Malahide Station	Great Northern Ry. Co. (Ireland)	W. H. Mills, Engineer, Amiens-street Terminus, Dublin	Feb. 15
Steel Footbridges, Malahide and Tanderagee	do.	do.	do.
Syphon Pipe, 70 ft. long, Dublin	do.	do.	do.
Furniture, etc.	Colne & Holme J'nt. H'sp't'l Com	J. Berry, Architect, 3, Market-place, Huddersfield	do.
*Double Tenement Dwellings, Houses, Shops, etc.	Brighton Borough Council	Town Clerk. Town Hall, Brighton	do.
Eight Shops and Houses	do.	do.	do.
Filling-in Front of Hamilton Terrace Cliffs	Felixstowe and Walton U.D.C.	S. E. Fisher, Surveyor to Council, Town Hall, Felixstowe	do.
Electric Wiring, Pathhead Hall	Kirkcaldy Corporation	O. F. Francis, Burgh Electrical Engineer, Victoria-rd., Kirkcaldy	do.
Furniture, Tooting Bec Receiving Home, S.W.	Metropolitan Asylums Board	Office of the Board, Embankment, London, E.C.	do.
Drainage Work, Wester Gauldwell Farm	.....	R. Hendry, Forester, Arndilly, N.B.	do.
Extension of Free Library, Great Yarmouth	Free Library Committee	J. W. Cockrill, Borough Surveyor, Town Hall, Great Yarmouth	do.
Electric Wiring, Euclid-street School	Swindon Corporation	J. G. Griffin, Electrical Engineer, Electricity Works, Swindon	do.
Making up Burlington-road, Swanage	U.D.C.	T. Randell, Clerk, Town Hall, Swanage	do.
Wood Paving, Norton Folgate, etc.	Shoreditch Borough Council	J. Rush Dixon, Borough Engineer, Town Hall, Old-street, E.C.	Feb. 16
Thirty-eight Labourers' Cottages	Rathdown No. 1 R.D.C.	R. M. Butler, Architect, Dawson-chambers, Dawson-st., Dublin	do.
Repair of Five Cottages	do.	do.	do.
Fuel Economisers, etc., Tramway Works	L.C.C.	County Hall, Spring-gardens, London	do.
Timber Retainer, etc., at The Howl-Ings	Tynemouth Corporation	Borough Surveyor's Office, North Shields	do.
Supply of Whinstone and Limestone	Middlesbrough R.D.C.	W. H. Dixon, Dis. Surv., Kirkby-in-Cleveland, nr. Stokesley, R.S.O.	do.
*Removal of Clinker for One Year	Bermondsey Borough Council	Borough Surveyor, Town Hall, Spa-road, S.E.	do.
Road Materials	Potterspury R.D.C	J. B. Fairchild, Surveyor, Potterspury, Stony Stratford	Feb. 17
Carting Materials	do.	do.	do.
Urinal Stalls, Underground Lavatory, Albert-square	Manchester Corporation	City Surveyor's Office, Town Hall, Manchester	do.
Retorts	Millom U.D.C.	W. T. Lawrence, Clerk, Dist. Council Offices, Millom Cumberland	do.
Twelve Houses, Haverton-hill, Middlesbrough	D. & F. Munro	Moore & Archibald, Architects, 27, Albert-road, Middlesbrough	do.
*Erection of Shelters, South Park, Fulham	Fulham Borough Council	Boro igh Engineer, Town Hall, Fulham, S.W.	do.
*Excavating Trenches, Laying Pipes, etc.	U.D.C. of Chiswick	Council's Surveyor, Town Hall, Chiswick	do.
*Ventilating Shafts	do.	do.	do.
Sewerage Works, South Elmsall	Hemsworth R.D.C.	T. H. Richardson, Engineer, Hemsworth, near Wakefield	Feb. 18
Granite at Stations	East Retford Corporation	J. D. Kennedy, Borough Surveyor, East Retford	do.
Boiler House, District Lunatic Asylum, Killarney	.....	J. F. Fuller, Architect, 179, Great Brunswick-street, Dublin	do.
Extensions at Sanatorium, Lancaster	Sanitary Committee	Borough Surveyor, Market-square, Lancaster	do.
*Fire Mains at Tanner-street Workhouse	St. Olaves' Union	Newman & Newman, 31, Tooley-street, S.E.	do.
Annual Contracts, Sheffield	Highway and Sewerage Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield	Feb. 19
Board School, Long Lee, Keighley	Keighley School Board	A. P. Harrison, Architect, 18, Cooke-lane, Keighley	Feb. 20
Road Materials, etc.	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes	do.
Steel Rails, Masham Scheme Quarry Railway	Harrogate Corporation	E. W. Dixon, M.Inst.C.E., 14, Albert-street, Harrogate	do.
2,000 Wooden Sleepers for Light Railway, Masham	do.	do.	do.
Workmen's Houses, Bangor, Wales	City Council	J. Gill, City Surveyor, Town Hall, Bangor	do.
*Infectious Diseases Hospital	Reading Borough Council	C. Smith & Son, Architects, 164, Friar-street, Reading	do.
Works in 10 Streets and 18 Passages, Simms Cross	Widnes Corporation	J. S. Sinclair, Borough Surveyor, Town Hall, Widnes	Feb. 22
Waterworks, Dutton and Preston-o'-th'-Hill	Runcorn R.D.C.	G. F. Ashton, Clerk, 71, High-street, Runcorn	do.
Ry. Sta.-bdgs., Blackw'd to Darvel & Muir Kirk Rys.	Caledonian Ry. Co.	Engineer's Office, Buchanan-street Station, Glasgow	do.
*Wood Paving Works	Hornsey Town Council	Borough Engineer, Southwood-lane, Highgate, N.	do.
*Annual Contracts	St. Pancras Borough Council	Boroug h Engineer, Town Hall, Pancras-road, N.W.	do.
Five Cottage Homes, Bedwellty Park, Tredegar	Bedwellty Guardians	W. Beddoes Rees, A.R.I.B.A., 37, St. Mary-street, Cardiff	Feb. 23
Drainage of Village of Delgany, etc.	Rathdown No. 2 R.D.C.	Ryan & Butler, Engineers, 12, Dawson-street, Dublin	do.
Robins-lane Intercepting Sewer, St. Helens, Lancs.	St. Helens Health Committee	G. J. C. Broom, Borough Engineer, St. Helens	do.
*Additions and Alterations to Epsom Workhouse	Epsom Union	H. D. Searles Wood, Architect, 157, Wool Exchange, E.C.	do.
Free Library, Knutsford	Knutsford U.D.C.	Darbyshire & Smith, Architects, 17, Brazennose-st., Manchester	Feb. 24
*Hiring of Lindsey Jetty, Cheyne Walk	Chelsea Borough Council	Borough Surveyor, Town Hall, Chelsea, S.W.	do.
Burr Groin, Sea Defence Works, The Parade	Walton-on-Naze U.D.C.	H. W. Gladwell, Surveyor's Office, High-street, Walton-on-Naze	Feb. 25
Street Works (Green-lanes, West-street, etc.)	do.	do.	do.
Making-up Ayton-road, etc.	Ramsgate Corporation	T. G. Taylor, Borough Surveyor, Albion House, Ramsgate	do.
*Annual Contracts	Islington Borough Council	Town Hall, Upper-street, N.	do.
*Road Material, Stores, Forage, Horse Hire, &c.	Woolwich Borough Council	Borough Engineer, Murey-road, Plumstead	do.
*Farm Buildings, Talgarth	Brecon and Radnor Asylum	Giles, Gough & Trollope, 28, Craven-street, Charing Cross	Feb. 26
*Pair of Semi-Detached Cottages, Talgarth	do.	The Clerk, at Asylum, Talgarth, R.S.O.	do.
Curved Girder Roof, Granton	Gas Coms., Edin. & Leith Corps.	W. R. Herring, M.Inst.C.E., Chief Engineer and Manager	Feb. 29
Ordinary Roofs, etc., Granton	do.	do.	do.
Thorner Sewerage and Sewage Disposal	Wetherby R.D.C.	Richardson & Hartley, Engineers, East Parade-chambers, Leeds	do.
*12,000 Tons 2 in. Blue Guernsey Granite, etc.	Middlesex County Council	County Engineer and Surveyor, Middlesex Guildhall	Mar. 1
*Cartage of Materials	do.	do.	do.
*Municipal Offices and other Buildings	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	do.
*Light Railways	Middlesex County Council	County Engineer, Middlesex Guildhall, Westminster	do.
3,400 Lineal Yards of Sewers, Headcorn, Kent	Hollinbourn R.D.C.	Fairbank & Son, C.E., Lendal-chambers, York	Mar. 2
*Children's Homes, Schools, etc., Hutton, Essex	Poplar Union	J. R. Hunt & Co., 181, Queen Victoria-street, E.C.	Mar. 4
*Electric Power Transmission Scheme Buildings	Birmingham Dis. Board and Corp.	J. D. Watson, Engineer, Tyburn, near Birmingham	Mar. 7
Conveyance of Ammoniacal Liquor	Manchester Corp. Gas Com.	C. Vickson, Gas Department, Town Hall, Manchester	Mar. 24
Coaling Plant for Port Natal	Government of Natal	Agent-General, 26, Victoria-street, Westminster, S.W.	Mar. 25
*Fitting-up Kitchens, New W'kh'se, Wormw'd Scrubbs	Hammersmith Guardians	Giles, Gough, & Trollope, Archs., 28, Craven-st., Charing Cross, W.C.	No date
*Fitting-up Laundry, New W'khse, Wormwood Scrubbs	do.	do.	do.
Seating of Battery of Water Tube Boilers	.....	Manager, Bettisfield Colliery Company, Ltd., Bagillt, Flintshire	do.
Excavating, etc., Two Boiler Feed Ponds	.....	do.	do.
Alterations to Seawfell Hotel, Seascale	Executors of J. Tyson	Oliver & Dodgshun, Architects, Carlisle	do.
Dining-room, etc., at Hostel, Barnard's Cross	Salisbury Diocesan Training Coll.	J. Harding & Son, Architects, 58, High-street, Salisbury	do.
Road, 700 Yards Long, Silkestone	.....	Estate Office, Silkstone	do.
Thirteen Dwelling Houses, Stranmillis	.....	R. A. Boyd, Architect, 22, Lombard-street, Belfast	do.
Schools, Springwell, near Gateshead	Usworth School Board	S. Wilkinson, Architect, 30, Mosley-street, Newcastle-on-Tyne	do.
Pitch and Creosote Oil for Paving Committee	Manchester Corporation	Chief Clerk, Highways Department, Town Hall, Manchester	do.
Stores	Directors, Mersey Railway Co.	G. H. Langham, Secretary, Worcester House, Walbrook, E.C.	do.
Electric Light, W'km'n's Club & Inst., Ushaw Moor.	The Workmen's Club, Ltd.	J. Gates, Whitworth House, Station-road, Ushaw Moor, Durham.	do.
One Shop & Two Houses, Church-st., Llantwit Major	.....	Old White Hart, Llantwit Major	do.
*Two Locomotives, Waterside Station, Londonderry	Donegal Ry. Co.	Loco. Superintendent, Stranorlar Station, co. Donegal	do.
*New Schools, Stockingford, Nuneaton	Nuneaton, etc., U.D.C.	H. Quick, Architect, 64, Hertford-street, Coventry	do.
*Sundry Works to Complete Six Houses, Finchley	.....	R. J. Tasker, 28, John-street, Bedford-row, W.C.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Tenders to be delivered
*Engineering Assistant	Burnley Corporation	117*l.*	Feb. 10
*Quantity Surveyor	do.	2*l.* 2s. per week	do.
Sewerage Assistant	Leicester Coporation	120*l.*	do.
*Clerk of Works	Harrogate Corporation	3*l.* per week	Feb. 13
Surveyor	Sutton-in-Ashfield U.D.C.	150*l.*	Feb. 29
*Architectural Draughtsman, Portland	Works Dept., Admiralty	Not stated	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xviii.

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TENDERS—*Continued from page* 151.

SOUTH SHIELDS.—For new biscuit factory and warehouse, caretaker's house, cooperage, washing-sheds, etc., at Tyne Dock, for Mr. H. Wright. Mr. F. Rennoldson, architect, 37, King-street, South Shields. Quantities by the architect:—

R. M. Storey	£17,232 9 11
G. O. Gillespby	16,978 10 9
T. Lumsden	16,920 0 0
W. J. Robertson & Sons	16,120 0 0
G. Thornton & Co.	16,042 13 4
Glen & Moffett	15,968 19 0
W. D. Allison	15,694 5 1
James Young	15,652 14 5
Alexander Ross	15,491 14 3
R. Summerbell & Sons	15,322 0 0
J. Moore	15,219 13 6
W. T. Weir	15,159 0 0
Wm. Kennedy	14,975 0 0
J. C. Nichol	14,706 10 7
S. F. Davidson	14,584 0 0
Wm. Forster	14,320 0 0
S. Sheriff & Sons*	14,276 8 4

WALSALL.—For paving works in Queen-street, Palfrey, for the Corporation. Mr. R. H. Middleton, Borough Surveyor, Walsall:—

James Owens, Wolverhampton* .. £639 2 0

WALTHAMSTOW.—For corrugated iron shed and inclined roadway, for the Walthamstow Urban District Council. Mr. G. W. Holmes, Engineer, Town Hall, Walthamstow:—

Baker & Co.	£2,200	Rowlingson	£1,640
W. E. Wood	1,901	Braby & Co.	1,571
Dierson & Co.	1,805	Cross & Cross	1,495
Westwood & Co.	1,770	Norton Bros.	1,410
Brownlie, Murray, & Co.	1,689	Wood & Co.	1,389
		Smith & Co.*	1,354

Inclined Roadway (Builder's Work):

A. T. Catley	450	W. Manders*	420

WALTHAMSTOW.—For the erection of bridges, for the Walthamstow Urban District Council. Mr. G. W. Holmes, Engineer, Town Hall, Walthamstow:—

	Dagenham Brook Bridge Widening.	Water Works River Bridge.	Blackhorse Lane Bridge Widening.	Ching Bridge.
A. T. Catley	£250*	£800*	£870*	£650*
A. Fasey	258	1,169	920	745
Wilkinson Bros.	296	904	1,071	714
D. R. Paterson	350	2,200	1,230	900
G. Bell	397	1,119	1,169	897
M. Dinnie	433	1,097	1,058	—
W. Manders	440	1,550	1,480	1,003
J. A. Reed	—	—	938	704
A. Dixon & Co.	—	—	—	800

WALTHAMSTOW.—For the erection of a new shop in Higham Hill-road, for Mr. C. J. Geary. Messrs. Selby & Kislingbury, architects, 44, Chancery-lane:—

J. V. Riddle & Son	£797 0 0
Stewart & Co.	453 0 0
J. Abbott (amended)*	380 0 0

WARRINGTON.—For one year's supply of earthenware ducts for drawing-in of mains, for Electricity and Tramways Committee of Corporation. Mr. W. H. Grimsdale, Borough Electrical Engineer, Howley, Warrington:—

Albion Clay Co. Ltd.* (schedule of prices).

WILLENHALL (Staffs.).—For road works, Back-lane, for the Urban District Council. Mr. T. E. Fellows, C.E., Engineer, Town Hall, Willenhall. Quantities by Engineer:—

R. W. Fitzmaurice & Co.	£467 14 10
Herbert Holloway	443 16 0
Currall, Lewis, & Martin	435 6 0
W. H. Reading	424 0 0
James Owens	389 9 6
George Holloway, Wolverhampton*	375 0 0

WILLENHALL (Staffs).—For 1,750 yards of stone kerbing and sett channelling, Bilston main road, for the Urban District Council. Mr. T. E. Fellows, C.E., Engineer and Surveyor, Town Hall, Willenhall. Quantities by Engineer:—

Herbert Holloway	£682 7 0
John Gott	666 17 [illegible]
George Holloway	623 9 0
R. W. Fitzmaurice & Co.	616 1 9
Currall, Lewis, & Martin	601 7 3
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The Builder.

VOL. LXXXVI.—No. 3184. FEBRUARY 13, 1904.

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Competition Design for Cockington Church ..... By Mr. A. H. Skipworth.
A Dining Hall ..... Mr. A. D. Clark, Architect.
Decorative Treatment for a Billiard Room ..... Messrs. Waring and Gillow.
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Egyptian Antiquities.

HAPPILY, the time has gone for ever when the rulers of Egypt looked upon temples and pyramids merely as crumbling masses of stone or as convenient stores of material for building purposes. In the present era of enlightenment the people of Egypt and the world at large have reason to be grateful for the care taken by the Government to preserve the remains that serve in a measure to link the XXth century with remote antiquity. It is to be regretted, however, that those who are responsible for the control of Egyptian finances have hitherto failed to give adequate support to the work, and it is to be hoped that no false notion of economy or international jealousy may be allowed in future to cramp the efforts which are being made to preserve the ancient monuments to the last fragment. In the last Report of M. Maspero—Director-General of the Antiquities Service—we notice again and again the complaint that, owing to the lack of sufficient funds, it is impossible to exercise the complete supervision that is desirable for the protection of excavated ruins, and the prompt detection of faults, and, when faults are detected, to undertake or to finish the necessary repairs in time to prevent disaster. In connexion with protective work, it must be remembered that immediate attention is always essential, otherwise the ceaseless action of the atmosphere and the sand, the continual depredations of unscrupulous and greedy natives, and, we are sorry to say, of equally unscrupulous tourists, must inevitably result in serious injury to monuments that can never be replaced.

The tour of the Director-General in the winter of 1901-1902 showed that damage still continued at many of the sites. In some cases this was due to natural decay, and, in the case of Beni-Hassan, to a violent gale, which flooded the tombs and caused injury to several pictures. At El-Amarna, however, a portion of the painted pavement discovered by Professor Flinders Petrie was wantonly destroyed by repeated blows from the umbrella of an American lady visitor, "before either the ghafir or the two European travellers who reported the deed could intervene." It also became evident to M. Maspero that in several tombs of the Theban Kings, and especially in that of Seti I., the vibrations caused by the steps of the parties of tourists who visit the buildings were slowly but surely damaging these monuments, by causing portions of the frescoes on the walls and roofs to fall down. During the winter of 1902 several fragments of roof masonry and a column were displaced in this way. In other cases it appears that damage might have been avoided if adequate measures could have been taken to guard against impending danger at the proper time.

After his inspection M. Maspero carefully noted the points in each locality where danger was most imminent, and carried out the most pressing works of protection so far as permitted by the funds at his disposal. At the Temple of Seti I. at Abydos and at that of Rameses III. at Karnak it was found possible to strengthen some of the architraves and roof slabs by iron girders, in accordance with arrangements made after the inspection of 1901; but unfortunately it happened that at several other places the material and workmen arrived too late for the repairs to be executed. In the small Temple of Thoutmosis III. at Medinet-Habu two of the slabs in the steps of the sanctuary fell in December, 1902; but the worst damage occurred at Kom Ombo. A huge mass of sand and *débris* taken from the area, or floor, of the temple was piled up in the court-yard, and the attempt was foolishly made to retain it by a wall of dry bricks built on the remains of the ancient girdle wall. It would have been far more easy, as well as far less troublesome, if the foreman in charge had kept down the height of this mound by spreading the material over a large area; then it would have been perfectly safe, and the labour of building a brick wall could have been avoided. When the condition of things came to the knowledge of a responsible official instructions were immediately given to remove the mass of sand pressing against the eastern wall of the court-yard, but, owing to want of money, the work was carried on so slowly that four months later the brick wall broke down suddenly, near the place where the figures of the Emperor Macrin and his son Diaduménian are carved. A stream of sand poured through the breach and displaced some twenty of the blocks of the ancient wall. The sand was cleared out as soon as possible and the stone wall was shored up with beams, the rubbish being thrown into the Nile so far as the available resources permitted. But the danger was not yet over, and it was

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proposed to recommence the clearing process in 1903, and, if necessary, to level the entire mound right down, or, at least, those parts of it which pressed against the ruins of the temple on the east and south sides.

At Edfu a still greater danger threatened the magnificent Temple of Horus, which, in spite of the 2.000 years that have passed over it, is still in a state of almost perfect preservation. This peril was detected by the Director-General, who noticed that the foundations of the western wall were perceptibly sinking. He ordered the threatened portion to be kept under daily observation, with the result that on returning at the expiration of six months he was convinced that the damage had made perceptible increase and required immediate attention. In December, 1902, the top of the wall was overhanging at the worst place by no less than 0.59 mètres, so that it was deemed necessary to demolish entirely a length of as much as 70 mètres, from the north-west angle to the gateway leading to the western Colonnade of the court. The five most northerly columns of the Colonnade were also much damaged, together with the corresponding part of the wall, and required immediate repair. It was estimated that the cost of the necessary works would be 1,200E*l*. for restoration of the wall and 400E*l*. for reinstating the columns. Fortunately, owing to the saving effected in the estimated cost of the works at Philæ, it was not necessary for M. Maspero to ask for an additional credit, and the Ministry of Public Works immediately authorised him to apply the sum of 1,000E*l*. to the works required at Edfu. The necessary material and tackle having been collected, the work was commenced in March, 1903, and the damaged wall has now been rebuilt, but it is probable that the restoration of the columns will not be completed until the year 1905.

For the purposes of the Antiquities Service, Egypt is divided into two districts:—(1) The North Inspection and (2) the South Inspection, each of which is under the supervision of a Chief Inspector. There is so marked a difference in the character of these inspectorates that each presents special difficulties and demands special treatment. In the South Inspectorate, from Nag-Hammadi to the Second Cataract, the cultivated lands are restricted in area and the population is extremely sparse. Consequently, the ancient sites have suffered comparatively little; complete or only partially ruined temples and cities abound on both banks of the Nile; and the Chief Inspector is able to devote nearly the whole of his energy to the preservation and protection of the monuments. Hence he has been able, at Edfu, to superintend the erection of girders for the purpose of strengthening the roofing of the Vestibule and of the Hypostyle Hall in the Temple of Horus; at Kom Ombo, to undertake the repairs already mentioned; and at Thebes, to see to the erection of wooden doors in several tombs of the Sheikh Abdel Gournah, and to the installation of electric light in six of the Royal tombs.

Those who have visited these tombs must have been struck with the marked dilapidation caused by the torches and candles formerly used by tourists, and the same effect attracted the notice of M. Maspero on his return to Egypt two or three years ago. After careful consideration he came to the conclusion that the best way of preventing further injury would be to illuminate the tombs by electric light. The chief difficulty in the way of this proposal was, as usual, the lack of funds. This obstacle being overcome, a contract was given to an electrical engineer at Luxor, who undertook, for the sum of 560E*l*., to provide and instal the necessary plant for lighting the six tombs selected for an experimental installation.

After full consideration it was decided that the generating machinery should be erected in the tomb of Rameses XI., of which the sculptures had already almost entirely disappeared. The entrance and the vestibule were thoroughly cleared and the walls were properly repaired for the installation of the plant, which was completed in March, 1902, and taken over a few days afterwards by the chief electrical engineer of the Public Works Department. Everybody who has visited the Royal Tombs since the new system of lighting was installed agrees that it has effected a great improvement, not merely in the lighting of the paintings and sculptures, but also in the condition of the atmosphere, which in former times was almost unbreathable for an hour or two after the visit of every party of tourists, armed with torches, candles, and magnesium lamps. Further, to complete the organisation of the Valley of the Kings, barriers have been put up to facilitate the inspection of tourists' tickets; the paths have been cleared of rubbish and clearly marked out by large stones, and a covered shed has been erected, where about a hundred donkeys can be sheltered while their riders are going the round of the tombs.

In the Northern Inspectorate, from Nag-Hammadi to the sea, the conditions are totally different from those prevailing in the district to which the foregoing remarks apply. There are but few temples, those of Abydos being the best preserved. Nearly all the sites of ancient cities have been ravaged by the inhabitants of modern towns and villages, who have ruthlessly torn down the ruins to provide material for building their houses. Hence, in the North Inspectorate, the great trouble is to protect the ancient sites and prevent the taking of earth and the sale of materials, and to keep at bay the curio hunters and their agents, who, in many places, have organised marauding bands for the spoilation of cemeteries, showing fight when surprised by the Government watchmen. In this part of the country a small necropolis in the Gebel Abou-Féda, near Koseir-el-Amarna, and the small Temple of Ménephthah at Echmonnein have been cleared out, in addition to the repairs at Abydos previously mentioned. More work would have been done at the latter place but for the simple reason assigned by M. Maspero—"*faute d'argent.*" The state of the laws and the general prejudice existing in favour of the curio poacher are great obstacles to the preservation of the antiquities. It is satisfactory to learn that a new law, intended to regulate various questions connected with antiquities, was drafted in 1902, and since then has been considered by the Government. In order to apply this law to Europeans, however, the consent of the fourteen Powers will be required, and, Sir William Garstin remarks, "this consent will necessitate a very considerable lapse of time to obtain." In the meantime the best policy for the authorities is to afford more generous financial support to the Antiquities Service, so that the monuments and other treasures scattered over the face of the country may be still more rigorously watched.

A considerable amount of attention was devoted by the Service to the exploration and clearing of buildings at Sakkarah, in consequence of the previous examination of various remains in this vicinity. M. Maspero had already formed certain theories in connexion with the Royal Tombs of the Memphitic epoch, and the work of clearing, around the Pyramid of Ounas in particular, was undertaken partly for the purpose of throwing light upon the correctness of these theories, and partly to enable tourists visiting Sakkarah to form a more complete idea of the original aspect of the buildings in the immediate vicinity of the Pyramid. In 1902 the Pyramid itself was completely exposed, and good progress was made with the clearing of the chapel and the vestibules attached to this building. In the course of this work four hypogæa were discovered containing a number of valuable relics, comprising blue enamelled statuettes and funeral amulets of gold, gilded silver, and precious stones. But the great discovery of the year was made in the Eastern Galleries. M. Maspero had been struck in the previous year with the extremely ancient appearance of these galleries, and this characteristic suggested to him the possibility that they might belong to some period still more remote than the Pyramid of Ounas itself. The officials collected several helmets of clay, identical with those found by Professor Flinders Petrie and M. Amelineau at Abydos, and bearing the names of two very ancient Kings, Ranibou and Hatpousakhmoui. Thus the archaic period comes to light at Sakkarah as well as at Said, and it is now considered advisable to re-examine all the diggings of M. Mariette in the plain of the Pyramids, with the object of bringing to light the Thinite relics which were most probably overlooked by that explorer.

At Karnak the repair of the columns in the Hypostyle Hall and the clearing of the South-east Court has been continued by Government officials. New foundations for the eleven columns were completed in 1902, and stood the test of the inundation, after which the columns were rebuilt up to the height of 6 mètres, their final completion having been deferred until the autumn of 1903. The excavations in the South-east Court have resulted in several interesting discoveries, among them some twelve rose granite colossi, one of Ousirtasen IV., a hitherto unknown Pharoah of Dynasty XIII., some limestone blocks covered with magnificent sculptures from a temple of Dynasty XII., and a building of Amenothes I. Thoutmosis III. evidently set little store on the works of his predecessors, for the statues

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and carvings were used by him as mere filling when the floor of the court was laid. Should more of these remains come to light M. Maspero proposes to reconstruct at Karnak the building to which they belonged, but he fears the others may have been used for the foundations of the Pylon, in which case they would probably be lost for ever.

At Philæ the works had to be pushed on very rapidly, as, owing first to the length of time required for making good the foundations, and then to the outbreak of cholera, nothing could be done till the middle of October, and by December 3, when the repairs were finished, a part of the island was already under water. M. Barsanti, who was made responsible for the execution of the work, took down and rebuilt the pavilion of Nectanebo, of which the columns were tottering, at the same time replacing in their original positions all the blocks scattered about the site. He completed the small Temple of Arsnoufis, cleaned and repointed the masonryof the portico and of the Great Temple, and rebuilt the propylæa of the chapel of Hathor.

M. Maspero carefully inspected the buildings of Philæ in December, 1902, and in the recently-published report he expressed the opinion that every precaution was taken to make the buildings fit to undergo their long immersion in the water, but it appears that some of the sandstone blocks, having been completely dessicated by the dry air through eighteen centuries, absorbed the water with a rather alarming rapidity. In one wall, to the east of the western gate, the moisture showed itself to have risen by capillary attraction as high as 2 mètres or more above the level of the reservoir. The effect of the water on the soil was also very marked. In some places the ground was distinctly softened and yielded readily to the foot, and it is feared by M. Maspero that much of the silt may be carried away, and that the Kiosque of Trajan may suffer greatly in consequence.

Nevertheless, M. Maspero said it was impossible to predict yet what might happen, or to be certain as to the duration of the monuments covering the island, until careful examination had been made after the return of the water to its ordinary level. By this time, we presume, such examination has already taken place, but, of course, the result will not be known until the publication of the next report of the Public Works Department.

In conclusion, we may add that by far the most important work conducted during the year 1902 was the transfer of the National collections from the Gizeh Museum to the new Egyptian Museum building at Kasr-el-Nil, Cairo. Preparations for this work were commenced two years before, and the result was that the whole of the objects of art, many of them of the utmost delicacy, and others of enormous bulk and weight, were transported with astonishing celerity. Most material assistance was afforded by a temporary line of railway connecting the two buildings. For the conveyance of the larger monuments, special tracks and landing stages were constructed on each side of the Nile, and lighters were provided so that the objects could be readily run down to the river, floated across, and carried direct to their destination. The preparation of the summary catalogue progressed *pari passu* with the transference of the collection, and the whole operation was so admirably organised and carried into execution that the public were only excluded from the Museum during three months. The removal of the collection was commenced in December, 1901, and completed by the middle of July, 1902, the arrangement and classification of the objects being finished in the early part of September in the latter year.

Some idea of the number and weight of the different articles may be gathered from the statement that over 500 cases of all sorts and sizes were specially made, and 100 "cafas" were bought to convey pottery. Several of the large stelæ weighed from twelve to sixteen tons each, whilst at least a hundred of the various articles weighed from one to ten tons. The successful completion of so huge a task in so short a time, and without any loss or damage to the collection, entitles M. Maspero to the gratitude of all interested in archæology.

NOTES.

Some Private Bills in Parliament. THE private bills which are to be introduced this session are likely to have even a smaller chance than usual of passing, for the life of the present Parliament is so obviously precarious and certainly will be short. Mr. Paulton has a bill to amend the law relating to trade unions and trade disputes. This may give rise to an interesting discussion, but only a bill introduced by the Government on this subject has any chance of becoming law. The same may be said of Mr. Sinclair's bill to establish a Minister of Commerce, and also of Sir F. Powell's bill to amend the acts relating to the pollution of rivers and streams. It is probable that Mr. Vaughan Davies's bill to enable Parliamentary powers for Wales to be obtained by provisional orders instead of by Statute will require a good deal of support. There is no doubt that too much money is spent in contests in London over private bills. We fail to find in the list of members' bills as yet introduced that of Mr. Fletcher Moulton in regard to the law of light. It would, however, have no chance of becoming law, and if the Institute of Architects desires legislation it would probably be best to endeavour to get the next Government to take up the question.

The Baltimore Fire. WE have the sad news of another great conflagration in an American city, which seems almost a parallel to the great Chicago fire of a good many years ago. Whether, as in the case of Chicago, there was anything in the method and materials of construction employed in Baltimore to render the city peculiarly liable to destruction by fire we do not as yet know; but the recurrence of these great fires from time to time seems to indicate that there has been something much amiss with building construction and building law in the United States in past times, of which they are now reaping the disastrous consequences. The scene of the conflagration at Baltimore is situated in the city proper and Spring Garden quarter, in the south parts of the entire city, and adjoins the west side of the now embanked stream known as Jones's Falls, which, running north and south into the basin of the harbour, divides the thirty-two square miles of the city into two nearly equal portions. The area laid waste extends some three-quarters of a mile westwards from Jones's Falls to Liberty-street, where the fire broke out in, it is said, the basement of Hurst and Co.'s store, and about half a mile, north and south, between Fayette-street and Pratt-street respectively. Within that space lie the Central Markets, Customs House, Stock Exchange, Post-office, City Hall, and Corn and Flour Exchange; the Equitable, Calvert, and Continental Trust Company's buildings; the Baltimore and Ohio Railroad offices, Holliday-street Theatre, several leading newspaper offices, large hotels, and other important buildings, together with the business and commercial quarter of the city, including the lumber district near O'Donnell's Wharf.

The Garden City. THE experiment called the Garden City is one of such great importance that its progress will be watched with the utmost interest and sympathy. But, however desirable optimism is, it is equally desirable that the difficulties to be overcome should not be lost sight of; otherwise, if the scheme does not fulfil all the hopes of the promoters, many good results and suggestions to be obtained from it may be overlooked. And we cannot but fear that the promoters have scarcely realised the difficulties of their scheme. In our last issue, for example, a sanguine correspondent points out how a manufacturer "who moves to the Garden City" will have many advantages—a cheap site, no premium to ground landlords, etc. But manufacturers do not lightly "move" their factories, and they look in so doing for such points as good railway and canal access, good coal supply, and so forth. Sunlight City, otherwise the factories and houses belonging to the Sunlight Soap Company, is placed on the banks of the Mersey, so that the company's works are in direct communication with the sea traffic of the world. A pleasant agricultural site in Hertfordshire has no such advantages. Again, is a healthy manufacturing city a garden city at all? Is not the name a little too ideal?

Householders and Nuisances. SEVERAL cases have come before the courts recently on the question of what degree of inconvenience individual householders must suffer from machinery employed for public purposes being used in their vicinity. The latest case is Colwell *v.* St. Pancras Borough Council. In May, 1903, the defendant Council began to use new machinery in a generating station for electric light. The plaintiffs, certain lessees and occupiers of neighbouring houses, complained of the nuisance caused by the noise and vibration, and eventually took proceedings. The only substantial defence was that the inconvenience was only temporary, and that the defendants only required time to enable them to experiment and cause the engines to

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run smoothly. The court, however, held that the annoyance was not temporary, but was calculated to work material injury to the plaintiffs' property. It is to be observed that in this case the provisional order under which the defendants' undertaking was carried on expressly left their common law liabilities unaffected, and hence no difficulty arose, such as occurs when work is being done in pursuance of statutory powers in determining to what extent the inconvenience attending the working of the undertaking is authorised by such powers.

By-Laws and London Lodging-houses.

TWO IMPORTANT cases have been decided on the validity of certain by-laws made by local authorities under section 94 of the Public Health (London) Act, 1891, Nokes *v.* Mayor, etc., of Islington and Stiles *v.* Galinski. The by-laws regulate the cleansing and ventilation of lodging-houses, and in both cases "lodging-house" is defined by the by-laws as including "a house or part of a house which is let in lodgings or occupied by members of more than one family," and in each case the by-laws provided that the landlord should in the month of April in every year cause the premises to be cleansed, whitewashed, etc. In Stiles's case the by-laws defined the word "landlord" as "the person (whatever may be the nature or extent of his interest in the premises and whether he resides on the premises or not) who receives or is entitled to receive the rack-rent." In the Islington case the definition was rather wider, embracing anyone by whom or on whose behalf the premises or part of them are let, and who is entitled to receive the profits. The Divisional Court have decided against the validity of the by-laws in both cases on the ground that under them persons not morally responsible are made liable to penalties without notice of the breach of the by-laws. It is to be observed that the by-laws include any houses occupied by more than one family, and, as Mr. Justice Wills pointed out, this would include houses of a high class let to several professional men and in such cases the person receiving the rack-rent would be placed under an intolerable burden of supervision. If the by-laws only included lodging-houses of a particular class, and made the "keeper" or some person morally responsible liable, after notice, for their breach, there seems no reason to doubt they could legally be so framed. It was contended that the particular time of year fixed by the by-law was also unreasonable, but the majority of the Court negatived that contention.

No. 27, Upper Baker-street (Mrs. Siddons's Home).

THE demolition of Mrs. Siddons's house in Upper Baker-street forms a beginning of the clearance that will be made between Clarence Gate and the Marylebone-road for the reconstruction and enlargement of Baker-street railway station. No. 27 stands at the angle of Upper Baker-street and Allsop-place. Mrs. Siddons removed thither in 1817 from the Farm at Westbourne Green, and resided there until her death in 1831. She had taken a formal farewell of the stage on June 29, 1812; her latest appearance in public, at Covent Garden, as "Lady Randolph," took place on June 9, 1818, when she was living in this house. In the garden there she built the annexe for her sculpture studio and dramatic readings, which faces the entrance into Regent's Park at Clarence Gate. It is said that the opening at the end of Cornwall-terrace was planned by Nash, at the Prince Regent's request, in order that Mrs. Siddons might enjoy an uninterrupted view of the park and the country beyond. She left her interest in the lease of the house to her daughter Cecilia; at the sale of the effects in November, 1897, some articles were disposed of that had belonged to her, and were associated with her career as an actress; the painted glass on a window of the staircase had been designed by her. Until lately the house was occupied as the Portman Estate office.

Royal Academy Lectures.

THE main object of Mr. Colton's lecture on Sculpture on Monday afternoon was to impress on students that sculpture was a most difficult and exacting art, not to be approached but in a spirit of labour and self-sacrifice, and which must to a great extent be its own reward. A student who had not enthusiasm for sculpture had better pause before committing himself to it. In sculpture there was no question of real or ideal, for absolute imitation of nature was required; and if one could get near to reproducing the material beauty of nature one might be thankful; though he observed later (and quite truly) that the subject of a work of sculpture should be an idea rather than a fact. A sketchy style was impossible for sculpture, unless you could insure it being never seen but from one point of view. Clear vision and precise and finished execution were, however, of more value than imagination. We should prefer to say that imagination is of little value without these faculties; indeed, Mr. Colton put it at the close of his lecture in words we entirely accept —viz., that sculpture should represent a fine thought finely executed; but once the thought was captured, the rest was *craftsmanship*; and a little thought finely executed was better than a great one badly told. Rules of the proportions of the figure were out of date; they had done much to kill life out of the art in past times, and the works done under that influence had mostly lost their interest now. In this connexion, also, it was an advantage that the Academy had no "system of modelling"; systems were a clog to art, a temptation to mistake the means for the end. Referring to some questions of technical treatment, he was afraid that bones were the bugbear of the modern English school of sculpture. They must, no doubt, know the bone framework of the body, but they must remember that it was everywhere covered with skin, even where it came nearest the surface; and they had to give to the torso, and to the hands and feet (the latter too often carelessly treated in modern sculpture) the suppleness of life. Sculpture was nothing if not vital; let them beware lest in copying life they ended in representing death. Referring to an absurd recent criticism to the effect that there were no limitations in sculpture but the will of the sculptor, Mr. Colton gave some amusing examples of what this doctrine might lead to if acted on. The beauty of nature, however, was so various and so abundant that a sculptor could never hope to touch any but a small part of it. In answer to the lecturer's appeal "Why was nature made beautiful?" however, we should be inclined to suggest that this is confusing cause and effect. Blue sky, and green foliage, and the human form at its best, are beautiful to us because our whole nature and sympathies have been fashioned by our surroundings; whether they are beautiful in the abstract, or whether there even is such a thing as abstract beauty, might be a question. But probably most artists would give the reply of Horatio—"It were to consider too curiously, to consider so."

The Goupil Gallery.

AT the Goupil Gallery there is a collection of oil-paintings, chiefly landscape, by Mr. G. Leon Little, an artist of whom we have not heard much, though he has, we believe, been an occasional exhibitor at the Goupil Gallery, but whose work fully justifies a special exhibition. These are pictures in the best school of landscape-painting—the school of broad execution in which the spirit of the landscape is given without any prosaic realism, though without any of that exaggerated coarseness of style which is affected by some of the most "modern" landscape artists. The first work in the catalogue, "Mowing Barley," a small landscape with horses in the foreground, shows at once the feeling of a true landscape artist. In this and many other works in the room one recognises that the artist has not only the sentiment of landscape, but that he possesses that sense of style which is apparent in the fact that everything is in keeping; the degree of convention which is chosen is consistently maintained. This is especially well illustrated in "Under the Trees" (4), perhaps the best work in the collection in an artistic sense, though there are others which are more effective in the picture-gallery sense. There is a certain suggestion of the manner of an older day in the charming picture "The Farm Pond" (19), in which the treatment of the trees somewhat recalls Gainsborough, though it is not so conventional. There are a few among the smaller works which are inferior to the others, but of the collection as a whole it may be said that almost every one is worth looking at. Among those which we specially liked, in addition to the examples already mentioned, are "Evening" (26); "The Quay, Rye" (28); "Mid-day, Rye" (2), admirable in its sense of colour; "A November Evening" (12); and "Cliburn Moss, Westmoreland" (49).

Drawings at the Leicester Galleries.

A MIXED collection of drawings by eminent artists at the Leicester Galleries is chiefly remarkable for a collection of the drawings of Mr. Frederick Sandys, which occupy the greater part of two walls of the room. These are mainly drawings of ideal women and girls, occasionally with the name of a recognised mythological personage, as "Cassandra," but for the most part ideal figures which

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speak for themselves, and in which the titles serve only to indicate the mood in which they are to be taken. These drawings are remarkable not only for the beauty of the heads, but for their extraordinary and exceptional execution, the method of which it is rather difficult to understand, and which seems different from anything else one has met with. It appears to consist, in some cases at any rate (such as the hair in "Gertrude"), in light colour tints worked over with a fine pencil; the result is a most delicate and unusual effect. In "My Lady Greensleeves," a child figure, the manner in which the lights and texture of the satin dress are conveyed is most remarkable, and quite a puzzle in regard to method, though there is no appearance of anything laboured about it. Mr. Sandys has had evidently a kind of inspiration of his own in technique, and we are indebted to the managers of the gallery for giving us the opportunity of seeing so much of the collected work of an artist of such curious individuality of genius. Among the other drawings the most noteworthy are the series of symbolical heads in coloured chalk by Mr. Henry J. Stock, which represent a new departure in the work of an artist who has so long endeavoured, with varying but sometimes with unquestionable success, to make the figure the medium for expressing a highly idealised poetic conception.

Mr. Abbey's Shakspeare Illustrations.

In another room in the same galleries is a large collection of drawings illustrating the comedies of Shakspeare, by Mr. E. A. Abbey. These are, we take it, all drawn rather large (in comparison with their degree of finish) for reduction as book illustrations, hence they look somewhat rough and straggling in execution. This one can understand and allow for; but taking them as representations of Shakspeare's characters, they are very disappointing—or would have been if what we have already seen of the artist's published illustrations of this class had not forewarned us. Mr. Abbey has painted several very fine pictures on a large scale from Shakspeare's tragedies; but when he illustrates the comedies in this book-illustration form he seems to lose all perception of the dignity which belongs to the more important personages represented in them. He shows us Portia, a great lady who was courted by princes, as a pretty middle-class girl with no manner; Falstaff (who with all his vices was a gentleman) as a fat tavern clown; Malvolio as a kind of scarecrow, whereas Malvolio was a highly respectable person; Maclise's picture is a far better realisation. Parolles is made a kind of roaring Bobadil—in reality he was a great dandy—"that Jackanapes with scarfs," he is called in one scene; and Orlando, in the scene just after he is supposed to have thrown the Duke's wrestler, is such a wretched creature that one would think a feather would knock him down. In short, Mr. Abbey understands Shakspeare's tragedy but he does not understand Shakspeare's comedy, and turns it into burlesque. By far the best thing in the collection is a scene which is essentially tragic—that where Angelo expresses his guilty passion to Isabella. Here the evil face of the man and the horror of the nun as she comes to realise his meaning are expressed with great power, and Mr. Abbey might make a very fine picture out of this study. Among the rest, he has given us a very pretty Anne Page, and he has made something of Caliban; but in the main we should say that these drawings are not so much Shakspeare illustrated as Shakspeare travestied.

THE ARCHITECTURAL ASSOCIATION.

An ordinary fortnightly meeting of the Architectural Association was held on Friday evening last week in the Meeting Room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W. Mr. Arnold Mitchell, Vice-President, took the chair, and explained that Mr. Hare, the President, was sorry not to be with them that evening. Mr. Hare had been unwell, and, though better, he had no voice and felt he would not be a proper chairman for the occasion.

The minutes and some nominations having been read, the following gentlemen were elected members of the Association:—Messrs. L. F. Jones, W. S. Gorringe, W. Acworth, W. W. Scott-Moncrieff, H. I. Merriman, J. S. Courtauld, and J. L. Fouracre.

New Premises Fund.

The Chairman then announced the following further donations to the New Premises Fund:—Messrs. Mark Fawcett and Co., 21*l.*; J. K. Hunter, 2*l.* 2s.; Arthur J. James, 2*l.* 2s.; R. Douglas Wells, 2*l.* 2s.; A. E. Anscombe, 1*l.* 1s.; A. Campbell, 1*l.* 1s.; F. G. Christmas, 1*l.* 1s.; B. Dicksee, 1*l.* 1s.; A. Ebbs, 1*l.* 1s; and Horace Barry, 1*l.*

A Bequest.

The Chairman also announced that 750*l.* had been bequeathed to the Association by the late Mr. H. Saxon Snell for the foundation and maintenance of a Triennial Scholarship. Details had not yet been received, but it was an agreeable announcement to make that so generous a donation had been made to the Association.

Mr. Louis Ambler, Hon. Secretary, proposed a vote of thanks to Mr. John Belcher, A.R.A., for allowing a party of members to visit the Royal London Friendly Society's Offices; also to Mr. A. H. Belcher for kindly attending the visit on Saturday, January 23. The vote of thanks having been accorded,

Mr. Ambler announced the following donation of lantern slides:—Thirty-six slides of Gothic work, presented by Mr. G. S. Fleetwood; thirty slides of Gothic work, presented by Mr. F. R. Taylor; and sixty slides of Westminster Abbey and St. Paul's, presented by Mr. Alan Potter.

A vote of thanks was passed to the donors.

It was also announced that a Discussion Section meeting will be held on February 17, when a paper by Mr. Walter Williams will be read on "The Legal Position of an Architect."

Cottage Homes.

Mr. W. A. Harvey then read the following paper, entitled "Cottage Homes," which was illustrated by a large number of lantern views:—

The subject of Cottage Homes that you have done me the honour of inviting me to speak upon this evening I cannot approach without being apprehensive that it is one with which my audience must already be well conversant; and, in submitting to you, for your consideration, observations resulting from my own experience, it must not be imagined that I regard them as being pregnant with originality, or yet that I presupposo the ignorance of my listeners.

It is my intention, as will probably have been anticipated, to take as the reference basis of my remarks the project in which I am directly interested. I refer to the scheme of the Bournville Village Trust, whose architect I have been since its inception.

By way of introduction, let me briefly state that the village of Bournville, which lies in the north-east of Worcestershire, four miles south-west of Birmingham, is of quite recent development, nearly the whole of it having been built since 1895. The estate, which is now administered by a trust, owes its existence to Mr. George Cadbury, of Northfield, the senior member of the firm of Cadbury Brothers Ltd. Mr. Cadbury's object is an endeavour to alleviate the evils which arise from the insanitary and insufficient housing accommodation supplied to large numbers of the working classes and to secure to workers in factories some of the advantages of outdoor village life, with opportunities for the natural and healthful occupation of cultivating the soil. When the village was handed over to the trustees in December, 1900, something like 350 cottages had been erected. Since then building has been steadily proceeded with, the total now being over 500. Most of those built before 1901 have two sitting-rooms, a scullery, three bedrooms, and the usual conveniences. Larger ones of later date have four, five, and six bedrooms, and a bathroom supplied with hot and cold water. During the last two years several cottages have been built with one large living-room instead of two smaller ones, a scullery with bath sunk in floor, or disposed of in other ways, to economise space, three bedrooms, and in some cases an attic. Others are now built with two bedrooms, for small families.

There is an average garden space allowed each house of 600 square yards, which is found to be as much as one man can attend to. The rents range from 5s. 6d. a week, rates included, to 12s., rates not included, and there are a few houses of a larger class at higher rentals. The village is served by Birmingham with gas, water, and sewers, the rates being about 6s. 6d. in the pound, exclusive of water rate.

Although much has been said of higher percentages, 4 per cent. on the outlay is the most that should be expected in building houses of this class, the same meeting the demands both of satisfactory accommodation and artistic appearance. The profit on the outlay is often exaggerated, and it might be well to point out that 6 per cent. gross will rarely pay 4 per cent. net, as is often stated. It is true that a greater profit may be made by erecting houses in endless rows to an unsightly stock pattern; but I strongly urge that the only legitimate way of diminishing cost is by the avoidance of unnecessary ornament and by the advancing of a pleasing simplicity. The jerry-builder introduces considerable ornament in detail, which, though neither necessary nor beautiful, must yet cost him something, and it is in attention to such matters as this that the difficulty may be largely overcome.

In building a street of houses the expense would, of course, be very great if, to get variety, we employed a different plan and different details for each house. We have to recourse to other methods. In the case of fifty houses I might suggest getting as many details, such as windows, doors, and door-frames, the same (or, at any rate, half of one kind and half of another), and should avoid the monotony by a variation of the disposition of these features. An extensive elevation may also be made interesting by the treatment of a porch here, the addition of a bay window there, and the use of rough-cast somewhere else. Go in for the most irregular building line you possibly can. In a block of three cottages a pleasing effect is gained by projecting or recessing the middle one, or putting long way on, and so forming a fore-court in front.

If it be resolved that a row of houses shall have ornament to make it attractive, I would suggest that something not too small and crowded be distributed here and there—say, on the first and third houses—the unadorned ones affording relief to the others. I might mention that if an architectural village had been the main object at Bournville, more money had been spent on detailed enrichment. After all, let money be sown lavishly, and in this spring-tide revival of architectural art Utopia itself may spring up!

The idea of a cottage home that I have always endeavoured to keep in view is one in which beauty is based on utility—a principle which should guide all art, it is true, but which, in order that a plebeian and vulgar taste for shoddy display may be gratified, has been too often violated—and though with the artisan class it is perhaps most difficult to gain this end, an adherence to it must sooner or later tell. On the whole, my experience at Bournville has been that the residents in the cottages have shown a remarkable readiness to catch the idea and spirit of a homely simplicity, and it is evinced in such details, for instance, as their manner of furnishing the rooms, in their adopting suitable and artistic

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curtains to the casement windows, etc. Another point I have endeavoured to keep in view is the advisability of building more permanent dwellings than those we so commonly see erected in these rows. Many of these are the work of a speculative builder, who sells as soon as the slates are on to one who will probably sell again, someone in the end suffering considerable loss. To say that care should be taken to well ventilate floors is almost a platitude; nevertheless this is sometimes overlooked in the effort to save a trifling expense, in spite of the fact that in the long run, when dry-rot sets in, a considerable expense is inevitable. There should be a bed of concrete over the whole site, and plenty of air bricks should be employed to thoroughly ventilate ground-floor joists, and the same (or whatever ground work is used under joists) should be, if possible, above the level of the ground round the house. This prevents any chance of water collecting under floors. There is an increasing demand for a substantial home, and in time—let us hope soon—it will be such that must be supplied.

My object being to deal with cottages the cost of which is from 175*l.* to 750*l.*, I take first the accommodation of one of the smallest types, erected in blocks of four:—

Ground Floor:—
Living-room, 13 ft. 6 in. by 12 ft. 6 in.
Scullery, with cabinet bath, 10 ft. 6 in. by 7 ft.
Larder under stairs.
Coals and water-closet.
Small paved yard.
Lobby.
Size of garden, 600 square yards.

First Floor:—
Front bedroom, 13 ft. 6 in. by 12 ft. 6 in.
Back bedroom, 16 ft. 6 in. by 7 ft.
Small linen closet.

Total cost, including laying out of garden and all extras, 175*l.* per house.

Estimated net return, 7*l.* per house. A return is, therefore, obtained of 4 per cent.

Cubical contents, 8,023 ft. per house, at 5¼d. per foot (in 1903) = 175*l.*

At Bournville 8 per cent. gross yields about 4 per cent. net.

This type is of the smallest possible dimensions and simplest construction; the roof runs uninterruptedly from end to end, and the building throughout is of a very inexpensive character. In this class of design every simplicity should be studied; unnecessary roof complications should be avoided, and the chimneys, in order to diminish trimming, flashing, etc., grouped together and brought to the highest point of the roof to avoid down-draughts and cold, smoky flues. It is not essential that each bedroom should have a fireplace if efficient ventilation is provided. Nooks and recesses doubtless make a room interesting, but in small cottages of this kind they are too expensive to introduce, and, instead, the best must be made of materials, colour, and proportions, if we are to make 4 per cent. on outlay.

A very important point to emphasise regarding cottages of all sizes is *compactness of plan*, and there should be an aim at getting wall lines as long and as unbroken as possible. Where possible all outbuildings should be arranged under the main roof, otherwise when cottages are semi-detached one of them must suffer through the projecting roof of the other. This precaution also admits of a better view of the garden from the living rooms, and the glimpse of green is no small consideration in the building of cottage homes. Care should be exercised in the planning of corner cottages to avoid the yard being exposed to the road, and where necessary it should be enclosed. The flaunting pageantry of the week's wash may be meet perhaps for the eyes of the matron of the tub, but for the public it is generally considered an eyesore.

Aspect and prospect in small and large houses alike should have careful attention, and it should be remembered that the position of the larder, which, when possible, should be north or north-east, is of no small domestic importance.

Another type is as follows:—

Ground Floor:—
Living-room, 17 ft. by 16 ft., with ingle-nook and bay.
Scullery, 13 ft. by 10 ft. 6 in., having bath sunk in floor.
Larder, 5 ft. by 6 ft.
Coals, water-closet, and small paved yard.
Verandah in front.

First Floor:—
Bedrooms, 17 ft. by 13 ft. 6 in., 8 ft. 6 in. by 9 ft. 6 in., and 13 ft. by 8 ft. 6 in.
Small box cupboard.
Attic, 16 ft. by 17 ft.

Total cost, about 300*l.*

In view of the advantage of one spacious and healthy living-room over the parlour plan, this class of cottage has been largely introduced at Bournville. The dweller in this home must get far better value for his rent than that artisan of the suburb of mushroom growth in his cramped villa. Is it not piteous to think that the front parlour, silent and musty during the week, should know the amiable chatter and cheerful blaze of the fire but for six hours on the Sunday? A pleasing writer (Mr. G. K. Chesterton), writing not long since upon a debate in the London County Council upon the Housing Committee's report, urged that this drawing-room, with its wax fruit and other gimcracks, represents the art instincts—or, as he called it, the religion—of the artisan, and he became eloquent in denouncing its abolishment. Surely he was in jest. For could not a corner in his more spacious room be yet preserved for such treasures, and the tinkle of the hymn tune be heard to greater advantage withal?

I consider that the heights of 8 ft. 6 in. for ground floor and 8 ft. for bedrooms are quite adequate for the average cottage, so long as sufficient ventilation is provided. Floor space is the most important consideration in the economic building of cottage homes.

I might say here that the cottage with the long sloping roof, of which I have many examples at Bournville, has one great advantage, for if the front walls were carried up level with the ceiling line of bedroom, besides the building suffering in lack of proportion the expense of extra brick-work is considerable. Generally speaking, the height of bedrooms to the point of intersection of the roof and wall need be no more than 5 ft. 6 in. Ample ventilation may be got by the simple insertion of a 9 in. by 7 in. air brick on the outside wall, and a tobin tube within, about 5 ft. 6 in. from floor, the cost of the latter being only about three shillings.

The bath, now justly regarded as an essential in every house, is, where the cottage is not of a size to admit of a bathroom, either sunk into the floor of the kitchen near the hearth, which is covered by what may be used as a standing or draining board, or, if sufficient room, not sunk, but covered by what may be used as a settle or table. In some cases the patent adjustable bath has been used, the same being hinged at the bottom of one end in order that it may be raised and lowered from a cabinet, the upper portion having shelves and forming a cupboard, where it is kept in a vertical position, much room being saved thereby, the cost being about 3*l.* 5*s.* In other cases the admirable arrangement of Corne's Combined Scullery-Bath-Range and Boiler has been introduced, which I can well recommend. The patent, one well thought out, utilises to its fullest extent the heat of the kitchen, and, while a great economy of space is effected, there is considerable saving of fuel to the householder. The heating and cooking range forms a great part of the division between the kitchen and scullery-bathroom, the flue being coursed over the head of the bath. In the centre of the range is the grate, with an oven on one side and a twelve-gallon boiler, in which water is kept hot for domestic purposes, on the other. Boiling water can be obtained by raking down live fuel into a small secondary grate under the boiler through a small hole made for the purpose. Clothes can be boiled in the boiler, with which, owing to its open construction, there is no risk of explosion. Access to the boiler from the scullery is gained by opening a curved door, and further developments have been made in the way of providing a folding door in front of the range, which will shut off the boiler from the kitchen when necessary. The scullery-bathroom, which contains about 36 superficial feet, is fitted with a full-sized iron enamelled bath, supplied with hot water by a pipe from the range boiler and with cold water from the cistern, or through a shower-bath sprinkler fixed overhead, so that this latter luxury can be enjoyed by simply turning the tap.

I have found the introduction of White's Patent Steam Exhaust advantageous and efficient in preventing steam permeating other rooms.

The following is an example of a cottage where a clear 4 per cent. is made on the outlay. A large number have been built to this plan at Bournville. The accommodation is:—

Ground Floor:—
Parlour, 13 ft. 6 in. by 11 ft. 3 in., and bay.
Living-room, 14 ft. 6 in. by 11 ft. 9 in. (French window).
Kitchen, 12 ft. 3 in. by 10 ft. 6 in.
Larder, 6 ft. by 6 ft. 3 in.
Porch and hall, and cloak space under stairs.
Tools, water-closet, and coals, enclosed yard, and 600 square yards garden.

First Floor:—
First bedroom, 13 ft. 6 in. by 11 ft. 3 in.
Second bedroom, 14 ft. 6 in. by 11 ft. 3 in.
Third bedroom, 10 ft. 6 in. by 8 ft. 3 in.
Bathroom (hot and cold water).

Total cost, including laying out of garden and all extras, 395*l.* per house.

Estimated net return, 16*l.* per house.

A return therefore is gained of 4 per cent.

Cubical contents, 26,885 ft. cubic, at 5¼d. = 404*l.*

The hearth, which should be the holy of holies in the home, is worthy of the architect's most careful attention, even in the smallest cottage. It should in itself convey the suggestion of comfort, and it might be remembered that the most inviting hearth is not that which is surrounded by artistic extravagance. Fireplaces I consider suitable for the six-roomed cottage are as follows: For front room, interior, slabbed surrounds, tiled hearth, and white wood chimney-piece; dining-room, iron tiled mantel-sham; kitchen, 3 ft. range, with white tiled coves and York stone shelf and trusses; front bedroom, 30-in. mantel-sham and tiled hearth; back bedrooms, 24-in. mantel-sham and tiled hearth; the total cost of the whole amounting to 12*l.*

I should like to say a word in favour of the casement window. It is not only cheaper than the sash window, but if in the building of a small cottage beauty of effect is *demanded* it is expressly cheap. Whatever the æsthetic principle be, there is something (perhaps it is its simplicity) so homelike in its appearance, which makes it infinitely more fitting than the sash species. Behold Juliet bending to Romeo from a sash window! The old difficulty of cleaning may now be obviated by the very simple device of causing the window to open upon a pivot in the centre, inwardly as well as outwardly, which permits the whole of the outside of the fixed pane to be reached easily by the hand.

A good window-sill is formed of calf-nosed bricks set on edge in cement, with two courses of tiles beneath, which forms a drip under sill, and a backing of slate, also in cement. By bringing the window-frame forward to reduce the size of top of sill damp and the driving in of rain at this point, the curses of small property, are prevented. This makes an inexpensive sill, and, adding as it does to the appearance, is very suitable for cottages.

The following is the accommodation of a single cottage:—

Ground Floor:—
Drawing-room, 13 ft. 6 in. by 12 ft. 9 in., and bay.
Dining-room, 13 ft. by 13 ft., and bay.
Kitchen, 10 ft. 9 in. by 10 ft.
Scullery, 7 ft. 6 in. by 10 ft.
Larder.
Porch and hall, cloak space under stairs.
Coals and water-closet.

First Floor:—
First bedroom, 13 ft. 6 in. by 17 ft.
Second bedroom, 13 ft. by 11 ft.
Third bedroom, 12 ft. 3 in. by 10 ft.
Dressing-room, 7 ft. 6 in. by 7 ft. 6 in.
Cupboards.
Bathroom, with water-closet, and lavatory (hot and cold water).

Total cost (1899), about 600*l.*

The accommodation now given is of a larger class of cottage:—

Ground Floor:—
Drawing-room, 11 ft. 9 in. by 13 ft. 6 in., with 4 ft. 9 in. by 10 ft. ingle and bay window.

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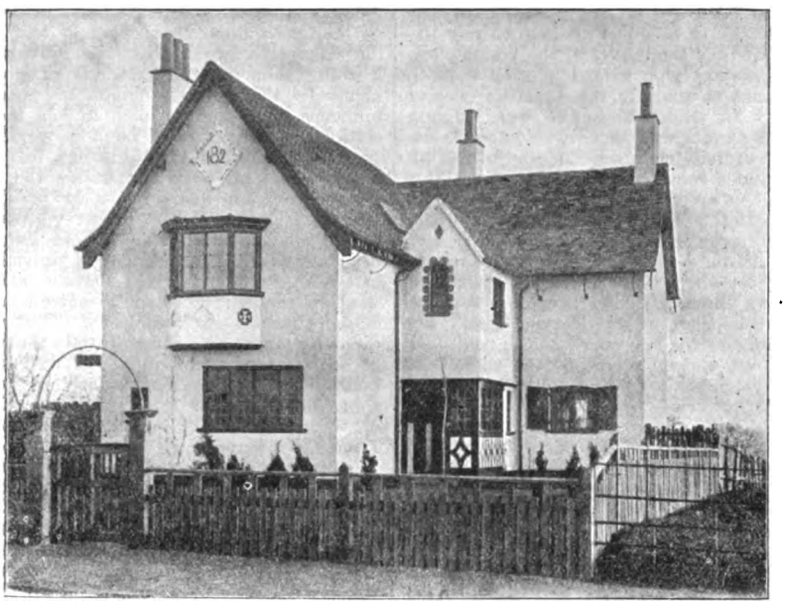

House at Northfield.

Dining-room, 16 ft. by 13 ft. 6 in., and bay.
Kitchen, 12 ft. by 10 ft.
Scullery, 9 ft. 6 in. by 9 ft. 6 in.
Larder.
Water-closet and coals, and tool-house.
Porch, hall, and small cloak space.
Frontage, 15 yards.

First Floor :—

First bedroom, 16 ft. 6 in. by 12 ft.
Second bedroom, 12 ft. 6 in. by 13 ft. 6 in
Third bedroom, 13 ft. 6 in. by 9 ft.
Fourth bedroom, 10 ft. by 10 ft. 6 in.
Box-room, 9 ft. 6 in. by 8 ft. 3 in.
Bathroom.

Total cost (1899), about 650*l.*

My object in giving these different accommodations is to show what can be given in the way of substantial dwellings for the amounts given.

In this case the outlook at the back of the house is to be preferred to the front, and, as should always be done providing the aspect is favourable, the principal rooms are placed at the back.

As to wall decoration in interiors, for small cottages I have found it advisable to use papers instead of colour wash, for the latter is very soon soiled where there are children. In the better houses a colour-wash may be at first used and a paper added later, with a frieze. A good effect is also obtained by bringing down the white from the ceiling as far as the picture rail, which gives light to and improves the proportions of the room. Picture rails should be placed in the smallest houses, if only to save the plaster. I generally place them level with top of architrave of door.

With regard to bricks, as far as possible I make a point of avoiding those which are mechanically made (the pressed stock brick) and use the brindled Staffordshire ones. They are more suitable for cottage building, for a pleasing variety of colour is introduced at a low cost, the tint sbeing a bright cherry red blended with purple and blue—the last of which is quite different from the indescribable vitreous blue. I prefer to use the hand-made roofing tiles and thick Welsh green Precelly slates, and occasionally the rustic peggies.

Roof-ridging, though seemingly a small matter, should have careful attention, and in my opinion it is wiser to suppress the same rather than to sharpen it, for by so doing a much-desired homely appearance is lent to the cottage. Many fantastic ridges, with vulgar finials, are employed in the building of small suburban villas, of a more or less sharp pointed character and of a depth out of proportion with the roof, which gives an unpleasant harshness to the general appearance. With the principle in view that the sky-line should be softened as much as possible, I invariably use the brindled hand-made half-rounds. With green slates I use blue ridges, as being the most suitable colour, and one which defines without undue severity.

There is a strong temptation to introduce a variety of colours upon exteriors, but with cottages of the class I deal with it is advisable to refrain from so doing. My experience has been that it is best to get the colour in masses, treated broadly, not in bits—say, each house of one colour; for where the cottages stand close together, or even where they are semi-detached, the contrast or relief is borrowed from the neighbouring one, and in the case of a village a much better general effect is thus gained. With whitewashed houses a tarred plinth of about 2 ft. is pleasing, and prevents the rain and mud splashes from being seen.

With regard to the thickness of walls, my opinion is that a 9 in. wall outside is sufficient, and is to be preferred to the cavity wall. South-west fronts should be protected by overhanging eaves, but where this is impossible the face should be whitewashed, by which not only is damp largely prevented, but an effective appearance gained.

As to general timber, I might say that I have used common building red deal, the joinery being of seconds and thirds Archangel, and, where larger timber is required, the ordinary pitch-pine. Oak is advisable for weather-boarding and sills.

Half-timber for exteriors I do not recommend. District Councils insist on a 9-in. wall being at the back; thus not only is its use false art, but an unwarranted present and future expense; an effect equally as good, moreover, is obtained with rough-cast or whitewash. Half-timber one lives to regret, for the weather tells sadly, and it demands constant repair.

A garden arrangement largely adopted is as follows: At the bottom are eight apple and pear trees and fruit trees, which, besides being reasonably expected to bear fruit, form a screen between houses which are back to back. The paths are made of 6 in. of ashes and 3 in. of gravel. The position of the grass plot and ornamental bed at the top permit a little soothing green and flash of colour to be seen from within the house.

Tool sheds should be erected beyond the outhouses, not only because of their usefulness, but as a means of preserving the appearance of the back. The tenant, if these are not supplied, invariably knocks up a disorderly apology from Sunlight Soap cases, and it is best to forestal him.

Given a plot of land upon which four houses are to be erected, it is advisable, in order to more equally distribute the garden space, say, of about 500 or 600 square yards per house, to spread them laterally by arranging the staircase, not between the rooms, but between the houses, thus widening (not lengthening) the building. This, bringing the remote houses nearer the extremity of the land, not only gives the garden plot the preferable straightness, but a breadth of view upon same is obtained from within and the yard space materially widened.

[The paper was illustrated by lantern slides of a number of plans and views, and there was considerable matter relating only to them which does not appear here.]

Mr. E. Guy Dawber, in proposing a vote of thanks to the lecturer, said they had listened to an excellent paper, which had been especially interesting because it gave them the practical experiences of an architect in building these different types of country homes. They had seen in the series of lantern slides houses from the quite small cottage to the more comfortable middle-sized house. They must congratulate Mr. Harvey upon his very beautiful work and upon the exceptionally fortunate position in which he had been placed in having—as they could only think was the case after seeing the lantern views—a more or less free hand in dealing with the various problems. It was most interesting to see what could be done with this class of building at the present day, when left in the hands of a capable architect, and it was quite certain that Mr. Harvey had not been hampered by a lot of restrictions or by a fussy client. The plans of the buildings shown were particularly interesting, and he would have liked to have examined them more attentively than was possible when they had to be passed quickly on the screen. All who had seen those plans must have been struck by the tact with which the houses had been arranged, especially in the case of the very small ones. In country districts, as a rule, there were not many of the larger houses; the three to six bedroom houses; much smaller buildings were the rule, and it was as to those buildings that the much-debated question of the third room, or parlour, arose. In the old cottages they did not have the third room; there was just the one large comfortable room, with the ingle fireplace, and a room at the back where all the culinary work was done, and nothing was more comfortable than that; but at the present day, with people always aiming to

Four Cottages, Acacia-road, Bournville.

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get into the position just above them, no labourer's cottage was considered to be fit without this useless third room. They all must have had experience of the difficulty of getting people in the country to put up with two living-rooms. He knew from personal experience that people, like gardeners and coachmen, thought it undignified and derogatory to their position not to have this third room. He would like to know from Mr. Harvey what class of people, and what their wages were, who lived in these two-roomed cottages. They must all have noticed and must have envied Mr. Harvey that he had worked in a country where there was a background of fine trees. Trees helped modern buildings very considerably. If they put houses like these on an absolutely bare plain they lost a great deal of the charm which always arose from having beautiful trees in conjunction. He quite agreed with what had been said about windows—a sash-window in a cottage was out of place; the height of the room precluded it, and a casement alone was suitable. What Mr. Harvey said about 9 in. brick walls seemed to be open to comment. Mr. Harvey said he had always found 9 in. walls sufficient; he could have had no experience of building on the Surrey hills or in the south of England during the last winter! Building as they did, even with 14 in. walls, the rain came through, and what they would do with 9 in. brick walls, unless rough cast, he did not know. He was glad to see that Mr. Harvey had used stock bricks just as they came out of the kiln, of all colours. They always got a texture if they used bricks like that; and if they could not use a material of good colour, there was nothing like whitewash, which always had a comfortable effect, especially when it got toned down. One thing had struck him while he was in France last autumn. In painting houses there, new as well as old, they generally used one tone throughout, matching the colour of the roof, and that gave a very pleasing effect. If we did that more in this country we should get a much quieter effect, especially where, as in cottages, the features were brought together and contracted. The arrangement of placing two projecting cottages as wings by the side of a receding one, as shown by Mr. Harvey, was very agreeable.

Mr. Sydney Vacher, in seconding the vote of thanks, said that Mr. Harvey, in giving them his experience, and in showing them all his plans, sections, and details, etc., showed a generosity which the Association ought to feel indebted for. There was only one point he wanted to refer to, *i.e.*, a difficulty as to the cheap cottage—the cottage letting at 5s. to 6s. per week. The cottages might consist on the ground floor of parlour and scullery-kitchen, stores and staircase, and three bedrooms on the upper floor. Now, the biggest bedrooms cannot be more than 13 ft. 6 in. by 12 ft. 6 in. His example came out 13 ft. 6 in. by 8 ft. 6 in., and in each case there was a cupboard space, say, 3 ft. by 4 ft., over the entrance at foot of staircase. He saw, on referring to his plan, that he got three bedrooms as against Mr. Harvey's two; but it did not matter, for invariably it would be found that one, if not both, of these bedrooms would be let to lodgers—certainly not given up to young children. Now, by increasing the entrance, say, 3 ft. by 7 ft., outside dimensions, and placing the door to room on the slant, this, when carried up, would make a bay that could be screened off by a curtain from the parents' room, and in which two children could sleep; and, having a window in it, more ventilation could be obtained. This feature made a very useful entrance, besides coming very well for the elevation, and was a way out of a serious difficulty at a but very small extra expense. That these people would keep one of the ground floor rooms as a parlour us d but seldom was a fact all architects having to do with cottage work must face; this and their weakness for taking in lodgers were the two chief complaints of the philanthropic cottage builder. He had tried in this cheap property putting a good cooking-range only in the front room (with a good dresser next it), and only a copper in the scullery; but a further cooking-range had to be put later on in the scullery before the cottages could be let to satisfactory tenants.

Mr. H. D. Searles-Wood, in supporting the vote of thanks, said the parlour in these cottages was a white elephant, but one of the difficulties in the way of its abolition was the matter of rent. In his neighbourhood tenants of cottages letting at 8s. 6d. to 10s. 6d. per week were almost bound to take in a lodger to help to pay the rent, and, if they thought of it, the young clerk or shop assistant who lodged in such a place did not want to share in the domestic bliss of the family in whose house he was lodging, and so this parlour was the only room available. While he cordially endorsed the plan of having no superfluous room in these houses, yet this lodger difficulty did away with some of the objections to the parlour. He had a client who refused to have three bedrooms in these houses so as to discourage lodgers, but that gave rise to difficulties where there were children of two sexes, when three bedrooms became necessary. He would be glad if Mr. Harvey would say how he constructed the curve of the roof over the windows, shown in one of the slides. It was always difficult to keep out the wet in such cases.

Mr. Arthur Keen asked whether there was a gutter in the case of the curve of the roof just referred to; and, if there was not a gutter, what became of the water. In most of the cottages, he noticed, the party wall was not carried up through the roof. He supposed the by-laws in the neighbourhood allowed the party wall to be omitted, but in London, as they knew, the party wall had to be carried up, and that added materially to the cost of building. The party wall not being carried through the roof, he would like to know whether it stopped at the ceiling or under the tiles. As to the rents, did they include rates and taxes? They seemed to be low rents in some cases, and if the sums paid included rates and taxes, then they were very low. And was the cost of land covered in reckoning the interest? It seemed difficult to believe that houses, with so much ground, and built so well, and with such good fencing, could pay anything like 4 per cent., and he should like to know if there was a genuine return of 4 per cent.

Mr. Francis Hooper said they welcomed Mr. Harvey amongst them cordially as a provincial brother. He had had the great pleasure of looking round the Bourneville estate last autumn. Although the scheme was a considerable one, if each of their 1,600 members succeeded in securing a client like Mr. Cadbury, and built as many cottages as Mr. Harvey, the problem of housing the people would still not be solved, for it was very vast. Last year they welcomed Mr. Lever, who gave them an account of his generous work at Port Sunlight, from which little attempt was made to get financial return; Mr. Lever practically gave the property to his workpeople, and rents were not fixed on an economical basis. Mr. Cadbury's scheme was a more practical one, and more easy to follow. The scheme was on a sound financial basis, added to which, no doubt, Mr. Cadbury was rewarded to an extent by the satisfaction he must feel in doing good work for his fellow men, and it was to be hoped that he was able to secure the best workmen in the district. From that point of view the scheme might commend itself to other employers of labour, though whether financiers would be prepared to take part, for a return of 4 per cent., in a scheme involving so much work and anxiety was a question. As to party walls, evidently the by-laws in the district were different from what they were in other districts. One pleasant feature was the employment on the estate of almost invisible iron fences which afforded open views so commonly lacking. As to the parlour question, he had the temerity the other day to tell the students of the Elementary Class of Design that the ordinary working-man was so conservative that it was not politic to omit the parlour. Evidently, Mr. Dawber had had to do with some of the same sort of people that he (the speaker) had—those people insisted on having a parlour. If the room were used by parents as one for quiet, forbidden to the children, he could understand it; that would be an excuse for the parlour, for a tired worker needed some such place after his day's work. He congratulated Mr. Harvey on his work and on the simplicity and beauty which characterised it.

Mr. T. C. Yates asked what provision was made on the estate for recreation—for lectures, concerts, etc., and for baths and such like.

Mr. W. Henry White said he would like to emphasise what Mr. Hooper had said as to their pleasure in welcoming a country visitor amongst them. If they wanted to spread the influence of the Association to the provinces it could be done, he thought, by getting country members to come and read papers before them, as had been done that evening, and if they did that they would reap the advantage of learning some of the methods of provincial men. In that way it might be possible to influence more country men to join the Association. Nowhere near London would it be possible to produce anything like this Bournville scheme on a paying basis; the cost of labour and land would utterly preclude it. He knew where some property was being developed in London, and where large sums of money were being expended to provide homes ostensibly for the working classes, and there was not the slightest hope of getting a return of more than 1½ to 2 per cent. That was the difficulty in getting owners to study the question of housing the poor, and he believed that our housing committees could not build on anything like a paying basis; in the early days of the Peabody-buildings and the Industrial Dwellings Company it was possible to do so. In seeing the charming views of these Bournville houses he could not help thinking of our East-end squalor; if some philanthropist would come along and help them, and if something could be done to provide these artistic and healthy cottages for the East-end workmen, it would be a great blessing. But as it is, the everlasting cost of materials and labour was the difficulty, while the working man did not assist in its solution.

Mr. Maurice B. Adams said he should be glad if Mr. Harvey could clear up one little point. As far as he could gather, the estate primarily was intended to furnish residences for Mr. Cadbury's workpeople, but it seemed that other houses were now built for which the same rents were paid as were charged to the employées. At Port Sunlight Mr. Lever's necessity was largely the basis of what he had done, and, as he (the speaker) understood, the returns were regarded in the way of rent in connexion with the amount of wages paid. Mr. Lever, with the requirements before him of providing accommodation for his workpeople, put rent and wages together, although no doubt he had acted large-heartedly as a philanthropist. This question of cottage building was inseparable from monetary considerations, to architects as well as others. It was a difficult problem to build a house to provide a maximum amount of accommodation in a commodious and artistic way for a strictly limited amount of money, and consequently he thought there was some practical use in asking Mr. Harvey the question he had. If houses for other than the workpeople were being erected on the estate at an even rental, were not those workpeople placed somewhat at a disadvantage? Ought they not to have some preference over the mere outsider who came to live in the village, or how was that managed? In some of the flat-covered dormers and in the shaped roofs seen in the views was it possible to afford lead? Or was zinc used? The use of lead added materially to the cost, but in many ways zinc was objectionable and in no way preferable. As to the carrying walls over, as they saw in some designs, that necessitated the use of iron joists or something of that kind, and there again there was an addition to the cost; indeed, they could not get away from the cube or the plain surface wall without adding to the expense; spaces lost between roofs meant expense, although they helped to produce a good effect in the appearance externally. It would have been an advantage to have seen a plan of the estate in order to see how the "triangle" came about and to have learnt something as to the contour of the land. Some of the views suggested a considerable fall in the ground, particularly from the rear of the houses which would seem to help in the matter of drainage; but in some districts it would be difficult to make provisions for the sunk bath, which no doubt was a useful feature. At Port Sunlight he was amused as to the uses some few of the people had put their baths to. In one case the bath-room had been used as a hen-house, showing what some tenants will do.

The Chairman, in putting the vote of thanks, said he endorsed what had been said in welcoming Mr. Harvey amongst them. From his own experience, he could say he had always received a most hearty welcome from Birmingham architects whenever he went there to read a paper. Mr. Dawber raised an interesting point—*i.e.*, as to the way in which an added colour effect could be obtained by very simple means. Mr. Harvey had shown them how he used whitewash on the walls with a tar plinth,

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but if greater harmony could be obtained by colouring the woodwork of doors and windows in the way suggested it seemed a desirable matter to consider and follow, as far as possible; it was a matter which was largely ignored, we were so accustomed to the bright grass-green on the one hand and the plain white on the other. Mr. Dawber's idea was a refreshing one, and would be welcome. As to the by-laws, Mr. Harvey had been most fortunate in that, to all intents and purposes, he had not been hampered by by-laws. They had heard about party walls, and they knew it was a great saving of expense to be able to keep them down as Mr. Harvey had done. In most districts near London they could not build houses close to one another with the delightful little verges shown in many of the buildings they had seen views of. The by laws required parapet walls and the picturesqueness of the verge gable-end was gone. Window frames must be set back, and walls must not overhang. These were some of the ways in which architects were hampered by by-laws, and it was the same as to drainage. He would rather like to know from Mr. Harvey whether 5¼d. was an average price per foot cube. How many of them could build at that rate? He presumed that the houses drained into the sewer. He found that a most economical arrangement of self-contained drainage—and they had to be economical in building these cottages, and drainage was a costly item—was to have an earth closet detached; it might be attached, but it was pleasanter on the whole to have it detached, and then to deal with the other drainage—the scullery sink drainage, which was the most objectionable of all—by having a pail on the outside of the scullery wall with a pipe leading into it from the scullery sink. When the pail was full it could be emptied on to the garden, which was altogether the best arrangement. But many by-laws would not permit this simple expedient, and again and again he was not allowed to have his pail system, an expensive system of sewage disposal, manholes, etc., being insisted on. As to the thickness of walls, he thought that Mr. Harvey was a most fortunate man in being able to build 9 in. brick walls and give his client satisfaction. Were there many of them who could do so round about London? They might be able to do it in stock bricks, but with ordinary red bricks the walls would be as damp inside as outside. While people did not want the 14 in. wall, the 11 in. wall, with space between, gave a safe and a dry wall, and was only a little more expensive. Mr. Harvey seemed to think that hollow walls were objectionable, but he did not say why. Other than the mouse difficulty, which was a trifling one, what objections were there? The hollow wall was a dry wall, and it was surely better to have a wall which was dry under all conditions. As to the parlour question, they must provide one in an ordinary cottage, although it was a useless room. Quite recently, in some cottages he was building, he had been required by his client, after consultation with his gardeners and coachmen, to provide a double-fronted villa—a 350*l.* cottage! The gardener or the coachman required to have the kitchen on one side of the front door and the parlour on the other, with stairs going up from the lobby or hall; the stairs must not open out of the kitchen or bedrooms out of rooms. It was requirements of this kind that hampered one in building so cheaply as one otherwise might, but the difficulties had to be met, for gardeners and others of this class would not take houses that did not possess these luxuries. Architects were sometimes blamed for exceeding cost, and in this class of work it was generally due to these unreasonable requirements.

The vote of thanks having been heartily agreed to,

Mr. Harvey, in reply, said, as to the people who lived in the large living-rooms on the estate, they did not have much difficulty in getting people to live in them. They were really a better class of artisan, and they were pleased to take these houses, and were generally very satisfied with them. As to whether there was a spout to the curved roof of the houses shown, there was a lead spout which carried the water to the main roof. The party walls were carried up to the roof-line; the by-laws did not require them to be carried beyond. The rents quoted included rates. To capitalise the land, it would be about 60*l.* per house, or 1d. per yard leasehold, or 2*l.* 10s. per year. All houses did not pay 4 per cent.; some did not pay more than 2¾ to 3 per cent., but the plainer ones paid 4 per cent. It was the intention of the trustees that all property erected now must pay 4 per cent., which would mean building much more simply and in a cheaper way, which was a difficult matter. Still, as he had shown, some of the houses gave a return of 4 per cent., and to pay 4 per cent. they expected 8 per cent. gross. A park was just about to be opened for the use of the people on the estate, and they were providing a school. He had the plans out now, and he expected that when the whole thing was complete it would amount to about 25,000*l.* It would be fitted up with cookery centre, school laundry, manual instruction, library for use of upper standards, and large playgrounds. It was intended to teach botany and gardening at the school, and the buildings would stand in a garden. The dormers referred to by Mr. Adams were covered with lead. The roads were drained for sewers, and a separate connexion was made for each pair of houses. Of course he had been very fortunate in having a client like Mr. Cadbury, and there were few men ready, as Mr. Cadbury was, to give one a free hand.

The Chairman announced that the next meeting would be held on the 19th inst., when Mr. W. Henry White will read a paper on "Corner Houses," illustrated by lantern views.

The meeting then terminated.

MAGAZINES AND REVIEWS.

The *Art Journal* devotes a very large space to comments on and illustrations of the International Society's Exhibition, illustrating from its walls things beautiful and things ugly and vulgar with impartiality, and bestowing praise all round. It is amusing to read articles of this kind, and to know how this exhibition and many of the things in it are really regarded by many artists of high position. Anything like independent and thoughtful criticism of works of art seems to be almost at an end for the present; the so-called critics run in one path like a flock of sheep; what is in the International is good, what is in the Academy and other exhibitions of long standing, and which keep some principles of art before their eyes, is poor, dull, *passé*. M. Le Sidaner is taken up in another article as a great artist; he is becoming a fashion, and we are told that every work of his is caught up now by dealers and collectors. And what has M. Le Sidaner really done? He has found a new trick in painting outdoor scenes, that of representing everything as if seen through a fog. It is novel; it is clever and striking in a way, but it is in reality merely an eccentricity in technique; and a new eccentricity seems to be the salvation of an artist nowadays. The late Herr Bœcklin, to whose works an article is devoted, was a really fine landscape artist; "The Villa by the Sea" and "The City of the Dead," of which illustrations are given, are really fine and poetic pictures.

The *Magazine of Art* is considerably occupied with architecture. There is Mr. Raffles Davison's article—a continuation—on "The Progress in Recent Architecture," illustrated in this number by sketches of modern town houses, interiors and exteriors. All the illustrations justify the title of the article, and are examples of picturesque and original treatment. This is the last article on the subject, and at the end of it Mr. Davison strongly urges on the reader's attention the fact that, "whatever its cost is to be, the home may always be artistic if the client *really desires* it." He is quite right, and that spirit of desiring art is what we really want. As Lord Leighton said long ago—"What the public wants, that it will have." As a rule the English public does not want art, and that is the great difficulty. Mr. Aymer Vallance continues his series on "Good Furnishing and Decoration of the House," dealing in this number with the bedroom. Speaking of historical changes which have come about, he contrasts the present privacy of the bedroom with the fact that in the days when the dwelling house practically consisted of but one principal room, "the bed or beds of the master and family formed as much a recognised part of the furniture of the hall as did the dining table itself." The writer seems to be speaking of early mediæval dwellings; but he might have gone back to classic times, when the *lectus genialis* was prominently placed so as to give assurance to every visitor of the probable continuation of the family. As to the illustrations, there is too much of the spirit of imitation in them. Why suggest "a Louis XV. bedroom" and "a Sheraton bedroom"? And why, above all, suggest the revival, as part of the show, of that stuffy, unhealthy erection, the four-post bed with a roof over it? The Georgian bedroom is better, for the style of furniture and decoration suggested in it is simple and sensible, apart from any question of historical imitation. We regret to see these imitation styles in an artistic journal, because they tend to encourage the idea (far too prevalent as it is) that there is something essentially artistic in imitating the detail of a former age; and, in the case of the Louis XV. room, an age of tawdry taste. There is a suspicion of the commercial element here, too, the names of the firms who are ready to provide these historical bedrooms being given. Of the modern ones that by C. H. Walker is very pleasing, that by Messrs. Liberty still more so; both of these are quiet and reposeful. The "Bedroom for a Country House," by Messrs. Warings, is also admirable, all but the antiquated four-poster. The reintroduction of this quadruped is a distinct step backward in sanitary furnishing. Mr. Spielmann, in his essay on "Art Forgeries," treats in this number of "Scarabs, Tanagra Figures, Engraved Gems, and Miniatures," giving cruelly an illustration of "a counterfeit scarab in the Birmingham City Museum," and some examples of admirable imitation Tanagra figures. These are honest imitations, offered as such; they show, however, that the thing can be done so as to be deceptive. Mr. Val Prinsep contributes a most interesting and amusing chapter of reminiscences of Rossetti, Burne-Jones, and William Morris, including anecdotes about the execution of those fearful and wonderful paintings executed at the Oxford Union, and how Morris was called to order by Rossetti, and told he must "do that head over again," as it was "not human—you must get some nature." The rest of the story is still better, but it would be unfair to extract it.

The *Burlington Magazine* opens with an article on "The Future of the International Society," which does not promise very much for the soundness or independence of the critical views on modern art which are in future to form part of the programme of the magazine. It is the fashion at the present moment to praise and exalt whatever is *outré* in art, and to proclaim this so-called International Society (whose internationality is very limited) as a kind of wholesome antidote to the Academy. We have read all this over and over again in the current art-criticism of the day, and regret not to find an independent voice. The present exhibition of the International Society, at all events, is not of such a nature as to justify all these anticipations of its future; but as long as the taste for what is eccentric and ugly in art prevails, exhibitions which are content to welcome the ugly and eccentric will be the favourites with the critics. Perhaps it will someday dawn upon them that an Academy which, if it is rather dull and old-fashioned in its sympathies, refuses to find room for unfinished sketches, headless figures, and perverse eccentricities falsely dubbed with the credit of "originality," is after all doing something to uphold a sane standard in art. And when we read that the International Society "does not possess the old associations which assure the Royal Academy and the Water-colour Society, however imperfect their exhibitions, a goodly number of shillings at the turnstile," we can only say that such a sneer at the Water-colour Society, the exhibition in London where there is a higher average of really beautiful works than in any other, is at once ignorant and impertinent. But this kind of writing is in the fashion now, and of those who write one may say, like Prince Henry to Poins, "thou art a blessed fellow to think as every man thinks." It is rather amusing also to read, in the succeeding article, entitled "Criticism and Commerce," the statement that the only reason for the publication of any work will be its inherent excellence—"it will be taken on its own merits without regard to any other consideration, such, for instance, as the presence or otherwise of its owner's name in the advertisement pages of the magazine." Does the editor, who writes this and the preceding article, really suppose that he has the monopoly of this virtuous attitude? Most editors of a high-class magazine, whether in art or literature, would take that as too much a matter of course to make any boast of it. In the articles on and illustrations of ancient work in the same number the magazine fully keeps up the reputation it has acquired. Mr. Claude

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Phillips contributes an interesting article on a beautiful Renaissance bronze relief of dancing figures now in the Wallace Collection, and which is a version of a late Greek or Græco-Roman relief in the Louvre; the two are illustrated side by side. We quite agree, however, in Mr. Phillips's conclusion, that the Hertford House relief is so superior to that in the Louvre, that the latter is not likely to have been the original from which the Renaissance sculptor copied. Other articles are, one on a collection of English glass in the South Kensington Museum, by Mr. C. H. Wylde; one on "English Secular Embroidery of the XVIth and XVIIth Centuries," by Mrs. Head; on "Early Staffordshire Salt-Glazed Wares in the British Museum," by Mr. R. L. Hobson; and on the early Milanese painters, Butinone and Zenale, by Mr. Herbert Cook. The frontispiece is a reproduction from a beautiful Romney portrait in the collection of Sir E. Antrobus, said to be here engraved for the first time.

The *Berliner Architekturwelt* has a very interesting feature this month: reproductions of six designs by Schinkel for scenes in grand opera. Four of them are for "Die Zauberflöte" an opera which is so suggestive for scenes in which a mystic and symbolic architecture plays a prominent part. One would like to see a grand revival of "Die Zauberflöte" with Schinkel's scenery. Some very good modern buildings are illustrated. A private house in Thomasius-strasse, Berlin, by Herr Jatzow, is an admirable design, far more severe and restrained in style than is usual with modern German street architecture. The "Spindlerhofs" building in the Wallstrasse (Messrs. Kayser and Von Groszheim) is a business building of sumptuous solidity and decoration, founded on Byzantine Romanesque, and looking rather as if it had come out of the portfolio of H. H. Richardson. It is somewhat over-ornamented, but a notable building nevertheless. Some illustrations of sculpture are very gratifying, inasmuch as they show much more refinement and less of the blustering spirit than we find in so much modern German sculpture. A drinking-fountain by Herr Hubatsch—a nude nymph kneeling in a niche and holding a pitcher—and a clock by Herr Wilhelm Otto, with a symbolic figure on each side, apparently representing the Future and the Past, or Hope and Regret—are works of real poetic feeling.

The *Art-Workers' Quarterly* is a most useful number, as it contains so many examples of decorative design in textiles, glass, wood-carving, &c., which may serve as models or suggestions for young designers. As a frontispiece there is an elaborate colour reproduction of one of the Hardwicke hunting scene tapestries, with a technical description of the work; and "Practical Notes on Figure Embroidery," by Mrs. Hole, and "Gesso Work," by Mr. K. M. Eadie, are most instructive on the technique of each subject.

Public Works is full of interest. It commences with an article, "Norwich a Port," by Mr. Arthur E. Collins, the City Engineer of Norwich, and also engineer to the River Yare Commissioners, and describes and illustrates, in great detail, a scheme for so treating the river Yare, as to put Norwich as she was in old times, in direct connection with the sea; not counting on bringing the largest class of vessels up to the city, but providing a continuous 15 ft. channel, which would allow the passage of a useful class of moderate-sized trading vessels up to the city. "Sea-coast Erosion and Remedial works" are considered in an article by Mr. R. G. Allanson-Winn; "Municipal Marseilles" is the subject of an article, largely illustrated, by Mr. W. Kelsey; "The Massachusetts Institute of Technology" is described and illustrated in an article by Mr. A. T. Robinson; Mr. W. H. Humphreys has collected a great deal of interesting history on the curious subject of "Wooden Water-pipes." "The Baltimore Sewerage Problem," "The Cleansing of Glasgow," and "A Californian Sewage Farm," are the subjects of three other articles. In an article on "Mosaic and its Modern Uses," which contains nothing new as to the artistic capabilities of the material, Mr. Mackenzie Macbride draws attention to some practical advantages possessed by mosaic, for floors and steps. Among the illustrations to an article on "Municipal Trieste," we note with interest an attempt to treat a gas-holder in an architectural manner; or, rather, we should say that this is the brick-built case of screen of a gas-holder; otherwise the architecture illustrated is not of much interest. "Designing a City," by Mr. Burton T. Ashley, Civil and Consulting Engineer to the Chicago Corporation, is a fascinating title. The author had the task of completely laying out and designing *ab initio* the new Zion City, Illinois, about forty-two miles from Chicago, founded and commenced in 1899. But unhappily the block plan of the city does not impress one with the capability of its designer for making the most of the opportunity. It is laid out like a gridiron, with the square Shiloh Park in a central position, and a wide central boulevard running up to it as a backbone. The best point in the plan is the four avenues, which radiate at an angle of 45 deg., one from each corner of the park, straight across the gridiron of rectangular streets; but, on the whole, it is a prosaic plan, and much more might have been made of it.

In *The World's Work* an article with the rather startling title, "Crossing the Channel by Railway," does not contemplate any reversal of the mad scheme (once much talked of) of a cross-channel bridge, but only the employment of much larger and wider boats, which will take a train bodily on board. It is done already, it appears, across the wider area of Lake Michigan (sixty-five miles) in America. The Channel, however, is a peculiarly rough passage in stormy weather, and we should prefer to cross on a boat without a train on it. No reference is made in the article to the slight difference in guage between English and French railways; it is trifling, and perhaps not sufficient to make a difficulty in running the same carriages on both; but it should have been mentioned.

The *Antiquary* contains an article rather out of its usual line, on "Helleinstic Art," by Miss Constance E. Haldenstein—an American lady we presume, from her use of that fearful phrase, "right back of all three," in a comparison between Greek sculpture and German and French literature. The subject of the article is the idea that there is an analogy between the development of Greek Art and the developments of literature in different countries and ages; and she makes some points in the comparison; but this is rather fanciful than antiquarian. However, the article suggests thoughts. "Letters from France and the Low Countries, 1814-1819," are very interesting. "Grâce Dieu and its Associations" is an article by Mr. H. Butler Johnson on the remains, near Charnwood, of what was once a great Leicestershire priory. The article is very complete and well written, and should tempt anyone travelling in that neighbourhood to contrive a visit to the spot—anyone, that is, of the minority who care for such ancient memories and relics. Mr. Clephan concludes his article on "Two Suits of Armour in the Museum at Berne."

The *Quarterly Review* contains an article by Mr. Lawrence Binyon (the *Quarterly* seems fairly launched on the "signed article" system) on "The Art of the Nineteenth Century," a very large title, implying, however, only a review of a book by that rather captious art-critic, Mr. D. S. MacColl. It is a sensible review, among other things for finding fault with Mr. MacColl's "preciosity" of literary expression, and his view of painting as to be judged only by the execution and not by the subject. "Who is the greatest painter—Louis David in the temple, or Chardin in the kitchen?" asks Mr. MacColl. To which Mr. Binyon gives an apt reply:—

> "No one thinks that David was a successful painter of heroic subjects, while every one is agreed that Chardin's interiors and still-life pictures are unsurpassed. We raise no objections against so obvious a truth; but we protest against the way in which it is put. The whole passage seems to imply a denial that any one subject-matter is of more worth than another. But suppose we compare Chardin, the perfect painter of still-life, not with those who failed in great themes, but with those who succeeded—with Rembrandt, say, or Velasquez. Either of those masters could doubtless, as painters, have surpassed Chardin on his own ground; but, in the main, what gives Velasquez and Rembrandt their greater glory is the superior value and interest to humanity of the contents of their art, the immeasurably wider and deeper illumination which they give to life."

That is just the point. There is a school of critics now who seem to think that subject is of no consequence in a picture, only execution: a heresy almost as deadly (we will not say quite) as its opposite. "After all," as Mr. Binyon says farther on, "we cannot separate art from life": it is unquestionably the worse for both if we do. In another passage quoted Mr. MacColl, to do him justice, seems to recognise this, and recognises it in opposition, moreover, to his idol Whistler. Was the "Portrait of my mother" only an arrangement in black and grey? Then why not have taken a coal-scuttle, in which such an "arrangement" might have been obtained, "uncontaminated by any but the faintest human feeling." In the main, Mr. Binyon's article is a sound and sensible one. It is followed by an important and weighty article on "Matter and Electricity," by Mr. W. C. D. Whetham, to which we may return.

The *Nineteenth Century* contains an article by the Secretary of the Royal Academy on "The Royal Academy Schools"; practically a history of their foundation and development. The most notable point recited in it is the recent decision of the Academy, arrived at after much discussion, to abolish all preliminary or primary teaching in the schools, on the ground that in the present day there are ample opportunities in art schools all over the kingdom for acquiring preliminary knowledge of drawing and painting, and that the Academy should devote its resources to higher branches of instruction and raise its standard for admission, so as not to waste its energies on pupils who would never get beyond mediocrity. The present conditions of admission are given; we have not space to quote them here, but we consider that the Academy are absolutely and entirely right in their decision. Mr. Eaton remarks at the close of the article that it does not pretend to be more than a dry recital of facts; "but at anyrate they are facts, which is more than can be said of some of the statements that have recently been made about the Royal Academy." To the same number the Rev. E. Ledger (Gresham Professor of Astronomy) contributes a valuable article on "The Nebulæ"; a summary of the present state of astronomical knowledge in regard to these, the most puzzling and most elusive to the observer of all heavenly bodies.

The *Monthly Review* contains an article by Mr. Paul Waterhouse on "Audiences and Exits," suggested no doubt by the recent terrible affair at Chicago. What he says is not for the most part new to our readers, but it is a very useful article to publish in a magazine for general readers, and may do good. One suggestion which Mr. Waterhouse makes we may call attention to in regard to exits from the upper gallery, which, for reasons of line of vision, is necessarily the steepest in section. Taking the usual arrangement of two steep stair gangways leading up to the two exit doors, he suggests the danger that those ascending the gangways from the lower seats may be liable to come into collision with those who approach them sideways from the upper seats, and a block would thus be created which would lead to a panic crush. Mr. Waterhouse suggests that a door at each side, instead of the two at the back, leading to a side lobby with the stairs descending at the same angle as the slope of the gallery, would give less opportunity for a block, and would avoid the anomaly of the audience having to mount to the top of the gallery in order to descend again. This last point we fully admit, and it is worth considering; as to a block, it is to be feared that if once people lose their heads and take fright there will be a block wherever you place the door. Mr. Waterhouse refers to the recent case of a fire in a school where the children were got out in safety in a few minutes by the admirable tactics of the mistress in playing a march for them on the piano and getting them to march out in regular order to it; and he suggests that audiences in theatres might very well be drilled sometimes in this method of leaving a building. We are glad to see that people are coming to recognise the sense of this. Nearly twenty years ago we were, we believe, the first to make the suggestion that if audiences, when there was a fire, would only have the sense and coolness to march out two-and-two, as soldiers would be marched out of a building, they could all be in the street in two or three minutes without danger or difficulty; and the only recognition we got was the receipt of an abusive anonymous postcard denouncing the author of the paragraph as a "fool!"

In the same magazine Mr. Basil de Sélincourt returns to the subject of the frescoes of the Life of Christ in the lower church of St. Francis at Assisi. Having already expressed a conviction that they are not, as commonly believed, Giotto's, he proceeds in this article to suggest an author for them—Giovanni Gaddi, the son of Taddeo Gaddi, hitherto little more than a name. The reasoning by which this conclusion is arrived at is interesting, especially in

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view of the quotation from a description of the Assisi paintings in the "Collis Paradisi Amænitas" written by Father Angeli of the Franciscan Order in the XVIIth century, and in which it is distinctly stated that "Jo. Gaddus Taddei" (the work is, of course, in Latin) painted the history of Christ "in cupa sinistri brachii" of the chapel—"in the left transept." The writer suggests that the author of the tract, being a priest and accustomed to look down the building from the choir, would naturally regard that transept as the "left hand" one, which to an ordinary spectator entering the church would be the right hand side. The whole argument, in the light of this quotation, seems worth serious attention.

In the *Century* Miss Edith Wharton continues the fascinating subject of Italian villas in an article dealing this time more especially with "Roman Villas," the most fascinating of all, seeing that with the beauty of their architecture and gardens is combined the association of a whole roll of historic names. Two fine chromolithograph views of the Villa Medici and the Villa Chigi, and an even better black and white one of the Villa Pia, add to the interest of the article. Among other attractions of the number are a coloured reproduction of a charming portrait by Nattier, an engraving by Mr. Timothy Cole of Velasquez's portrait of Philip IV., and an article on "Bric-à-brac Auctions in New York," a subject certainly not without interest from more than one point of view.

In *Scribner* we are again on the subject of architecturally treated gardens, this time "Some Gardens in Spain," by Helena Rutherford Ely. The Renaissance character derived from Italy has penetrated into some of these, though others have a character distinctly Spanish, or, rather, Moorish; less regular than the Italian garden, and richer and more Oriental in character—for orientalism does not go entirely by longitude. The view of the court and gardens in the Palace of the Generalife, Granada, looks at first sight as if it was a view in the Alhambra. The most impressive thing in the illustrations is the sombre cypress alley leading to these gardens. Under "The Field of Art" is an article on the new portal of St. Bartholomew's Church, in Madison-avenue, New York. A screen wall with three great doorways has been built in front of the church as a memorial to the younger Cornelius Vanderbilt, with doors of bronze, a sculptured tympanum over each doorway, and an alto-relief frieze connecting the doorways at the springing. From the illustrations, small in scale it is true, it seems a fine piece of work, founded on Romanesque models. In regard to the relation between the modern and the ancient, we may quote the concluding paragraph of the article by Mr. Russell Sturgis, which is of some interest as a piece of criticism:—

"One may think that in the New York church the carved friezes in the white stone above the doors are too minute and jewel-like for such a composition in what may still be called the Romanesque style. Even the tympanums, though on a larger scale of design, are so delicate that one is inclined to wonder at their position out of doors. On the other hand, the larger frieze, that of the outer wall, with the culminating groups at the centre doorway, is of singular boldness and intensity, being one of which the separate figures are so small. It will be noted that these figures are often semi-nude, and that the general conditions of these figures, their pose, their grouping, their movement separately and taken together, is unusually descriptive. Much in the way of action is expressed by the gestures of these little figures. In all this, the Romanesque tradition is hardly departed from, and if that tradition and the Romanesque style of architectural design is mentioned at all in this connection, it is because one cannot but compare the sculpture of this portal with that of the fronts of Saint Gilles and of Saint Trophime, and that the immediate impression given is one of extreme modernity set into the framework of an ancient design. The reason for this is not far to seek. Modern art is alive as to sculpture of the human subject, but it is not strictly alive as to architecture. There is a XXth century sculpture of American nationality now, whatever its very recent origin may have been, but there is no American architecture, nor any XXth century style anywhere, nor any XIXth century style. For all these matters of purely decorative art—that is to say, of non-representative and non-expressional art—one still goes to the past, and takes its creations with but little change."

In the *Pall Mall Magazine* Mr. E. Rimbault Dibdin gives, under the title "Pictures and the Public," a critical summary, with a good many illustrations, of the present contents of the Walker Art Gallery at Liverpool, which contains two or three remarkable pictures, a good many good ones, and some very poor ones, that ought never to have been bought for a permanent gallery. Some of the anecdotes as to the way the public are affected by the pictures are significant, but hardly encouraging. An illustrated article on Devonshire House serves to show what sumptuous interiors are hidden behind that prim brick front.

In the *Gentleman's Magazine* "Open England," by Mr. John Hyde, is an attempt to convey a sense of what would have been the impression created by English scenery before the days when everything was enclosed, when the traveller must have seen before him everywhere stretches of wild, open country. It is a well-written article on a subject of picturesque interest.

The *Revue Générale* contains a long article on "Les Régies Municipales en Angleterre" (Municipal Government), by M. Joseph Le Nève, dealing mainly with the question of the extent to which municipal enterprise should be carried in such things as the supply of gas and water, etc. M. Le Nève sums up against municipal undertakings of this kind. He goes too far in his condemnation, but it is a thoughtful article, and worth attention by those interested in municipal work. The three special dangers which the author sees in the extension of municipal undertakings, shortly put, are (1) The increase in the number of official employees; (2) these employees, being electors, become indirectly their own employers, and are likely to use their influence to strengthen still further the power of the Municipality; (3) "développement anormal du functionarisme qui tente les âmes lâches et faibles," *i.e.*, leading to a seeking for permanently salaried posts instead of devoting their energies to making a career of their own; thus weakening the spirit and character of individuals. The following remarks are in line with some of our own recent observations:—

"Même dans les cas où la régie est une source de profits pour une ville, ce résultat heureux est contrebalancé par les charges terribles de l'emprunt auquel le pouvoir communal a dû recourir pour former son capital industriel. La dette locale anglaise est énorme et doit donner à réfléchir aux municipalistes les plus convaincus. L'extension de la régie a porté la dette locale de 93,000,000*l.* en 1875 à 276,000,000*l.* en 1899. M. Vermaut constate que du train où elles v vont, les communes anglaises courent droit vers la faillite."

The *Estate Magazine*, a monthly publication which we were not acquainted with, but of which a copy of the February number has been sent to us, contains an article of some practical interest by Colonel Raikes, on "Labourers' Cottages," chiefly in reference to cottages which are being erected on the Marquis of Hertford's Ragley estate, of which we gather that Colonel Raikes is the manager, and accompanied by plans, sections, and elevations of a couple of cottages of the kind that are being built on the estate. The architect is Mr. F. C. B. Dabbs. These cottages, though very simple, should have a good effect, and are well planned. From the following description it will be seen that they contain one or two new ideas for this class of house:—

"These cottages are built of good red bricks and roofed with Broseley tiles, the upper story being covered with rough-cast by way of ornamentation. The living-room is floored with block wood paving laid in pitch on concrete, so should be impervious to damp and almost everlasting in wear. The other ground-floor premises are floored with blue paving bricks on concrete, and the space between the back door of house, the door of wash-house, and the soft water tank, also paved. Instead of a second sitting-room the spare space downstairs has been utilised as an open verandah, which is, so far as I know, a novelty, but I think a good one. It will be enclosed with a rustic gate and fence not shown in plan, and can be used for many purposes, among others as a dry run for the children in wet weather, as a place where the man can sit and smoke or read on summer evenings, where his wife can bring her work, where washing may be hung to dry, where meals can be taken or visitors interviewed and for many other purposes. The living-room is of comfortable dimensions, 13 ft. 6 in. by 12 ft. and 8 ft. high; it is absolutely protected from draught, with lobbies to both outer doors. It is convenient of access to a good airy larder or pantry, and also to a roomy cupboard arranged under the stairs. It might also, of course, open directly into the wash-house, but I prefer the slight inconvenience of stepping out to it through the back door to having the reek of the copper when brewing or washing permeating the house."

It is admitted, however, that no ordinary farm labourer could afford to pay a rent for these that would be remunerative. "The loss must be divided between the landlord and his farm tenant." Profit of another kind, however, may arise indirectly from such a beneficent effort.

In *Everyday Electricity*, a new publication, an instructive article by R. J. Nicholson describes the uses of electricity in farming. He suggests that in those cases where the work on a single farm is insufficient to justify the laying down of electrical plant, two or three farmers should club together and share the expense. Other articles describe the electrification of the Liverpool and Southport Railway and "Electric Power in Textile Factories."

FURNITURE AT THE ROYAL SCHOOL OF ART NEEDLEWORK, SOUTH KENSINGTON.

MR. ERNEST W. GIMSON has a small exhibition of furniture at the Royal School of Art Needlework, which will be open till March 26. Some of the exhibits have been seen before at the Arts and Crafts Society Exhibition last year, but the greater part are new works. Mr. Gimson is an architect as well as a craftsman. The wholesome influence of a workman's knowledge is evident in the photographs, hung round the room, of cottages and stables built from his designs. Such building as this cottage architecture does not involve the perplexities of modern architectural practice, but it helps to resuscitate and keep alive local traditions of building, the use of local material in preference to importing undesirable novelties, and the interest of the workman in his work. These were once qualities inseparable from the homelier kinds of building. The furniture of a house bears such an intimate relation to the room it adorns that no furniture can look well in an ill-planned or over-lighted room. An architect in planning a room should bear the furniture in mind, but it is a mistake to suppose that he can design it himself without being in intimate touch with workshop methods of construction Furniture passably successful may result, but nothing to compete with or replace the fine periods of English furniture. On the other hand, one accustomed to think chiefly of the domestic side of building is at a loss when confronted with the complex conditions under which larger architecture is produced nowadays. Public and commercial buildings do not, as a rule, show the same art that is evident in modern domestic architecture of the best type, but to abandon the one for the other—the easier and pleasanter calling—will not lift architecture on to a high plane. If the movement that there is towards better things is to advance, the best men must face the difficulties and show the way. If art is ever to be the daily pleasure and delight of both workman and artist and public that it once was, it will root in architecture and spread through all the lesser arts.

This by the way; Mr. Gimson has the ingenious mind and the all-round knowledge and training which can make of furniture once more a delight. His work is mostly based upon the carpenter's furniture of the XIIIth and XIVth centuries, rather than of the XVIIth and XVIIIth. The simple necessities—much fewer in number than is usually held to be the case—are what is shown at the present exhibition; tables and chairs, cupboards and boxes; rather substantial perhaps for modern ideas of elegance, but of true design based upon proper construction, and sufficiently ornamented. More refined work is to be seen in the beautiful inlaid pieces—a sideboard, writing tables, etc., of mahogany overlaid with burred elm. There is a very ingenious linen cupboard of English walnut, the doors when open forming runners for the trays within to slide out upon. The chairs shown are superior to the crude, expensive, and often vulgar article exhibited at some of the Arts and Crafts exhibitions. With regard to the use of unstained English oak for furniture, it is quite unsuitable for use in towns, where it soon gets discoloured; but it is delightful as furniture in a modern country house, especially for rooms which are much lived in and not merely ornamental. We have no sympathy for the affectation which is so evident in much of the new furniture shown at the Arts and Crafts; but there are to be found amongst it, and mostly hidden by it, pieces of design and workmanship that would be ornaments to any room and rank with any period of English furniture, and in these there is a hope for a future furniture that is neither a direct copy of the old nor a passing novelty. Any endeavour to make a man's house a place of culture, of restfulness that is, of beauty to the extent that every part of it shows a reasonableness and intelligent perception of the fitness of things is to be welcomed, for how drear and comfortless is the average house that the average man makes the centre of all that he cares about; and, it may be added, how unaware he is of the ugliness around.

APPOINTMENT.—Mr. T. A. Hayward, Borough Surveyor of Stamford, tendered his resignation to the Town Council on the 9th inst., having accepted the post of Borough Surveyor and Engineer of Battersea. The resignation was accepted, to take effect on March 31, and steps were ordered to be taken to appoint a successor.

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THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

II.—TOWN HOUSES IN THE WEST-END.

SATURDAY, February 6, was the occasion of the second spring visit, when a large body of members availed themselves of the opportunity for seeing the interiors of three town houses which have recently undergone structural and decorative repair. In each instance the work is the design of Mr. J. L. Williams, who kindly met the party and drew attention to the numerous points of interest arising from the various operations.

No. 11, Hill-street, Mayfair, which was the first house visited, has received no very extensive alteration, but has been subjected to an almost entirely new scheme of decoration; the ball-room and the main staircase alone remain in their previous state. At the rear of the premises two new buildings were seen—the stables and the motor-house. Some structural precautions were taken, in the nature of new iron stanchions and girders, to strengthen the upper parts of the house, while the old second and third timber-framed floors were removed to give place to modern fire-resisting construction.

Broadly speaking, the character of Mr. Williams's work is based directly upon that of the best period of English Renaissance, and it is not too much to say that both in detail and general effect the results are extremely successful. On the ground floor the inner hall has been extended by the inclusion of a small back room, and the ceiling is charmingly treated with intersecting barrel-vaulting executed in plaster; this, with the enriched cornice and Cippolino marble columns, provides a pleasing vista from the entrance. To the right of the front door is the morning-room, where an excellent scheme of panelling in English oak, with a deep plaster enriched frieze, has been introduced. The doors and chimney-piece form part of the treatment, the latter also being intended to receive a portrait by Mr. Shannon. The carving throughout is well executed by Messrs. Martyn; the swags and drops, designed in the manner of Grinling Gibbons, are beautifully and delicately wrought. In the adjoining dining-room colour plays an important part in the new work. Paintings of allegorical subjects taken from the previous decoration are here introduced, and evidently form the basis of much of the panelled treatment of the walls and ceiling, to which other coloured enrichments are applied. But the principal feature is the raised annexe, whence the daylight of the room is derived. This now occupies the position of an old conservatory, but a structural alteration in the removal of this part of the back wall of the house has provided additional floor space. The treatment is in every way satisfactory; Cippolino columns, a raised marble floor and lead glazing to the mullioned windows add to the success of a well-contrived alteration.

It should be stated that practically the whole of the windows in the house are new, the greater part of them consisting of oak-transomed frames with metal casements and leaded lights.

On the first floor, facing the street, the drawing-room is incomplete, although the heavy modelled plaster ceiling was to be seen; but the most interesting room in the house is perhaps the adjoining boudoir, which has been transformed into a room possessing peculiar charm and interest; and although English influence is absent, the character of the design may be said to find Italian precedent. The walls are covered with panelling, comprising a low dado, above which rises an order of pilasters and entablature forming large panels, which will eventually be filled with tapestries. The panelling is finished principally in Italian pollard walnut veneer, with gilt mouldings and other enrichments; but considerable care has been exercised in allowing the figure of the material to supply the dominant note in the design. The space between the panelling and the ceiling, some 3 ft. in depth, is treated as a plaster cove, and the length is broken up by a series of groins which produces an effect of vaulting. To this cove an interesting scheme of small scale coloured design, recalling Pompeian decoration, has been applied. This was executed, under the direction of Signor Palagi, by Florentine workmen, who have specialised in this kind of work. The result is very happy, although perhaps too elaborate, and when lighted by electric lamps concealed in the cornice of the panelling the effect was by general consent considered to be most successful. The ceiling is similarly treated, and includes paintings from the work previously existing. The coloured marble chimney-piece was also admired.

A new staircase, with domed top light, leads to the second floor, where the principal bedrooms are planned in two suites. To the front are bedroom and dressing-room, panelled in Tabasco mahogany, and intended to receive "Empire" furniture, some of which was in position. Facing the back of the site is a large bedroom, panelled with veneered Italian walnut, but without the Italian influence which characterised the design of the boudoir below; above the panelling is a good modelled plaster frieze, the work of Mr. J. S. C. Carr. In the bath-room of this suite an ambitious marble scheme has been resorted to; the marble bath is sunk below the floor-line, and has a raised moulded curb and step producing a depth of about 2 ft. 3 in., all of which is executed in Cippolino and Norwegian pink marbles; the floor also is laid to a simple design in these materials. Further, there is on this floor a small boudoir over the ball-room, having satin-wood panelling and glass-fronted china cupboards, designed in excellent taste; this is the work of Messrs. Gill and Reigate.

The stables are entirely rebuilt; the elevation to Hay's-mews is of two stories, built with Portland stone and thin red bricks, the roofs covered with tiles. The first floor windows are circular, whilst an arcade-like effect is given to the ground floor; and all windows have lead glazing. The motor-house shows a decided departure from the usual design of such buildings, which arises from the particular materials employed. English oak posts and beams carry a plastered first floor story, which is finished with oak cornices and a large segmental pediment, covered with lead; oak doors and windows are used, and a tiled roof covers the building. The effect is quite satisfactory, and it was understood that special permission for the construction was obtained from the County Council.

The next house visited was No. 9, Hyde Park-terrace. Small alterations have taken place, but general redecoration, somewhat on the lines already described, is in course of execution. Mr. Williams is very happy in his ceiling treatment of high, narrow corridors. Here, in the entrance lobby, as indeed in all other similar positions, the unpleasant height is brought into good proportion by the introduction of a simple kind of intersecting barrel vault, done in plaster, in which hand labour is made to show. Another good point seen in the hall of this house is the breaking up of the long, straight flight of steps ascending from the hall, by turning the lower half-dozen steps at right angles to the flight, inserting a small landing and two Cippolino marble columns at the foot. The dining-room is panelled in oak, having various carvings, notably some delicate undercut drops and swags. The drawing-room has received a structural alteration in the removal of the wall which separated the front and back rooms, so that one large room from back to front is obtained, while the front room, originally extending the full width of the house, is now intersected by an arcade. In the dining and drawing rooms the design of the ceilings is heavy; that in the latter is particularly so, and excited adverse comment; whilst the whole of the other works elicited unanimous praise. The sunk marble bath and other features attracted much attention.

By kind permission of the owner, a party of members, limited to twenty, then drove to the third house, 10, De Vere-gardens, where work of a kindred nature has recently been carried out by Mr. Williams. Here there is a similar staircase alteration, with African red marble columns, whilst the hall is vaulted in plaster. The principal rooms are panelled, and there are some modelled plaster ceilings by Mr. Lawrence Turner.

This concluded a thoroughly profitable and enjoyable series of visits, of which the opportunity was greatly appreciated by the members. In response to a hearty vote of thanks, given enthusiastically upon Mr. Ambler's proposal, Mr. Williams said it was a great pleasure to show his work to the young men present, and expressed the hope that any who cared to see the completed works might do so on a future occasion.

THE SURVEYOR'S INSTITUTION:

GARDEN CITIES.

AN ordinary general meeting of the Surveyors' Institution was held on Monday evening, at No. 12, Great George-street, Westminster, Mr. A. Buck, President, in the chair.

The minutes having been read and confirmed, the Chairman announced that the Council unanimously recommended that Sir A. de Bock Porter be elected a member of the Institution. The recommendation having been agreed to by the meeting,

The Secretary, Mr. Julian C. Rogers, announced the result of recent examinations.

The Hon. Secretary, Mr. Currey, then read a list of some donations to the library and the Library Fund, and on the motion of the Chairman a vote of thanks was accorded to the donors.

The discussion was then resumed on the paper by Mr. Ralph Neville, K.C., on "Garden Cities as a method of Industrial Distribution." *

Mr. H. T. Eve said it was very interesting from a surveyor's point of view to find that 4,000 acres within forty miles of London could be bought at, practically speaking, market prices. The Garden City Co. had to buy first from one owner, and then from another, and the method adopted was to go quietly to the owners to find out if they would sell, and then, by paying a deposit of only 5 per cent., securing the option of purchase, terminable within five years. The 4,000 acres were bought from about seventeen people, and the timber was included in the price of the land, a little of which land was copyhold. The idea was to create a town in the middle of those 4,000 acres, and he believed that that town would be some day created and would be a success. It was easy to criticise, but the directors would be glad of a little more help and a little less criticism. As to the local authorities, the Rural District Council welcomed the scheme, and they were making some common-sense by-laws for the Garden City. As to manufacturers, there must be a few in the Garden City, but he did not think there need be many, and from the promises already obtained, it was clear that the small number required would come in. A good part of the estate was eminently suited for residence, and was only forty minutes' railway journey from town. He hoped the Company would not limit the town to 30,000 inhabitants, for there was room for a much larger population on the site, and there would be plenty of fresh air without the agricultural belt referred to. There would be one street 150 ft. wide, and the other streets would be similar to what would be found in any other well-regulated town. He was afraid that the directors might be carried away by their love of fresh air and make the cottage plots too deep, and if they did that they would lose their profit per acre on the estate, which was simply a big building estate. If the cottage plots were laid out 150 ft. in depth that would be more than liberal, and he hoped the depth would be less. As to the terms of letting the land, that was a difficult matter. The Company could not part with the freehold, and should they, therefore, let on 99 or 999 years' leases? And what scheme should be put forward so that the ground rents could be reviewed from time to time? For that they should be reviewed was essential to the success of the scheme. The scheme was being promoted by hard-headed business men, and it seemed to him that it was bound to be a success.

Mr. H. T. Scoble said that Mr. Neville had told them that it was not intended to carry out the scheme detailed in Mr. Howard's book on Garden Cities, but he found that one of the objects of the Company was "to promote and further the distribution of the industrial population upon the land on the lines suggested in Mr. Howard's book on Garden Cities, and to form a garden city for agricultural, commerical, and residential purposes, or any of them, in accordance with Mr. Howard's scheme, or a modification of it." It seemed to him that he was justified in his suggestion that the scheme would be carried out, as far as possible, on the lines suggested in the book. Where the Garden City showed its chief weakness was in regard to manufacturers, who were hardly mentioned in the scheme brought forward. He had been accused of criticising a pioneer movement to relieve the congested state of large towns; he advocated such movements, but on the lines pursued by Mr. Cadbury and Mr. Lever. The directors of the Garden City Co.

* See our issue for January 30, p. 105.

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said that they did not mean to let any one idea stand in the way of the development of the site. If they were prepared to grant manufacturers freehold sites, then one of his objections to the scheme would be removed, for a manufacturer, in moving into the country, desired to purchase the freehold of his site. He foresaw a large capital expenditure on water supply, sewerage, roadmaking, etc., on the estate. It was suggested that many of these modern conveniences could be provided economically on the site; that was so if the Company had an enormous capital and were authorised by Parliament to pay interest out of their capital fund for a series of years; and if that were possible they might get people to invest; but who was going to tie up his money in a speculative affair for ten or fifteen years and then only get 5 per cent.? The authors of the scheme were very sanguine that the necessary money would be forthcoming, but so far only 80,000*l.* had been subscribed. It was rather naive of Mr. Howard to remark that if the 300,000*l.*, which was thought to be necessary to carry out the scheme, was not sufficient, then more could be provided. They were told that the Company did not intend to build factories, but that they would "set forces in motion" to supply the necessary capital for that purpose. That was all very problematical, and also that they could supply labour for girl members of families. On three grounds he found it impossible to imagine a successful result. In the first place—the difficulties of an entirely new scheme had been underestimated and the advantages had been exaggerated; an enormous capital expenditure would be required, and many of the features of the scheme could not be realised for a long time. Secondly, the predominant partner, the manufacturer, was hardly brought into the scheme at all. Manufacturers were unanimously in favour of managing their own affairs, and they were apprehensive of anything even remotely socialistic in character, and they wanted the advantage of a freehold to start with. And, thirdly, a complete settlement must be established, and he could not see how a desire on the part of one manufacturer to start a manufactory on the site for sixty men was anything like sufficient to start a city of 30,000 people.

Mr. W. Woodward said that when once the city was started, sewerage, lighting, water-supply, and such things, would be matters of minor importance, and so with the railway service of trains. Something like the Garden City was required, and he hoped to see it realised. It was an ideal scheme, but there was very much that was practical in it. The loss of stamina referred to was not due to living in towns. The Londoner, as a rule, was a healthy young fellow. As to workmen's dwellings, he had said before that they could be easily provided at small cost if we could get the British workman to work. The British workman, by his idleness, raised the price of labour so much that rents had to be charged which were sometimes prohibitive to those who occupied the dwellings. The migration of factories was going on very rapidly. A well-known firm, Messrs. Saxby and Farmer, engineers, etc., had transplanted their works from Kilburn to Leicester, and nearly the whole of their workpeople had gone too. As to the increase of lunacy in London, that synchronised with the introduction of the Works Department of the London County Council. If tennis-courts, etc., were provided at these buildings there would be a continued increase of lunacy. He agreed that workmen should not be widely separated from their work, and also that workmen's dwellings could not be built unless the land could be got at something like 3½d. to 4d. per foot super.

Mr. Madgen said there was difficulty in finding attractive factory sites within twenty miles of London, and many points had to be considered—soil, cheap transit, etc. If cheap transit were facilitated by the local authorities of small country districts many difficulties would disappear. If outlying towns were coupled up by means of trams or light railways, and were provided with cheap power supply, they would then offer strong inducements to manufacturers to settle there, especially as many of these towns were well provided with such conveniences as baths, parks, water-supply, sewerage system, post, etc. The Garden City Co. should use their limited funds for pioneer purposes, and should not enter on such a big scheme as the Hitchin scheme; they should try and influence public opinion of the various country districts. The working-man was all right; it was the small tradesman and others who got on local authorities and misrepresented both the working-men and the upper classes.

Mr. E. W. Hudson said the scheme was a beautiful ideal very much in the clouds, but the result would depend on a financial basis; he had seen some of the best estates go wrong for want of sufficient capital. He thought that this ideal scheme was one which ought to be carried into being by Imperial power, for he did not think it was possible to carry it to perfection without a large increase of capital. To provide at first for very wide streets would be a needless expense. If the roadways were made, say, 50 ft., that would suffice, with space, planted with trees, on either side to be drawn upon in the future if necessary. In regard to fresh air, they knew very well that when it was provided in a poor man's dwelling the first thing the tenant did was to stop it out. As to the deterioration of the race, the statistical returns of the recruiting officer were not reliable, for the rate of pay for soldiers was so low that a large number of wastrels applied for admission, and these were the men who were rejected. The pay was not sufficient to attract the best men.

Mr. H. D. Pearsall said that Mr. Scoble told them that the difficulties had been underestimated. Of course they had, but that was the case with all great enterprises. It was an entire misconception to say that the manufacturer had hardly been considered, and that he did not stand to make any profit. They had to consider the kind of manufacturer they thought of in planning their scheme. He was inclined to grant that the large manufacturers like Mr. Lever or Mr. Cadbury did not stand to gain much by going to a city like the Garden City, for they had not much need for the co-operation of other manufacturers; but that was not the case with the large majority of manufacturers of the country. The majority of the manufacturers of the country employed a small number of workpeople, and had a limited amount of capital, and to all such people it was a great advantage to have the co-operation of other manufacturers. The fact that there was such a tendency for manufacturers to move out of the big cities showed the need.

Mr. E. Howard said he had not put forward a complete scheme in his book, as he stated in the work, for that would come later. Would not architects, surveyors and engineers all agree that, granted a suitable estate was found, it was easier effectively to lay out a new city than was the case at the present time and by our present methods? Mr. Scoble was entirely wrong in saying that the manufacturer was the last person thought of—he was the first to be considered, and a large number of manufacturers were distinctly interested in the movement, and out of that number the Garden City would get as many as they wanted at first. As to the amount of money raised, 85,000*l.* was quite satisfactory. They could not go to the public until the scheme was more advanced.

The Chairman said there was certainly need of some scheme to overcome the conditions which this scheme had been promoted to overcome.

It was announced that the next meeting will be held on February 22, where a paper will be read by Mr. J. H. Elwes, F.R.S., on "British Timber and its Uses."

The meeting then terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, S.W., Lord Monkswell, chairman, presiding.

Loans.—The Finance Committee recommended, and it was agreed, to lend Battersea Borough Council 6,739*l.* for paving-works. Sanction was also given as follows: Chelsea Borough Council, 57,000*l.* for the erection of working-class dwellings, and Stoke Newington Borough Council 1,180*l.* for street lighting purposes.

Office Accommodation.—A joint report of the Establishment and Improvements Committee recommended that the Council should acquire the leasehold interest in Messrs. Coutts' premises, Nos. 56 to 60, Strand, for a premium of 8,000*l.*, and a net rental of 2,485*l.* per annum.

Mr. Beachcroft hoped this was not the thin end of the wedge for reviving the Adelphi site scheme for a new county hall. Incidentally he mentioned that when the Council came into existence their rental for offices was 4,000*l.* a year whereas now it was about 20,000*l.*

Mr. Robinson said this had nothing to do with any general scheme, but was an economical manner of putting an end to any improvement compensation claim.

The recommendation was agreed to.

Rotherhithe Tunnel.—Eight tenders were received for the construction of Rotherhithe tunnel at prices ranging from 958,307*l.* to 1,929,051*l.*, the chief engineer's estimate being 1,233,349*l.* The Council accepted the tender of Messrs. Price and Reeves, of London, at 1,088,484*l.* The full list will be found on our Tenders page. It was agreed to advertise for a resident engineer, to be employed, at a salary of 600*l.* per annum, to supervise the construction of the tunnel.

Kensington Fire Station.—The Fire Brigade Committee recommended that the tender of Messrs. Kerridge and Shaw to execute for 10,980*l.* the work of erecting the new Kensington fire station be accepted.*

Mr. Goodrich said he had heard that the work was offered to the Works Department at the amount of the architect's estimate and that it was refused, and yet it would be seen that a firm of contractors was willing to do it for less than the estimate.

Mr. E. Smith, Chairman of the Committee, said that was true, but all the other firms who tendered, and some of the best firms, had exceeded the architect's estimate. He hoped that the work would be carried out for the amount of the contract. The experience of the Committee was that there were always a large number of extras, and an extension of time, when contractors carried out fire brigade work.

The recommendation was then agreed to.

Memorial Tablet to William Pitt.—On the recommendation of the Historical Records Committee, it was resolved to affix a memorial tablet to No. 14, York-place, Portman-square, which was at one time the residence of William Pitt the younger.

Main Drainage Extension. — The Main Drainage Committee recommended that expenditure not exceeding 181,400*l.* be sanctioned in respect of the construction of section D of the enlargement of the northern outfall sewer between the Abbey-mills pumping station and Old Ford; that the work be carried out without the intervention of a contractor; and that the drawings, specification, and estimate of 181,400*l.* be referred to the Works Committee for that purpose.

Mr. Goodman, replying to Mr. Spokes, said greatly as he regretted the inconvenience caused by flooding in South London, the Main Drainage Committee felt that they must deal with the question as affecting the whole of London, and not to attempt to deal with any particular district piecemeal.

Mr. Spokes retorted that dilly-dallying had been the policy of the Main Drainage Committee for the last nine years, and he regretted that a committee of the Council should be so inert and lacking in a sense of its responsibilities.

The recommendation was agreed to and the Council shortly after adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Finsbury East.—Buildings on the site of Nos. 152, 152a, 154, 156, 158, and 160, City-road, Finsbury (Messrs. Cluttons for the Ecclesiastical Commissioners).—Consent.

Kensington, South.—An iron and glass shelter at the entrance to No. 66, Holland Park, Kensington (Messrs. Rawlings Brothers, Limited, for Mr. C. Wilkinson).—Consent.

Kensington, South.—The retention of a projecting shop front at No. 48, Beauchamp-place, Brompton-road, Kensington (Mr. J. Armstrong for Mr. T. Cooper).—Consent.

Lewisham.—Stone hoods to the porches to Nos. 26 to 40 (even numbers only) inclusive, Algiers-road, Lewisham (Messrs. Tompkins and Connew).—Consent.

St. George, Hanover-square.—A balcony and

* The full list of tenders will be found on our Tender page.

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porch in front of No. 27, Upper Brook-street, St. George, Hanover-square (Mr. T. H. Smith for Lord Tweedmouth).—Consent.

Bermondsey.—An oriel window and turret to a proposed building on a site on the south side of Long-lane and eastern side of Great Dover-street, Southwark (Mr. H. J. Williams).—Consent.

Wandsworth.—The retention of a porch to a house on the east side of Elborough-street, southward of Replingham-road (Mr. G. Ryan).—Consent.

Wandsworth.—A one-story addition in front of a house adjoining No. 27, Gwendolen-avenue, Putney (Mr. R. J. Lovell for Mr. A. J. Skipper).—Consent.

Westminster.—Buildings upon a site on the western side of Grosvenor-road and southern side of Atterbury-street, Westminster (Messrs. Woodd and Ainslie for the Royal Army Medical College).—Consent.

Westminster.—Retention of temporary show cases in front of No. 121, Victoria-street, Westminster (Messrs. Williams and Son for Mr. W. M. Power).—Refused.

Hammersmith.—Buildings with one-story shops in front on the east side of Blomfield-road, Shepherd's Bush, southward of Blomfield-villas (Mr. E. J. Clayton).—Refused.

Width of Way.

Deptford.—Extension of period within which the erection of a school building upon the site of Nos. 8, 10, 12, and 14, Besson-street, Hatcham, to abut upon Besson-mews, was required to be commenced be granted (Mr. A. W. Collier).—Consent.

Finsbury Central.—Buildings on a site abutting upon St. John's-place and St. John's-square, Clerkenwell (Messrs. F. Chambers and Son for Mrs. L. Salmon).—Consent.

Islington West.—A building on the southern side of Brandon-road, Islington (the St. Pancras Iron Work Company, Limited).—Consent.

Kennington.—Retention of St. Saviour's Salamanca club-room and mission house, Randall's-row, Kennington Messrs. Beazley and Burrows for the London and South Western Railway Company).—Consent.

Limehouse.—A one-story building in the playground of Dr. Barnardo's Home on the east side of Bower-street, Stepney (Mr. R. H. Hill).—Consent.

Rotherhithe.—Five warehouses upon a site abutting on the southern approach to the Tower Bridge, northern side of Queen Elizabeth-street, and western side of Horselydown-lane, Rotherhithe (Messrs. Barlow and Roberts).—Consent.

Rotherhithe.—Two warehouses on the east side of Horselydown-lane, Rotherhithe (Messrs. Barlow and Roberts).—Consent.

Width of Way and Lines of Frontage.

Hoxton.—Retention of a lantern light on the forecourt of No. 23, Charles-square, Hoxton (Mr. F. A. Powell for Messrs. G. T. Dearberg and Sons).—Consent.

Kensington South.—Buildings upon a site abutting upon the east side of Silver-street, south side of The Mall, and west side of Lucerne-mews, Kensington (Mr. W. M. Weir for Messrs. H. and T. Harris).—Refused.

Paddington, South.—A one-story addition in front of a motor-house at No. 46, Hyde Park-gardens-mews, Paddington (Mr. W. Flockhart for Mr. C. S. Montefiore).—Refused.

St. Pancras East.—A building on a site next No. 11, Aldenham-mews, Aldenham-street, St. Pancras (Mr. G. H. Luetchford for Mr. R. L. Cripps).—Refused.

Width of Way and Construction.

City.—That the application of Mr. B. Norman for an extension of the period within which the erection of a gangway across Freeman's-court, City, to connect No. 1, Freeman's-court with the rear of No. 99, Cheapside, was required to be commenced and completed, be granted.—Agreed.

Width of Way and Space at Rear.

Brixton.—A cottage on the south side of Milkwell-yard, Coldharbour-lane, Brixton (Mr. C. J. Ford for Messrs. S. C. and P. Harding).—Consent.

Formation of Streets.

Wandsworth.†—That an order be issued to Mr. J. M. Jones, sanctioning the formation or laying out of a new street for carriage traffic to lead out of the east side of Wimbledon Park-road, and in connexion therewith the widening of a portion of Wimbledon Park-road and of Merton-road, Wandsworth (for Mr. J. Mildred).—Consent.

Brixton.—Permission to deviate from the plan sanctioned on October 7, 1902, for the formation of a new street to lead from Landor-road to Hemberton-road, Stockwell, so far as relates to an alteration in curves of such street (Mr. W. Hunt).—Consent.

Hammersmith.†—That an order be issued to Messrs. Richardson and White refusing to sanction the formation or laying out for carriage traffic of new streets leading out of Heath-place, Uxbridge-road, Hammersmith (for Messrs. Griggs Brothers).—Consent.

Deviation from Certified Plans.

Strand.—Deviations from the plans certified by the District Surveyor under section 43 of the Act, so far as relates to the proposed erection of the Black Horse public-house upon the site of Nos. 11 and 12, Bedfordbury, St. Martin's-lane, Strand (Mr. H. W. Budd for Mrs. R. Jones).—Consent.

Whitechapel.—Deviations from the plans certified by the District Surveyor under section 43 of the Act, so far as relates to the proposed rebuilding of No. 6, Leman-street, Whitechapel (Mr. S. Hicks for Messrs. W. Coates and Co.).—Consent.

Strand.—Deviations from the plans certified by the District Surveyor, under section 43 of the Act, so far as relates to the rebuilding of No. 37, Warwick-street, Regent-street (Messrs. H. and E. Lea for Messrs. Carrington and Co.).—Consent.

Space at Rear.

Hampstead.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of three blocks of flats on a site abutting upon the south side of Dennington Park-road and west side of Kingdon-road, Hampstead, with irregular open spaces at the rear (Mr. C. H. B. Quennell for Mr. A. Bretzfelder).—Consent.

Poplar.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the north side of Mellish-street, Poplar (Mr. G. Sharpe).—Consent.

Building for the Supply of Electricity.

Holborn.—Building for the supply of electricity upon the site of Nos. 2, 3, 4, 5, and 6, Fisher-street, and 63, 64, 65, and 66, Eagle-street, Southampton-row, Holborn (Messrs. Bourchier, Burmester, and Galsworthy for the Metropolitan Electric Supply Company, Ltd.).—Consent.

Means of Escape at Top of High Buildings.

Finsbury East.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, on the sixth story of No. 50, Finsbury-square, Finsbury (Messrs. Gilbert and Constanduros for the London and Manchester Industrial Assurance Company, Ltd.).—Consent.

The recommendations marked † are contrary to the expressed views of the local authority.

THE LONDON BUILDING ACT.

ON Monday the Works and General Purposes Committee of Hackney Borough Council reported that they had approved of the following suggested amendments of the London Building Act, 1894, being transmitted to the Building Act Committee of the L.C.C. for consideration:

(1) To require adequate means of escape from any new building of which the level of the upper surface of any floor is of a greater height than 50 ft.
(This will amend Section 63 of the present Act, which provides for a height of 60 ft., calculated in a similar manner.)
(2) Similarly in existing buildings, to require means of escape, to be provided before some future date, to be named.
(3) To require adequate means of escape from fire to be provided in any building or part of a building (not being a dwelling house occupied by not more than one family) in which sleeping accomodation for more than 30 persons is provided, or in which over 30 persons are employed.
(4) To amend Section 74 of the Act of 1894, by making provision with regard to the walls, floors, etc., which separate one building from another, or one set of rooms from other sets of rooms in the same or other buildings, and with regard to means of escape from buildings used partly for trade and partly as dwelling houses.
(5) To make provision with regard to the materials used in, and the construction of, the roof of a shop projecting beyond the main front of a building of which it forms part, and in which building persons are employed or sleep: and to require, unless other means of escape from fire are provided, a passage or passages to be constructed to form a separate and direct means of communication between the street and the main building.
(6) To make provision with regard to the construction of lift-shafts in buildings other than dwelling houses occupied by not more than one family.
(7) To provide for an appeal from the Certificate of the District Surveyor, under Section 13, Sub Section 5, with reference to existing buildings within the prescribed distance.
(8) To secure a definition of the words "in any direction" in Section 13, so as to prevent the re-erection of buildings within the prescribed distance at a greater height than the height of the old buildings.
(9) To amend the provision as to "space at rear of domestic buildings," so as to require an open space to exist at the rear of all such buildings above the level of the adjoining pavement in streets laid out before the commencement of the Act of 1894.
(10) To prevent the erection of buildings at a greater height than the width of the street, in streets laid out before 1862.
(11) To transfer to the Borough Councils the remaining powers under Part 7 of the Act, having reference to "iron buildings" and "temporary iron or other buildings" or "structures," so as to remove the confusion which now exists with reference to the provisions of Section 84. (Licences for wooden structures already transferred to the Borough Council by the London Government Act, 1899.)

Illustrations.

HOUSE NEAR WITLEY.

THIS house was designed to be faced with Godalming rubble stone, dressed with local sand-faced red brick, and roofed with red tiles.

The drawing was exhibited at the last Royal Academy Exhibition.

COMPETITION DESIGN FOR COCKINGTON CHURCH.

THE church actually built at Cockington (Torquay), from the design by Sir C. Nicholson which was selected in competition, has just been opened. We may take the opportunity to do justice to the very charming design, here published, which was submitted by Mr. A. H. Skipworth in the same competition. It was considered by the assessor not to come within possibility of execution for the sum named in the conditions, but of its architectural merit there can be no question.

The plan was that of a passage-aisle church, with one large-span roof, the aisle being got in under the flying buttresses which cross it, and which appear above the roof in one of the views.

A DINING HALL.

THIS is not a "Dining-Hall" but a "dining hall"—*i.e.*, a hall in a dwelling-house, which can also be used as a dining-room.

It has a coved ceiling, with a green band of ornament all round it. The plaster frieze is built out about 4 ft. 6 in. from the wall. The dog grate is of wrought iron, with hearth and cheeks of green Dutch tiles; the seats and chairs are covered with purple morocco leather, the wrought iron electric fitting is relieved with brass and green horn ornaments applied to the chain and wires.

All the woodwork and furniture is fumed oak, with a green and purple inlay and wax polished.

Mr. A. D. Clark is the architect. The drawing was exhibited at the last Royal Academy.

DECORATIVE TREATMENT FOR A BILLIARD-ROOM.

THIS is a design made by Mr. Hargreaves, of Liverpool, for execution by Messrs. Waring and Gillow, and exhibited in Mr. Hargreaves's name at the Royal Academy.

The room, having plenty of length in excess of that required for playing, lends itself to the "Nook" treatment. The materials are oak and plaster with a little ebony in the mantel. The opposite end of the room is to have splayed cupboards in the corners (similar in plan to the Nook) for cues, etc.

COTTAGE HOMES.

ALL these are small houses and cottages built on the Bournville Estate, near Birmingham, from the designs of Mr. W. A. Harvey, the author of the paper on "Cottage Homes," read last week at the Architectural Association, and published in the present issue. They are given partly as affording illustrations to his paper.

That marked A shows four cottages in Sycamore-road. B, two cottages in Linden-road (the plans of these will be found on the same sheet). C, cottages in Maryvale-road. D, two cottages in Maple-road, the elevations and sections of which are in the left-hand corner of the sheet. E, cottages in Sycamore-road.

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ARCHITECTURAL SOCIETIES.

NOTTINGHAM ARCHITECTURAL SOCIETY.—The members of the Nottingham Architectural Society met at the Victoria Station Hotel on Wednesday the 3rd inst. upon the occasion of their annual dinner. Mr. A. W. Brewill (President) occupied the chair. In reply to the toast of "The Mayor and Corporation of the City of Nottingham" the Mayor, alluding to a remark which had fallen from Mr. Bromley (the proposer of the toast) relative to the excellent character of the supervision exercised over the drainage of the city by the Corporation, pointed out that matters had in this respect changed very much for the better, and said that at present 60,000*l.* was having to be spent owing to the fact that the work had been indifferently performed thirty or forty years ago. Mr. F. Acton gave "The Nottingham Architectural Society," and observed that the first of the threefold objects of the society was the achievement of that combination and union which, conducted upon proper lines, made for the strengthening of the best interests of the architectural profession. He was glad to know that a better understanding had been arrived at among the profession, a circumstance which would prove an advantage not only to the architects themselves but to the public. Furthermore, a better understanding had been secured between the members of the profession and the builders and contractors. Speaking of the third object of the society—namely, the improvement of the style of architecture—he said that, while not wishing to be uncomplimentary to his hosts, he did not think he could congratulate them upon having many noble examples of architecture in Nottingham at present, but signs were not wanting to show that the society was doing good and a better class of work was to be observed than in former days. The President replied, saying that he could assure Mr. Acton that the society had accomplished much excellent work, more especially during the last three or four years. He was able to give an instance in which a protest, made by the society against a competition which was not considered fair and equitable, had been supported by the Royal Institute, and said that they had the satisfaction of knowing that not a reputable architect had entered for the competition. Mr. Brewill referred also to the question of registration, which he said was engaging the attention of the Council of the Royal Institute.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—At the meeting of this Institution, held on the 5th inst., at the Westminster Palace Hotel, the Chairman, Mr. S. Cutler, jun., presiding, a paper was read by Mr. Hal Williams on "Producer Gas Power for Factories, Cold Stores, and Freezing Works." The paper was written with the object of briefly describing the three systems of generating producer gas now in use and of drawing attention to the principles which must be observed and the errors which must be guarded against in designing a satisfactory power gas installation. Using the name in its generic sense, the author drew attention to the disadvantages which were inherent to the Dowson system of small pressure producer gas plants, and after describing generally the principles of bituminous plants, went on to deal with the suction producer gas plants, which are being so much used on the Continent for generating gas for small powers.

Some remarks were made regarding the recovery of by-products from bituminous plants, and it was pointed out that, while the only two by-products available were sulphate of ammonia and steam, it did not pay to recover the former from plants of a smaller power than from 3,000 to 4,000 h.p. Steam, however, could be generated as a by-product from any gas engine over 50 h.p., the method being to employ a boiler patented by Mr. Wilson, which was placed on the exhaust pipe of the gas engine, and which acted really as an exhaust silencer. With this boiler as much as 2 lb. of water should be evaporated and steam raised to 100 lb. pressure per brake horse-power hour. Steam raised in this way might be very valuable to certain industries requiring a small proportion of it for their manufacturing processes. Taking the average run of factory steam engines throughout the country, not less than 4 lb. to 5 lb. of coal per b.h.p. hour are required. In the bituminous plant as much as 150,000 cubic feet of power gas, having a calorific value of 130 to 150 b.t.u.'s, can be generated from one ton of slack coal. A gas engine of 40 b.h.p. requires from 70 to 80 cubic feet of power gas per b.h.p. hour; larger engines only require from 60 to 70 cubic feet per b.h.p. hour. This means that whereas a steam engine requires from 4 lb. to 5 lb. of coal per b.h.p hour, a gas engine will only require 1 lb. Further than this, the coal used in the former case must be of a better quality than that used in the latter. The author dealt at some length with the suction gas plant and pointed out its numerous advantages. With this type of plant one b.h.p. hour can be generated from 1 lb. of anthracite coal, with the great advantage that gas is only generated by the engine as it is required, and that consequently there is no waste. Comparative costs of power between electricity taken from the supply companies' mains, between gas taken from the gas companies' mains, and that generated from a producer plant were then cited. After numerous practical hints upon the working of gas engines, the paper concluded with a brief reference to the plants for generating fuel gas from wood, it being stated that as much as one b.h.p. hour can be obtained from the destruction of 4 lb. of wood.

THE SANITARY INSPECTORS' ASSOCIATION.

THE twenty-first annual dinner of the Sanitary Inspectors' Association was held on Saturday evening last week in the Royal Venetian Chamber, Holborn Restaurant, W.C. In the absence of the President, Sir James Crichton-Browne, the chair was occupied by Sir Charles Cameron, C.B., M.D., and there were present, amongst others, Lord Monkswell, Chairman of the London County Council; Professor Attfield, F.R.S., Mr. W. Moore, K.C., M.P., Mr. W. Hayes Fisher, M.P., Mr. W. Whitaker, B.A., F.R.S., Chairman of the Sanitary Institute; Dr. Shirley Murphy, Dr. Groves, and Messrs. E. Lewis Thomas, B.A., E. White Wallis, Guy Elliston, I. Young, T. G. Dee, G. H. Anderson, T. F. Strutt, H. H. Spears, R. Hughes, E. Tidman, Hon. Secretary, and several mayors of Borough Councils and others, including several lady members of the Association.

The toast of "The King" having been honoured, the Mayor of Shoreditch (Mr. Bird) proposed "The Houses of Parliament," coupled with the name of Mr. Hayes Fisher. In the course of his reply, Mr. Fisher said that sanitary inspectors admirably carried out the various Acts of Parliament they had to deal with, and as to tenure of their office, they should at least have an opportunity of appeal against dismissal to the Local Government Board.

The Mayor of Poplar (Mr. Yeo) then proposed "The Army and Navy and Reserve Forces," coupled with the name of Alderman Francis, who replied.

Mr. W. Moore, M.P., K.C., then humorously proposed the toast of "Local Government."

Lord Monkswell, in response, said he agreed with the wise words of Mr. Disraeli to the effect that not only local government but the whole government of the kingdom was bound up in sanitation. He was quite aware that Mr. Herbert Spencer, a great English philosopher—and philosophers were not always wise in all directions—said that nobody ought to have any more sanitation than he liked. He did not agree with that. Although there was a great difference of opinion as to the border line in regard to municipal affairs, he always took it for granted that sanitation was the one thing as to which everyone was agreed as being within the politics of municipal work. He was delighted to see so many people interested in sanitary work, especially so many ladies. The lady inspectors carried out their work most admirably.

The Mayor of Fulham also replied. What was wanted for the proper management of affairs in London was capacity, people with time to discharge their duties in a proper and orderly way, and people of integrity who would act fearlessly in the discharge of their duties. He believed that the administration of London was pure and clean, and that was its greatest glory.

The Chairman then proposed "The Sanitary Inspectors' Association," coupled with the name of Mr. Isaac Young, Chairman of Council. He said he was there to speak of the coming of age of their Association, the growth of which might very well be expected to go on. The membership was nearly 700, and they were expecting other kindred associations to join them, and probably the membership of the Association before the next annual dinner would be 1,000. He thought the success of the Association was largely due to the *esprit de corps* of the members, to their most legitimate anxiety to improve their social condition, to their desire to improve their knowledge of the various departments of sanitary science which their work touched on, and also to their endeavour that no incompetent person shall become a sanitary officer. He remembered the time when in Ireland—and no doubt it was so in England—people who had failed in every other path of life became sanitary officers. That was no longer the case, and in the City of London, at all events, no one could become a sanitary officer unless he could produce a certificate of competency granted by a proper examining body, and he hoped that what was the case in London and other large cities would become general throughout the United Kingdom. It required a man of education, intelligence, and culture to be a competent sanitary officer. The navy was spoken of as the first line of defence, and the army as the second; but certainly it could be said that sanitary officers, in repelling the enemies which caused disease and death, were the first line of defence and that the second line of defence was the medical officers, who cured; but prevention was better than cure, and he had no doubt that an enormous amount of disease was prevented by the vigilance of sanitary officers. The Association was deserving of the support and encouragement of distinguished men, and it had had such support, as its lists of Presidents indicated—beginning with that veteran sanitary reformer and pioneer Sir E. Chadwick, who did more than any other Englishman to awaken attention to the dangers which result from the neglect of the laws of public health and who was succeeded by another distinguished man, *i.e.*, Sir Benjamin Ward Richardson, the author of that delightful work "The City of Hygiea." He was glad that the Association was progressing in members and that they had such an interesting journal, so well edited by Mr. Tidman. As to the lady members, he might say that in Dublin there were seven lady sanitary officers, and in his opinion no one could do better work as sanitary officers than ladies. The Association was very anxious to be represented on the examining and teaching sanitary bodies, and he thought they deserved to be. The prosperity of the Association in recent years had been due very largely to the Chairman of the Council, Mr. Young, assisted by other members of Council who had furthered his efforts to put the Association in a satisfactory position. He hoped that the efforts which were being made to improve the status of sanitary officers would succeed. If the public wanted intelligent and well-educated sanitary officers they must pay them adequately and regard them very much in the way in which the civil servants of the country are regarded, and they must make it possible for those officers to feel certain of the tenure of their office and not liable to be dismissed for capricious reasons. If sanitary officers faithfully discharged their duties for a reasonable period of time, when no longer able to discharge those duties they should, like all other public servants, get a reasonable pension.

Mr. Isaac Young, in reply, said the Association was started in 1883, and two of their oldest members were with them that night, *i.e.*, Mr. R. Farrow, of Leek, and Mr. H. Alexander, of Shoreditch. The Association was incorporated in 1891, and since that time especially it had continued to grow and now they had reached an important epoch in their history. Unfortunately, since 1891 other similar associations had sprung up, but he was glad to say that sanitary inspectors were fast becoming a united body. But they were not satisfied, and they thought that, considering their growth and the importance of the work of their members, they were not sufficiently recognised by the powers that be. They were glad to notice, according to the King's speech, that there was a prospect of immediate public health legislation, and he hoped it would be found possible to provide therein security of office for sanitary inspectors. The Bill introduced into Parliament last year by medical officers was unsuccessful, but it was again to be introduced, and he was glad to learn that sanitary inspectors had been included in the Bill. Medical officers had security of tenure, and he felt that sanitary inspectors, on whose reports medical officers largely acted, were entitled to the same consideration, and he hoped that medical officers would support them in

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their efforts to obtain this. As to the training and qualification of sanitary inspectors, although the Sanitary Institute had a large number of associate members who were sanitary inspectors, yet no representative of sanitary inspectors had a voice in the administration of the Institute or in its examinations. In spite of representations to the Institute as to the injustice of excluding a sanitary inspector from the Board of Examiners, the Institute had taken no steps to appoint a representative of the Association on that Board. The Association did not want to institute examinations of their own, and he hoped it would not be necessary for them to do so. There was a branch of the Association at Belfast, and he hoped it would be possible to start a branch in Dublin. The scheme of amalgamation had been practically completed, and he hoped that at the next annual dinner they would be able to announce their federation with the Scottish inspectors, who were much in advance of English inspectors. Public Health Laws of Scotland protect the medical officer of health and the sanitary inspector to a much greater extent than the public health laws of England.

Mr. E. Lewis Thomas, M.A., then proposed "Kindred Associations," coupled with the names of Mr. H. H. Spears, Chairman of the National Union of Sanitary Inspectors, and Mr. R. Hughes, of the South Wales and Monmouthshire Sanitary Inspectors' Association.

Mr. Spears said, in response, that he hoped that within a few months the whole of the members of the National Union would be followers of the standard raised by the Sanitary Inspectors' Association. Grievances under which inspectors laboured were to the disadvantage of the public health, and he hoped that they would become one united body, as there was now no reason why they should not.

Mr. Hughes having also replied,

Dr. Groves, J.P., proposed "Science and Art," coupled with the names of Professor Attfield, F.R.S., and Mr. Guy Elliston, Secretary of the British Medical Association. He had been told that art included everything we do not recognise as nature and that science was all that we know about nature. Another definition—a definition of a pupil teacher in an examination—was: art is putting two and two together and science was finding out what two and two means, which was not such a bad answer, for he himself had been taught that science was the knowledge of things and art was the putting of that knowledge into practice; in other words, science consists in knowing, art consists in doing. The science of hygiene was the knowledge of the laws of health, and medical officers of health and sanitary inspectors were engaged in the art of putting those laws into practice or seeing that other people obey them. Science taught men how to live and move and have their being in the most advantageous manner physically, and art gave to life—or gave us in our lives, if we chose, for it was very much a matter of choice and education—charm and pleasure and delight.

Professor Attfield, in response, said he had been engaged for between thirty and forty years within a stone's throw of that room in teaching an art and science which was of much interest to members of the Association, *i.e.*, the art and science of chemistry. As to teaching and examining, he hoped that examination would ever be made not the master but the servant of education. Said Huxley, when alluding to a class of candidates at an examination who had only too successfully prepared themselves by the art of cram: "They learn to pass, not to know, and outraged science takes her revenge: they do pass and they do not know." If sanitary inspectors made themselves conversant with the arts and science relating to their duties and studied not so much for gain but for the pleasure they got out of their study, the better they would fit themselves for their calling and the more useful they would be to the community. He specially recommended them to study chemistry, including, of course, facts relating to air and food and water and the terribly neglected art of ventilation.

Other toasts were "The Chairman," proposed by Mr. W. Whitaker; "The Visitors," proposed by Mr. Shirley Murphy and acknowledged by the Mayors of Battersea and Hampstead; and "The Press."

PUBLIC LIBRARY, STIRLING.—Stirling Public Library, for the erection of which Mr. Andrew Carnegie seven years ago gave a sum of 6,000*l.*, and subsequently increased it to 7,000*l.*, has just been opened. Mr. Ramsay Taylor was the architect of the building.

Correspondence.

FIXING DOOR FRAMES.

SIR,—In a building where a large number of door frames are required, it is impossible to keep them clean for staining and varnishing if these are built in as the work proceeds, particularly if the building operations extend over several years. Would any correspondent who has experienced this difficulty kindly give particulars of a simple and inexpensive, but effectual, method of securing door frames when fixed after the walls are up? STABILITY.

COMPETITIONS.

TOWN HALL, SUNDERLAND.—A monthly meeting of the Sunderland County Borough Council was held on Wednesday, when the awards in connexion with the competitive designs for the extension to the Town Hall were announced as follows:—First premium, 100*l.*, Messrs. Wills and Anderson, Adelphi, London; second premium, 50*l.*, Messrs. R. Hemingway and A. W. Bradshaw, Nottingham; third, 25*l.*, Messrs. Goss and Burgess, London.

INVERNESS TOWN HALL EXTENSION.—In accordance with the award of Mr. A. H. Crawford, the Inverness Town Council have accepted the plans of Mr. James R. Rhind, architect, for the additions to the Town Hall.

BOOKS RECEIVED.

MODERN HOUSE DRAINAGE: PLANS AND DIAGRAMS. By Gerard J. G. Jensen, C.E. (Sanitary Publishing Co., 2s. 6d.)

QUANTITY SURVEYING. By J. Leaning. Fifth edition, revised and enlarged. (E. and F. N. Spon, 25s.)

The Student's Column.

ARCHES.—VII.

AS the strength and stability of a masonry arch depend upon the position of the line of resistance, it is desirable that the point of application, the direction, and the intensity of the external forces acting upon each voussoir of the arch should be known. Unfortunately, it is rarely possible to determine these points with any degree of accuracy.

If the external load is represented by a fluid, the pressure upon the voussoirs is normal, or perpendicular, to the extrados, and can readily be determined, for the vertical fluid pressure is proportional at every point to the depth below a given horizontal plane. To the pressures so found, the weight of each voussoir can be added, thus giving the several external forces acting upon the arch. This condition of loading very seldom obtains in actual practice.

In cases where the arch supports a masonry wall, or a series of masonry walls, as very frequently happens, it is exceedingly difficult to determine even with approximate accuracy the influence of the walls upon the stability of the arch. It is very often assumed by designers that the whole weight of the masonry above the soffit rests upon the arch, but this hypothesis is not a correct one, for it is a well-known fact that every masonry wall is, to some extent, self-supporting.

Experiments made by Professor Ira O. Baker * showed that brick beams bonded as regular masonry had a modulus of rupture approximately equal to twice the tensile strength of the mortar, when built with ordinary care, and three times the strength of the mortar when built with great care.

Further, every architect and builder is aware of the fact that large openings can often be cut through masonry walls without the necessity for providing any extraneous support, and also that walls can often be supported over openings on timber beams that would be utterly inadequate to carry the load if the masonry possessed no transverse strength. It is also common knowledge that walls built of dry masonry are, to some extent, self-supporting.

In the case of an arch surmounted by a masonry wall, it would be possible to make an approximate computation of that part of the load remaining to be supported by the arch, but the result would be of very little service, as no indication would be afforded thereby as to the distribution of the pressure. The assumption adopted in practice that the whole weight of the masonry presses upon the arch certainly errs on the side of safety, but it must be admitted that the data so taken as the bases of computation are very inexact, and that subsequent mathematical calculations cannot give any true idea of the precise value or character of the strains involved.

Another hypothesis frequently adopted in arch design, is that the load presses only vertically upon the voussoirs, and in order to make this supposition in accordance with the facts, it is necessary to assume that the extradosal ends of the voussoirs are dressed with horizontal faces (as shown in Fig. 33, p. 113) for the purpose of receiving and transmitting the vertical pressure. Under these conditions, it is assumed that no horizontal forces have to be considered.

If, however, the extradosal ends of the voussoirs have oblique surfaces so that they constitute an extrados with a regular curve (as in Fig. 34, p. 113), they cannot transmit vertical pressure except so far as they may be enabled to do so by cohesion of the voussoirs, and the assumption that vertical pressure only is exerted does not accord with the fundamental principles of stability. It is evident that when the extrados forms a regular curve, there must be active horizontal components of the vertical pressure, and these would exist even if the superimposed masonry were divided by vertical joints extending from the top of the wall to the extrados.

For example, we have in Fig. 41 a semi-arch composed of four voussoirs on which is superimposed a wall with vertical joints. Considering the second voussoir from the top, the weight of the column of masonry, resting on the oblique extradosal face, is prevented from sliding by the resistance afforded along the vertical surface of the adjoining column of masonry. This resistance assists in opposing horizontal force transmitted by the preceding voussoir, and similar action takes place in other parts of the structure. Hence the outward thrust, instead of being resisted entirely by the abutment, is distributed over the whole structure.

Moreover, even if no active horizontal forces were developed, the resistance of the supported masonry—in the form of spandrel walls or spandrel backing—would materially affect the stability of the arch.

One of the most common effects, upon the removal of the centring, is that an arch tends to sink at the crown, and to rise at the haunches (as in Fig. 37, p. 141). Therefore, the passive resistance of the spandrel masonry is of material assistance in preventing this tendency, the efficiency of the resistance depending upon the quality of the masonry and increasing with the deformation of the arch. Nevertheless, it is extremely difficult, if not impossible, to form any reliable estimate of the horizontal resistance afforded by the spandrel masonry.

Another assumption usually made in computations is that the arch ring supports the masonry above it. This assumption is not correct, for the whole of the masonry from the extranos to the top of the supported wall, or walls, acts more or less as an arch. In fact, it is almost invariably the case that some part of the masonry enters into the constitution of the *real* arch, the form of which frequently differs very considerably from that of the *apparent* arch suggested by the ring of voussoirs.

The foregoing considerations point very clearly to the difficulties attending the application of purely mathematical theories of the arch to actual practice.

Again, if an arch has to support a mass of earth, it is impossible to determine with any accuracy the amount and the direction of the earth pressure. The action is similiar to that prevailing in the case of the earth held up by a retaining wall. It is known that earth has a tendency to break away and to slide down an inclined and curved surface, the force tending to produce this effect being the weigh of the earth, and the forces tending t prevent it being friction and cohesion alon the inclined surface. Consequently, the hor zontal pressure exerted against a retaining wa depends directly upon the form of the surfa down which the earth tends to slide. Similarl the vertical pressure of the earth support by an arch depends upon the form of the inclin surface down which the earth tends to slide.

If the constants of weight, friction, a cohesion could be definitely ascertained, t problem would be comparatively simple. a matter of fact, however, there is a remarka

* "The Technograph," University of Illinois, 1892–3. No. 7, pp. 29–37.

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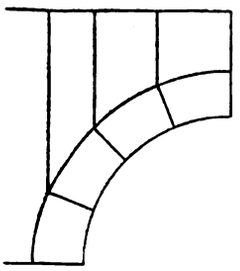

Fig. 41.

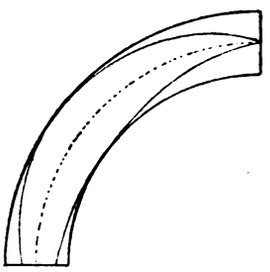

Fig. 42.

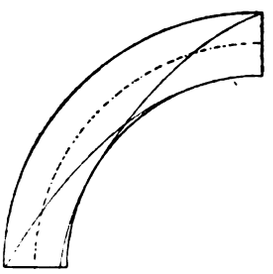

Fig. 43.

lack of data with regard to the actual action and effect of earthwork under circumstances such as those to which we refer. Reliance has been placed very largely upon theoretical investigations, which, unsupported by the results of practical experiments, are of comparatively small value. It is well known, however, that the whole weight of the earth super-imposed upon an arch is not carried by the arch, and in practice this fact is always recognised.

The assumption is generally made in connexion with the theory of the masonry arch that earth pressure is entirely vertical. This hypothesis is not correct, for the pressure of the earth gives rise to horizontal forces. Referring to Fig. 35, it will be seen at a glance that horizontal forces applied to the extrados must have the effect of adding to the stability of an arched structure, such as that shown in the diagram. It is also evident that for a given position and intensity of thrust the line of resistance must approach more closely to the extrados when the external forces are vertical than when such forces are inclined. Bearing these points in mind, we are brought to the conclusion that, although it is incorrect to regard the pressure of the earth as a wholly vertical pressure, the error operates in the direction of safety.

The determination of the external forces acting upon an arch is a matter quite apart from the mathematical theory of the arch, although, as we remarked at the beginning of this article, the position of the line of resistance cannot be defined unless the external forces are fully known. That they cannot be known with any close approach to accuracy has already been demonstrated, but for our present purpose it will be sufficient to assume that they have been actually determined.

Turning again to Fig. 35, we may point out that every variation of the value of the horizontal force or thrust, Q, involves a corresponding variation of the line of resistance. For instance, if the force Q were increased, the point *b*—at which R_1 intersects the joint between the voussoirs C and D—would be shifted along the line of the joint towards the extrados of the arch. Similarly, the points *c*, *d*, and *e* would find new positions along the joints between the other voussoirs, and nearer to the extrados.

If the force Q were increased to a sufficient extent, the line of pressure would pass through the outer extremity of the bottom joint of the voussoir A, or through the outer extremity of the joint between the voussoirs A and B; and the arch would then be on the point of failing by rotation about the outer edge of one of these joints. As a general rule the line of pressure would pass through the outer extremity of the bottom joint of A, but this would depend upon the dimensions of the arch and upon the values and directions of the forces P_1, P_2, and P_3. The value of Q here implied is manifestly the maximum limit for thrust, at the point *a*, consistent with safety against failure by rotation, and the corresponding line of resistance is the line of resistance for the maximum limit of thrust at the point *a*.

Again, if the force Q were progressively decreased, the line of resistance would gradually approach and ultimately intersect the intrados, and the arch would be on the point of failing by rotation about the inner edge of some joint in the intrados. The value of Q here implied clearly represents the minimum limit for thrust, at the point *a*, consistent with safety against failure by rotation, and the corresponding line of resistance is the line of resistance for the minimum limit of thrust at the point *a*.

Fig. 42 indicates lines of resistance for maximum and minimum thrust at the point *a* of the semi-arch there represented.

We will now consider another aspect of the case, and assume that the position of the point of application of the horizontal force Q is progressively lowered, and that the intensity of the force is simultaneously increased. A line of resistance may thus be obtained having one point in common with the intrados, and this is the line of resistance for maximum thrust at the joint of the crown, as indicated by the lowest curve in Fig. 43.

Next we will assume that the position of the point of application of the horizontal force Q is progressively decreased. A line of resistance may thereby be obtained, having one point in common with the extrados, and this is the line of resistance for minimum thrust at the crown joint, as indicated by the highest curve in Fig. 43.

Each fresh direction of the force Q results in a new line of resistance, and every different value of the various factors here involved, and every different combination of the values has the effect of giving a correspondingly different position for the line of resistance. Consequently the number of possible lines of resistance is infinite, and the problem for solution is to decide which line is the proper one for adoption.

The solution is by no means easy of attainment, as there are so many unknown quantities, for determining the values of which no means are available. With the object of overcoming the difficulties presented, various hypotheses have been formulated with the object of rendering possible a solution of the problem.

Among the hypotheses proposed one that is based on the principle of least thrust at the crown has probably met with more general approval than any other. According to this theory the true line of resistance is that for which the corresponding thrust at the crown is of the minimum value consistent with equilibrium. This assumption implies that the thrust at the crown is a passive force called into play by the external forces acting upon the arch, and further, that as its intensity need be no greater than that required for the maintenance of a condition of stability, the thrust must be the least possible consistent with equilibrium.

Although this hypothesis does not by itself delimit the position of the line of resistance, it furnishes means by which the line of resistance corresponding with a minimum thrust can be determined, if the external forces are fully known, and if the direction of the thrust is assumed.

ROYAL COMMISSION ON LONDON LOCOMOTION.

AT the sitting of this Commission, on Thursday last week, Mr. C. S. Meik, M.Inst.C.E., gave evidence. He said that his evidence had been prepared in conjunction with Mr. Walter Beer. The London traffic problem might be divided into two heads—relief of congestion of vehicular traffic, and the transport of passengers between the outskirts and the central business area, and through that area. The improvement of vehicular traffic could only be effected by means of new streets. He considered that the provision of two great arterial thoroughfares, running respectively from north to south and from east to west, was of the first importance. Witness then handed in plans and sections of the proposed thoroughfares, which he termed "main avenues," and described them at some length. New thoroughfares were preferable to widenings. The great thoroughfares ought to run right through London, should be capable of extension, and should be made to tap, as far as possible, the large railway termini, and other congested centres. In the construction of the roads special provision should be made for through traffic, and, in particular, for motor traffic. It was absolutely necessary that the part of such roads for through traffic should not cross important thoroughfares on the level, but nearly all cross streets might be connected with the roads either on a lower or an upper deck. Except by steps for foot passengers, it would be, as a rule, unnecessary and too costly to connect directly the upper deck of the new roads with any but the chief cross roads. Where the principal cross streets were far apart secondary streets might be so connected. With regard to motor traffic, he considered that a road specially for it was necessary, not only on account of the increasing number of privately owned cars, but also because of the strong probability that before long motor omnibuses would displace the horsed vehicles. While it was desirable that motor vehicles driven at a moderate pace should use the main road, it was necessary that an entirely distinct road should be provided for high-speed motor-cars, both on account of facility of movement and the preventing of accidents to foot passengers. The new roads to which he had referred should be of two types—"main avenues" and "first-class roads." The avenues should not be less than 160 ft. wide and the first-class roads 100 ft. The main north and south avenue would commence in the vicinity of Enfield and terminate between Croydon and Wallington. It would cross the Thames between Blackfriars and Waterloo Bridges, and would make a connexion with the east to west avenue between Rosebery-avenue and Pentonville-road. It would afford means of access to all the central parts of London for the large populations which would grow up in the vicinity of the L.C.C. building areas at Tottenham in the north and at Norbury in the south, areas which were expected to accommodate 40,000 and 60,000 people respectively. Traffic would be drawn from all the northern railway termini by means of the main west to east avenue, and from Victoria, London Bridge, and Bricklayer's Arms stations by means of first-class roads. Waterloo Station would also be tapped by means of a new embankment on the south side of the river from Waterloo Bridge to Blackfriars. The main west to east avenue would commence in the vicinity of Osterley Park, near Hounslow, and terminate to the east of Barking. Paddington, Euston, and the other large railway termini would be tapped, and the road would pass close to the East and West India Docks. A new cross road could be made to connect the Tower Bridge with Vauxhall Bridge. Referring to the proposed embankment, he said that it should be made with two decks, the upper for road traffic and the lower for the wharves. The upper deck would also be useful in providing a terminus for the tramways along Blackfriars and Waterloo Bridge roads. Considerable difficulty had been experienced in laying out the lines of the proposed avenues owing to the high-level railways crossing the routes. Where possible, the roads would be taken under the railways. Railway or tramway communication was obviously necessary along any new main roads, and the proposed avenues would permit of the construction on the upper deck of tramways, either upon the conduit or upon the overhead system. The first-class roads would also permit of the construction of tramways, and would, as a rule, be single-decked roads, having no higher gradient than 1 in 30. Turning to the question of railways in connexion with the new roads, he said that the only types of railway which could be constructed were suspended railways, shallow subway railways, or tubes. He described at some length the details of the three types, and said with regard to suspended railways that there would be less danger from fire in their case, since the motors and electrical conductors would be above the bodies of the carriages. On the score of carrying capacity, all three types could be made equal, but, in the case of tubes, an increased width of carriage would entail a proportionately larger cost than the other systems. The platforms of a suspended railway would be from 16 ft. to 18 ft. above the level of the upper deck of the main avenue, which deck would carry the whole of the pedestrian traffic. A shallow subway platform would be at least 37 ft. below the level of the upper deck, and in the case of tubes the platform would be at a minimum depth of 70 ft. With a shallow subway lifts would be desirable for that part of the traffic arising from the new avenue, and with a suspended railway for that part arising from cross streets; but those lifts would be less costly than the lifts necessary for tubes. Witness then proceeded to deal with the cost of construction of the three types of railway. A suspended railway would cost 75,000*l.* per mile; a shallow subway 250,000*l.*, and a tube 350,000*l.* In the case of a new main avenue, the cost for the foundations of a suspended railway would be small, and he had not included them in his estimate. Shallow subways and tubes, said witness, had the advantage of being out of sight, and he did not consider that a suspended railway was ugly, and it would not interfere with light and air. He then put in tables showing the estimated cost of the proposed avenues. The figures with regard to the cost of the Thames embankment had not been arrived at. With regard to the avenues, the acquisition of the necessary land and buildings would, he estimated, take a period of ten years,

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and the resales of surplus land a period of fifteen years. In the case of the north to south avenue, the cost of acquiring the necessary property was estimated at 31,343,000*l.*; recoupment would amount to 36,789,000*l.*; the works would cost 10,020,000*l.*, so that the net cost of property and works would be 4,574,000*l.* The figures in the case of the east to west avenue were:—Property, 39,843,000*l.*; recoupment, 33,801,000*l.*; works, 10,695,000*l.*; making the net cost, 16,737,000*l.* The figures for the north to south avenue included the whole cost and recoupment of the property at the junction of the two avenues, but the cost of the works there was divided between the east to west avenue. Witness then proceeded to deal with the cost of the tramways and railways, and the revenue to be expected, and the fares to be charged.

At the sitting of the Commission on Friday last week evidence was given by Sir R. Littler, K.C., Chairman of the Middlesex County Council, who referred to the heavy expense the Council was put to in maintaining roads which were worn out, not by local traffic, but by the traffic passing from London to counties beyond. He considered that a series of through main roads should be constructed through the county at the national expense, to provide for the necessary through traffic. Witness dealt at length with the merits and disadvantages of proceeding before the Light Railway Commission, and expressed a strong opinion that all schemes should go before Parliament, which was by far the most satisfactory tribunal. Under the Light Railway Commission the Lands Clauses Act came into operation, and if a promoter wanted to widen a road he was bound to take the whole of a house, or building, or manufactory if the owner wished to sell the whole. This he considered a hardship to the promoter. In cross-examination by Sir John Wolfe Barry witness said he was strongly of opinion that any new great thoroughfares should be carried out by the State.

Mr. J. E. Waller, M.Inst.C.E., who has been connected with many tramway enterprises as consulting engineer, considered that the construction of tramways must play a considerable part in solving the problem of London traffic, and thought a comprehensive system of tramways could be constructed in London without adding to the congestion of the streets. He believed that the only satisfactory way to deal with the tramway legislative problem, whether applied to London or the whole of the country, was the creation of a special tramway or street traffic board, probably forming a Government Department. This board might have the power to investigate and sanction all schemes brought before it, but there might be an appeal to Parliament.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the Managers of the Metropolitan Asylums District was held on Saturday last, Sir R. Hensley in the chair.

Leavesden Asylum.—On the recommendation of the Works Committee, the revised plans of proposed cottages for twenty-two married attendants at the Leavesden Asylum were approved and adopted.

South-Eastern Hospital: Electric Lighting.—The same Committee recommended, and it was agreed, to seal an agreement with the London Electric Supply Corporation, Limited, for the supply for five years of electric current to the South-Eastern Hospital and the adjoining ambulance station.

Southern Hospital.—The report of the Committee stated that among the plans relating to buildings at this hospital which were approved by the Local Government Board in September, 1901, were plans for a laundry building, erection of a boiler house, chimney stack, and coal stores, being provided for by the insertion in the contract of a provisional sum of 8,500*l.* The total cost of the group of buildings, including the laundry, was then estimated by the architect at 11,926*l.* The precise nature of the arrangements to be made for lighting and heating the hospital had not, however, been determined at the time. As the result of consultations which had taken place between Messrs. Treadwell and Martin, the architects, and Mr. Hatch, the engineer, the Committee now submitted an amended plan of the laundry buildings and boiler house, together with plans showing a disinfector house, destructor house, coal stores, electrical power house, engineers' and artificers' shops, and an independent chimney shaft, 120 ft. high. The total cost of those buildings was estimated by the architects to be 14,995*l.*, or 3,069*l.* over the amount provided in the contract for the laundry, boiler house, etc., as originally planned. The Committee pointed out, however, that against that extra there was a provision of 5,000*l.* in the contract for contingencies, and a further provision of 2,400*l.* for extra foundations. The revised plans were, on the recommendation of the Committee, approved and adopted.

Having transacted other business, the Board adjourned.

GENERAL BUILDING NEWS.

ST. JOHN'S CHURCH, WIMBORNE.—This building has just been reopened after works of alteration. The work now carried out consists of a new chancel 23 ft. long, which retains the original apsidal form at the end. The floor has been laid with marble mosaic flooring, polished, and has a white Sicilian marble step. An arch has been built in the north wall of the chancel from which access can be gained to the vestry. An oak dado has been carried round the wall of the chancel. In the former chancel there were three small lancet windows which were filled with stained glass, bearing figures of St. John, the Good Shepherd, and St. Luke. These three windows have been altered to form a three-light window in the east. Three small quatrefoil windows have been added above them to correspond. The new chancel is further lighted by windows on the south and north. These windows have been executed by Messrs. Heaton, Butler, and Bayne, of London. Beneath the east window has been erected a carved oak reredos. By the extension of the chancel accommodation will now be found therein for the choir. The choristers' benches, which are of carved oak, have been extended, and new clergy desks have been added. This work, as well as the reredos, has been carried out by Messrs. Whipple and Co., of Exeter and London. They have also framed the Commandments in oak to match the other woodwork, and these have been placed each side of the east window. The organ chamber has been built on the south side of the chancel, and contains arches opening into the chancel and south transept. The floor of the organ chamber is of wood blocks, and the chamber contains a window and a separate entrance. This removal of the organ from the transept and the accommodation provided for the choir in the chancel will be the means of increasing the sittings for parishioners; but to gain still further accommodation the south transept has been lengthened by 6 ft. 6 in. About seventy more sittings will now be available. The new work has been carried out to match the stonework in the other portions of the building, whilst the heating and ventilation of the church have also received attention. The architect for the alterations and additions was Mr. W. J. Fletcher, who was architect of the church; the builder was Mr. C. H. Green.

CHURCH, ACCRINGTON.—A new church, dedicated to St. Mary Magdalen, has been erected at Accrington, from the designs of the architect, Mr. H. Ross, J.P. The new church is bounded on the east by Devonshire-street, on the north by Eccles-street, and on the west by Westwood-street. When completed, it will consist of a chancel, with organ chamber adjoining, nave, transepts, and aisles. A chapel is also provided for week-day services. The site on which it is built slopes considerably, and this has enabled the architect to place vestries under the chancel, and to make a parish room. When finished, the church will provide accommodation for 530 worshippers. The estimated cost was 5,260*l.*, with 1,770*l.* in addition for the tower and spire and 270*l.* for the boundary walls. In the portion now ready the chancel has been erected, and the nave carried a little to the left of the tower. The tower has been roofed at a height a little above the aisles. Accommodation is now provided for 312 worshippers. The next portion to be built will be the remainder of the nave and aisles, with a west gable, whilst the tower and spire will be taken in hand last of all. The height of the latter from vane to ground will be 158 ft. The church has been built of stone.

CASTLEDAWSON CHURCH, BELFAST.—The first of the opening services in this church after alterations and repairs was held on the 31st ult. Inside, all the old woodwork has been removed, and the church lengthened several feet; a new gallery, facing the pulpit, takes the place of the old one, and an open timber roof replaces the former plaster ceiling. The pews and all the woodwork are of pitch-pine, and varnished. A pulpit has been erected to the memory of the Rev. J. H. Fitzsimons, with a memorial window on either side and a circular window above. The heating apparatus has been installed by Messrs. Musgrave and Co., the high-pressure boiler system being adopted. The contractors for the work were Messrs. M'Dowel, Leathem, and Fraser, Belfast, under the superintendence of the architect, Mr. Thomas Houston, Kingscourt, Belfast.

WESLEYAN CHURCH, SUNDERLAND.—A new church and schools have been erected in Chester-road by the Wesleyans of the Durham-road Circuit, Sunderland. The new church, schools, and lecture rooms, etc., occupy a position at the corner of Ewesley-road and Chester-road. The church will accommodate 600 worshippers. It is cruciform in plan, and is entered by vestibules which face the Chester-road. To the left of the main entrance rises a tower, which contains the staircase leading to a gallery running across the end of the church, over the front of the vestibules. The seats, choir stalls, rostrum, etc., are of selected pitch-pine, and the windows are glazed throughout with cathedral leaded lights. At the rear of the church there are a school, ministers' vestry, and infants' schoolroom, while on the site to the left of the school is a two-story building, containing lecture hall, ladies' parlour, vestries, kitchen, lavatories, and cloak room. The buildings are faced with the best Ruabon bricks (Edwards), and the front of the church has Denwick stone dressings and tracery windows. The whole of the premises are lighted by electricity from the Corporation mains. The architect for the work was Mr. J. Jameson Green, Liverpool; contractor, Mr. J. W. White, Sunderland; and clerk of works, Mr. W. A. Lowry, Liverpool.

CHURCH AT HENDY, CARMARTHENSHIRE.—The Bishop of St. David's recently dedicated the new Church of St. David, at Hendy. The new building, which is in the Early Decorated style, has been erected on a site given by Sir W. R. Clayton. The estimated cost of the structure is 2,000*l.*, and there are 300 sittings. The architect was Mr. W. Griffiths, Llanelly.

WESLEYAN CHAPEL, LANDORE.—The Wesleyans of Swansea Circuit decided to build a new chapel upon the site of the old structure erected in 1860 at Landore. The designs of Mr. W. Beddoe Rees, architect, Cardiff, were accepted, and building operations have just been commenced. The builders are Messrs. J. and D. Jones, Swansea.

BAPTIST CHAPEL, CAMBRIDGE.—The Baptists of Cambridge have just erected a new chapel, at a cost of 9,000*l.* The building is on the site of the old chapel, and is of whole flint facings set in cement, with white stone dressings, the windows, which are of the perpendicular Gothic style, being fitted with coloured glass. There is a tower, surmounted by a spirelet, at one corner of the street frontage. There is a gallery running along three sides of the edifice, and accommodation is provided for over 1,000 persons. The contractors were Messrs. Kerridge and Shaw, of Cambridge; and Messrs. G. and R. P. Baines, of London, were the architects.

NEW SCHOOLS, OXFORD.—The foundation-stone of the new schools of St. Thomas, Oxford, was laid on the 26th ult. The buildings are of red brick, stone, rough cast, and tiles, and comprise two halls, class-rooms, teachers' rooms, and cloak-rooms, accommodating 400 children. The builder is Mr. J. Wooldridge, of Oxford, and the architect Mr. Philip A. Robson, of Westminster.

HIGHER GRADE SCHOOL, CANTON, CARDIFF.—A new higher grade school is to be erected at Canton. Competitive plans were invited from the architects practising in Cardiff, and over thirty firms competed, and the School Board have decided to accept the plans of Messrs. James and Morgan. The new school will be built on a portion of the site at present occupied by the Canton Cattle Market, and the school entrances will be in Market-road. The plans show that the class-rooms, as far as possible, have been grouped around the central hall. The walls are to be built with local stock bricks, faced externally with suitable red pressed bricks. The structure is expected to cost about 20,000*l.*

SCHOOL, LOWESTOFT.—The new Council School, which has been erected at a cost of between 9,000*l.* and 10,000*l.*, on Roman Hill, Lowestoft, has just been opened. The new school has accommodation for 820 children, 260 each of boys and girls, and 300 infants. The builders were Messrs. Hawes and Son, of Norwich; and Mr. Rushworth, of Croydon, was the architect. The contract price was 9,200*l.* The schools are lighted by electricity.

SCHOOL, PONTYPRIDD.—Mr. James Roberts, J.P., Chairman of the Pontypridd Education Committee, formally opened the new infant school at the Trallwn recently. The building has been erected, at a cost of 3,848*l.*, by Mr. E. B. Smith-Jones, Barry, from plans drawn by Mr. A. O. Evans, Architect to the Education Committee, Pontypridd. The school provides accommodation for 400 infants. It is built on the central hall principle, and has eight class-rooms. The central hall is lighted by sky-lights running the whole length of the roof, and all the class-rooms open directly out of it; it has wood-block floors. The structure is of native stone, with Cattybrook brick dressing.

SYNAGOGUE, WOLVERHAMPTON.—The Hebrew community in Wolverhampton have just erected a new building, the material used being pressed bricks, with stone dressings. It is estimated that the cost of the building will be about 1,000*l.* The architect is Mr. Beck, Mr. Gough was the builder, and the decorating

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and painting was undertaken by Mr. G. Greenstone.

CREMATORIUM, LEEDS.—A crematorium is to be built, at an estimated cost of 2,500*l.*, in the grounds of Lawnswood Cemetery at Adel, Leeds. The plans of the new structure, which have been prepared by Mr. W. S. Braithwaite, architect, Leeds, show that the crematorium is to be built on the south side of the present Nonconformist chapel. It will be 34 ft. long and 20 ft. in width, inside measurement. The building will be of stone, with a tiled roof, and the chimney is to be encased in a tower. The furnace will be on a French principle, and the heating will be gas instead of coke. Mr. Eugene A. Fradet, of Paris, is the inventor, whose system is in use at Rouen, Rheims, and other Continental centres.

NEW OFFICES, NORWICH.—The directors of the Norwich and London Accident Insurance Association have purchased a large block of property adjoining their head office in Norwich, and have instructed Messrs. Geo. J. and F. W. Skipper, architects, to prepare plans for an extensive scheme of enlargement.

ST. SILAS' SCHOOL, BLACKBURN.—The new schoolroom which has been added to St. Silas' School, Clematis-street, Blackburn, was opened recently. The new story, which is built over the old schools, measures 93 ft. by 33 ft., and, in addition to being used as a school, it will be utilised for assembly purposes, being capable of accommodating 600 people. Glass sliding screens are utilised, thus forming five class-rooms, and here the education of the senior mixed department will be conducted, whilst the junior mixed and infant departments will be carried on on the ground floor. The alterations have necessitated the rearrangement of the ground floor portion. About 3,000*l.* has been spent, which not only covers the cost of the addition, but provides for new cloak-rooms, lavatories, etc., for the three departments. The buildings are heated on the low pressure hot water system, with radiators at the openings for warming the incoming air, whilst the vitiated air is extracted by means of electric fans fixed in the roof. The architects are Messrs. Joseph Smith and Walter Stirrup, and the contract was carried out by Mr. John Boland.

SANITARY AND ENGINEERING NEWS.

PARKES MUSEUM.—It may interest our readers to know that, with the approval of the Council of the Sanitary Institute, Mr. Scott-Moncrieff's sewage testing apparatus can now be seen in the Parkes Museum. The apparatus has been designed for the purpose of obtaining exact information upon which to base bacterial sewage disposal schemes, particularly as to (1) the depth of filter required to produce the necessary standard of purity in the effluent; (2) the quantity of air necessary for the life processes of the organisms in the filter; (3) the correct rate of flow per unit of filter-bed surface in order to obtain the best results; and (4) the best period of rest between each discharge to prevent gelatinous growths in the filtering material.

THE SANITARY INSTITUTE.—The following officers will preside over meetings of the next Congress of the Sanitary Institute, to be held in Glasgow from July 25-30:—*President of the Congress*, the Right Hon. Lord Blythswood. Section I.—*Sanitary Science and Preventive Medicine:* Professor J. Glaister, M.D. Section II. — *Engineering and Architecture:* Professor H. Robinson, M.Inst.C.E. Section III. — *Physics, Chemistry, and Biology:* Professor Clowes, D.Sc. *Conferences.*—Of Municipal Representatives: Councillor W. F. Anderson. On Industrial Hygiene: Councillor J. Steele. Of Medical Officers of Health: Sir Chas. A. Cameron, C.B. Of Engineers and Surveyors to County and other Sanitary Authorities: Mr. Wm. Weaver, M.Inst.C.E. Of Veterinary Inspectors: Professor James McCall, F.R.C.V.S. Of Sanitary Inspectors: Mr. T. F. Strutt. Of Women on Hygiene: The Duchess of Montrose. On Hygiene of School Life: Professor J. Edgar, M.A. The lecture to Congress will be given by Sir Richard Douglas Powell, Bart., on "The Prevention of Consumption."

WATER ADMINISTRATION AND PLUMBERS' WORK. An influential conference of water authorities, architects, and plumbers, met in November last, in order to discuss various matters connected with the administration and distribution of water; and a joint Committee on Water Regulations was appointed to undertake the task of systematising the methods of water administration in the United Kingdom—a task which the enormous growth of urban population in recent years, and the consequent possible inadequacy of the national sources of water supply, has rendered vitally necessary at the present time. Sixteen of the chief water authorities and companies, supplying populations of 100,000 and upwards, the British Association of Waterworks Engineers, the Royal Institute of British Architects, and the Worshipful Company of Plumbers are among the bodies represented on the Committee. Of the problems of water administration, the Committee will only take cognisance of those connected with the distribution of water for domestic and other purposes. The subject thus defined naturally divides itself under the three main heads of (*a*) by-laws and regulations, (*b*) fittings and materials, and (*c*) workmanship, with each of which divisions a sub-committee has been appointed to deal.

FOREIGN.

FRANCE.—M. Carolus Duran has been re-elected President of the Société Nationale des Beaux-Arts (New Salon); MM. Roll, Rodin, Waltner, and Besnard are Vice-Presidents, and M. Dubufe Treasurer.——At the horticultural gardens at Boulogne-sur-Seine, a new free school of drawing and modelling from plants has been established, under the title of "Académie des Arts de la Fleur et de la Plante." It is directed by several painters and sculptors of note, and lectures on art and æsthetic are given to the students.——The Government has decided to accept the gift offered to the State by M. Osiris of the château of Malmaison.——M. Guyon has been appointed architect for the erection of the artisans' dwellings to be built on the site of the old prison of La Roquette.——Important works are to be undertaken at Brest for the sanitation of the town, which will involve the demolition of a portion of the old fortifications.——The Pont de Grenelle is to be widened by three mètres by corbelled out additions in iron on each side of the existing bridge.——M. Camille Bernard, Professor at the manufactory of Sèvres, has opened in the Rue de l'Odéon an atelier of architecture, preparatory to the course of the Ecole des Beaux-Arts.——A committee has been formed to erect a statue to Jeanne Darc at Beauvais.——The jury on the competition for a Hôtel de Ville at Troyes has selected, to take part in the second competition, MM. Balley and Monceau, Legrand, Tronchet, Robert and Hameau, Duval and Robida, and Hocherau and Brun.——The fine building of the College of Jesuits at Bordeaux has been entirely destroyed by fire.——M. Amédée Perrière, architect, of Paris (a former pupil of Viollet-le-Duc), has died at the age of 60. He was architect of the chapel of the Pères Assumptionistes in Rue François I., Paris.——The death is announced also of M. André Bellemain, architect, of Lyons, aged 52. He was given the cross of the Legion of Honour for his courageous conduct during the war of 1870.

GERMANY.—The Heinemann Gallery at Munich has been opened. The building was designed by Herr Emanuel Seidl, in Renaissance style. The exhibition rooms extend through two floors, and are lighted from the north and south, one gallery also having a top light.

AUSTRIA.—The cathedral at Brünn is to be restored according to the plans of Herr Kierstein, of Vienna. The towers are to be added to the cathedral, and the interior is to be considerably altered. The work will probably occupy four years.

SWITZERLAND.—The church at Münsingen has been considerably enlarged. The tower had become unsafe, and was replaced by a new one by the architect, Karl Indermühle. He has succeeded in retaining the simple character of the building, which is in keeping with its beautiful surroundings.——Two hundred and fifty names have already been entered for the International Congress for the Promotion of Draughtsmanship (Kongress zur Förderung des Zeichenunterrichtes), which is to take place in August at Berne.

SINGAPORE.—A large number of houses (about 700) to be used as shops or dwellings are in course of construction in the town and suburbs, and several European houses have been erected in the suburbs. At Sophia Hill "Carrington House," now known as "Adis Lodge," has been almost entirely rebuilt and the grounds laid out, at a cost of over 15,000*l.* Of business premises in course of construction the principal ones are those of Messrs. Kelly and Walsh, at Orchard-road, and Messrs. Whiteaway, Laidlaw, and Co., at the corner of Hill-street and Stamford-road, both on a large scale. The Opium and Spirits Farmers are building for their own use a three-story block of six houses, comprising offices and stores in Cecil-street. Messrs. Fraser and Neave have completed, and are now in occupation of, their aerated water works at Anson-road. These premises are probably the finest in the East, and are most conveniently situated. The Tanjong Pagar Dock Company have erected offices for their staff close to the docks, and have also completed several large warehouses to meet the continuously increasing demand for accommodation at the wharves; other improvements are being actively carried out on the company's property. The lease of the Hôtel de l'Europe has changed hands, and it is intended by the new lessees to pull down nearly the whole of the present buildings and to erect a new hotel.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. Messrs. Pugin and Pugin, architects, have removed their London offices from Brook-green, Hammersmith, to 159, Kensington High-street, W.——Messrs. Hodkin and Jones, manufacturers of artificial stone, marble, etc. (Sheffield), have opened a London office at 63, Finsbury-pavement, E.C.

QUEEN VICTORIA MEMORIAL, BIRKENHEAD.—A memorial to the late Queen is to be erected in Hamilton-square Gardens. The memorial, which will stand upon a base of eight stone steps, will be 70 ft. high. The design is carried out on similar lines to the original Eleanor crosses, with the exception that in the second of the three stages the statues of Queen Eleanor have been omitted. The monument is an octagon, and consists of three parts, the lowest containing traceried panels and shields of arms, and an inscription giving the history of the memorial. Mr. E. Kirby, of Liverpool, is the architect.

SELL'S DIRECTORY OF TELEGRAPHIC ADDRESSES.—We have received the copy of this Directory for 1904, which contains every new telegraphic address, or alteration, registered at the Post Office up to December 31, and it contains the names of the chief 60,000 firms of the United Kingdom who have telegraphic addresses. It also contains a complete list of English consuls in foreign countries, classified under the towns in which they reside. Quarterly supplements are promised for giving additions and alterations, a special staff being maintained to take note of these.

MARKET, ETC., BUILDINGS, GAINSBOROUGH.—The Gainsborough Urban Council recently discussed the proposal to turn the whole block of buildings in the Gainsborough Market Place—which the Council have now acquired—into a covered market and Town Hall area. As to the form the buildings should take, it was at first suggested that lockup shops should be placed in the basement, but it was pointed out that much of the newly acquired space would have to go for street improvement. It was then suggested that a duplicate scheme should be prepared, showing the municipal buildings with and without shops, and Mr. Cooper advised consultation with the architects of the present Town Hall, Messrs. Brameld and Meek, of Manchester. Eventually the Markets and Highways Committees were appointed a joint committee to formulate the work and report to the Council.

MEMORIAL, STOKESAY.—A stained glass window and brass tablet have been placed in the Parish Church, Stokesay, in memory of Lieutenant Tredinnick, who was killed in the South African war. Both the brass tablet and the window were from the designs of Mr. Payne, Master of the Art School, Birmingham.

ELECTRIC LIGHT, TUNSTALL.—A special meeting of Tunstall Urban District Council was held on the 1st inst., Mr. H. Smallman, Chief Bailiff, presiding, to consider the question of an electric installation for the town. A letter was received from the Town Clerk of Burslem, stating that the question of supplying Tunstall with electricity had been before a committee of the Burslem Corporation, who had decided to recommend the Town Council to enter into an agreement with Tunstall on the following terms:—(1) The Tunstall District Council to agree to take not less than 50,000 units per annum for a period of not less than seven years, the price to be as follows: 2d. per unit up to 100,000 units, 1½d. per unit for each unit over 100,000 and up to 200,000 units, 1d. per unit for each unit over 200,000 units. (2) If the Tunstall switchboard is fixed at the central station in Burslem an extra charge for switchboard attendance at Burslem will be 75*l.* per annum. (3) Mr. Bremner will be allowed to act as electrical adviser to the Tunstall Council and to supervise the laying down of electric mains in Tunstall, on terms to be arranged by him, with the approval of the Burslem Committee. (4) The question of Mr. Bremner, or the electrical engineer for the time being, acting as electrical engineer for Tunstall, will be considered by the Burslem Council if the above terms are satisfactory to Tunstall. This offer was discussed at considerable length, and ultimately the following resolution was passed:—"That, provided Burslem is in a position, from a legal point of view, to carry out such an arrangement, this meeting is prepared to recommend the Council to enter into an approved agreement with the Burslem Corporation for supplying Tunstall with electricity in bulk on the terms contained in paragraph one of the letter of the Town Clerk of January 28, 1904, the details of clauses two, three, and

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four to be further considered and discussed with the Corporation of Burslem."

STREET IMPROVEMENTS, LIVERPOOL.—An inquiry was held on the 4th inst. at the Liverpool Municipal Offices, by Mr. R. H. Bicknell, M.Inst.C.E., Inspector of the Local Government Board, in regard to a petition by the Corporation for a provisional order to put into force the power of the Land Clauses Act in regard to certain lands required for street widening and the construction of a new street; and, further, into an application to borrow 43,000*l.* for the purchase of the Calderstones Estate. Mr. Pierce, the Deputy Town Clerk, stated that the petition had reference to the widening of High-street, Wavertree, the widening and extension of Morley-street, the diversion and widening of Morley-lane, Kirkdale, and the construction of a new street between Allerton-road and Beech-lane. The improvements were urgently required in the interest of traffic, and the works in High-street were already in hand. The proposed new street would be across land belonging to the Marquis of Salisbury. It would follow for the most part the present footpath, and would be 800 yds. in length, with a uniform width of 60 ft.—The Inspector asked how it was proposed to accommodate the people who would be dispossessed.—Dr. Hope replied that a recent census showed that there were in the city 1,000 empty houses, the rent of which was 6s. a week or under.—The Inspector wished to know the number of suitable empty houses within a radius of a mile, or a mile and a half, of the proposed improvements.—Mr. Pierce said the information would be sent to the Inspector.—As to the second application, Mr. J. A. Brodie, City Engineer, said that three large estates in the neighbourhood were being developed, and a population of about 25,000 was springing up.

LONDON MASTER BUILDERS' ASSOCIATION HANDBOOK.—This is a diary, combined with a great deal of important practical information bearing on the carrying out of building work. It includes a comparative statement of hours worked per week, and rate of wages per hour, in various branches of the building trade, in a number of towns in England; a key to the London Building Act, referring to the clauses which govern different building operations; Conciliation Board decisions, etc., etc.

NORTH-WEST DURHAM BUILDERS' ASSOCIATION.—The annual dinner of the members of this Association took place at the Railway Inn, Annfield Plain, recently, when about forty gentlemen were present. County Councillor Jos. Eltringham (Blackhill) occupied the chair, and Mr. Wm. Johnson (West Stanley) acted as Vice Chairman. Mr. Jos. Dunn (Kyo) discharged the secretarial duties.—Mr. Penman (Newcastle) proposed "Success to the North-West Durham Builders' Association," and this was replied to by the Chairman.—Mr. George Nicholson (Leadgate) gave "The Architects and Surveyors," and this was acknowledged by Mr. J. T. Trowsdale (Annfield Plain).—Mr. Morfue (Dipton) submitted "The Builders' Travellers," to which Messrs. Hutchinson and Hill responded.—The Vice-Chairman proposed "The Visitors," and Messrs. Hy. Dowse (Blackhill) and J. G. Ridley (Stanley) responded.

ASPHALT MINES IN COLUMBIA.—Asphalt mines have been recently discovered, and are now being worked, in Columbia. Mr. Vice-Consul Dickson, considering there might be British houses desiring to do business in the article, has sent to the Foreign Office a letter giving some details. From this it appears that at the present time the company have one mine, or deposit, working near Chaparral, Tolima, from which they are shipping about 2,000 tons per year; of this, a little more than one-half goes to the United States, the balance to Germany. The asphaltum is of the hard variety, and it is almost impossible to tell the difference between it and Egyptian. The Columbia asphaltum is used entirely for the body of paints, and the making of fine varnish. It is shipped from the mines in sacks, and sells f.o.b. New York for 65 dollars (13*l.*) the short ton. The ocean freights are about 5 dollars 50c. (1*l.* 2s.) per ton.

STATUES IN YORK MINSTER.—Memorial statues of Archbishop John de Thoresby, William of Wickham, Canon of York, William de Skirlaw, Bishop of Durham, and Henry, third Baron Percy, were unveiled recently in York Minster. The new monuments have been placed in the Lady Chapel, and they have been executed by Messrs. Farmer and Brindley from the designs of Mr. G. F. Bodley, R.A.

WAR MEMORIAL, SOUTHWARK.—A mural tablet, which has been erected in memory of Colonel Salmond and former members of the 1st Cadet Battalion of "The Queen's" who were killed in South Africa, was recently unveiled by Lord Methuen in St. Saviour's Church, Southwark. The tablet is of bronze, and has been designed by Mr. E. Hoole.

THE THAMES STEAMBOAT BILL.—In the House of Commons on Tuesday, the London County Council's Thames Steamboat Service Bill passed its second reading. The Bill, which was presented by Mr. John Burns, provides for the expenditure of 280,000*l.* upon establishing a municipal penny per mile passenger service on the river by means of a fleet of thirty steamers.

MUNICIPAL AND COUNTY CLUB.—At the house dinner of the Municipal and County Club, held on the 8th inst. at Whitehall-court, Sir Francis J. S. Hopwood, Permanent Secretary of the Board of Trade, was the guest of the evening. Mr. Laurence Gomme, Clerk of the London County Council, and President of the club, was in the chair, and among the members present were Sir Fortescue Flannery, M.P., Mr. Norval Helme, M.P., the Town Clerks of Camberwell, Guildford, Finchley, etc., etc. The dinner was followed by an entertainment.

LIFTS FOR THE TUBE RAILWAYS.—The electric lifts for the whole of the Yerkes system of tube railways are to be supplied and fixed by the Otis Elevator Company. The contract comprises about 170 lifts, each capable of raising a load of 10,000 lb. (equivalent to about sixty-five passengers), at a speed of 200 ft. per minute, through shafts varying from 40 ft. to 180 ft. in depth. The underground stations will be fitted in most cases with four, and in some cases with six, lifts. The majority of the shafts will be 23 ft. in diameter; some, however, will be 30 ft. diameter; the small size shafts will each contain two lifts, the larger size three lifts each. The lifts will be electrically operated from the Chelsea generating station, from which electric power will be furnished for the three railways comprising the system, viz., the Baker-street and Waterloo, the Charing Cross, Euston, and Hampstead, and the Great Northern, Piccadilly, and Brompton railways. Precautions will be taken to insure the security of the public by the adoption of special safety appliances, and of non-flammable material throughout the mechanism and its accessories.

THE ST. LOUIS EXHIBITION.—There will undoubtedly be a very large gathering of engineers during the present year at the forthcoming Exhibition at St. Louis. The American Society of Mechanical Engineers have selected Chicago as the place for their spring meeting, having in view the advantages to be gained by holding the meeting in a city with ample accommodation for visitors, and within easy reach of the St. Louis Exhibition. Further, they have extended an invitation for the Institution of Mechanical Engineers to participate in the proceedings, with the result that the last-mentioned body have decided to hold their annual summer meeting in conjunction with that of the American Society at Chicago. The American Society of Civil Engineers have invited their British *confrères* to avail themselves of the facilities provided by the Society at the St. Louis Exhibition, and the head-quarters in the Liberal Arts Building will be a rendezvous for engineers from all parts of the world. A visit has also been arranged by the Institution of Electrical Engineers, who will attend the International Electrical Congress of St. Louis to be held in September next. All interested in electricity and its applications will be invited to accept membership in the Congress, and ample accommodation will be provided by the Exhibition authorities. It is to be regretted that St. Louis is so far from our shores, as many who would like to visit the Exhibition and to take a part in the scientific meetings will inevitably be debarred from so doing by lack of time or money.

BUILDING OPERATIONS IN MEXICO.—In a report drawn up for the Foreign Office respecting the trade of Mexico, Mr. C. Biorklund, Clerk to His Majesty's Legation, mentions among the important articles in demand iron piping of all kinds. The value of these imports in 1902 amounted to 239,073*l.* Iron piping is used almost entirely in the sewerage system and water mains now being laid in several of the new quarters in the suburbs of Mexico city. The importation of iron beams for building purposes alone in 1902 amounted to 111,459*l.*, and as in modern construction they are taking the place of wooden beams (which in many cases were of cedar), this seems to be an article for which there will always be a demand. The buildings in the new quarters of the city are very different in construction to the old edifices in the heart of the town, which were erected more than 100 years ago, when labour was cheap, and when it consequently did not make much difference if they took a longer time to build. The material used in the walls, which were in many instances over 4 ft. in thickness, was principally "tezontle," a stone of volcanic formation, and very hard; the beams were of well seasoned wood, cedar being given the preference on account of its durability, and the space between the floors of one story and the beams beneath was filled in with earth, the depth being in nearly all cases over a foot, a process which not only deadened the sound, but, in case of fire, which was very rare, served to extinguish, or, at least to isolate, it. The modern buildings are run up very quickly, "tepetate," a kind of concrete of clay and sandstone, said to be peculiar to Mexico, and bricks, being the principal components of the walls, which are seldom more than 3 ft. thick. A great deal of brick is now brought from Saltillo, Monterey, and Cuernavaca, where large and improved brick factories have been erected, the bricks being of a smoother surface than those made in the immediate vicinity of the city of Mexico. Iron beams and corrugated iron sheets form the divisions between the floors, and many of the new houses have mansard roofs, instead of the old-fashioned flat brick roofs. Mr. Biorklund adds, that considering the amount of buildings that are being erected, not only in and around the city of Mexico, but also in all parts of the Republic, it is surprising what a lack there is of good finishings, such as bolts and locks, window fastenings, etc. What is obtainable is either of American or German make, and usually of a very inferior quality, with the result that they do not last any time. The hardware business, not only in Mexico city, but also in all the large towns in the different states of the Republic, is in the hands of German firms, connected more or less directly with the four principal firms in Mexico. There are now only five hardware stores of any importance in the city, four of them being the firms just mentioned, and the other a Spanish house. There was, also, until quite recently, a large Mexican firm dealing in hardware, with a fair assortment of goods, many of them of British manufacture, but the whole of the business and stock was bought up by one of the existing German firms.

CAPITAL AND LABOUR.

NEWCASTLE-ON-TYNE.—A meeting of the Conciliation Board, formed seven years ago, to settle the dispute between the bricklayers and plasterers on Tyneside as to the demarcation of their respective work was held on Tuesday last week at the offices of Messrs. Oliver, Leeson, and Wood, Newcastle, to consider a question raised by the plasterers as to an alleged infringement of the schedule agreed upon between the two trades in relation to some recent work done in the neighbourhood. Mr. J. W. Dyson, Chairman of the Board, presided. Mr. R. J. Leeson represented the architects, Mr. Walter Lowrey and Mr. Weir the master builders, Mr. McLeod and Mr. Carron the plasterers, and Mr. Hope and Mr Drummond the bricklayers. After considerable discussion and admission on both sides that there was no intention to create trouble an amicable settlement was arranged, thus avoiding a disturbance in the building trade.

TEES-SIDE DISTRICT.—The master builders in the Tees-side district, comprising the Hartlepools, Stockton, Thornaby, and Middlesbrough, have given three months' notice to reduce the bricklayers', joiners', and plasterers' wages one penny per hour, the labourers a halfpenny per hour, and the plasterers' labourers one farthing per hour.

Legal.

BUILDING OWNER AND ARCHITECT.

IN the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, on the 10th inst., Mr. Hawtin applied on behalf of the defendant in the case of Taylor *v.* Burrows for leave to appeal from a decision of a Divisional Court of King's Bench. The learned counsel said that the appeal to the Divisional Court from the award of the arbitrator, or special referee, raised a question as to what constituted misconduct on the part of the referee. The action was brought by the plaintiff against the defendant for the balance of an amount alleged to be due under a contract to build some flats. The defendant employed an architect, and, acting upon the advice of the architect, defendant refused to pay the amount claimed in the action—85*l.*—and, furthermore, he was advised by the architect that he was entitled to claim damages from the plaintiff to the extent of some 500*l.*, for breach of contract, in so far as the plaintiff had not carried out his contract so far as it related to measurements, with the result that thirty-two rooms in the flats were 2 ft. less in dimensions than they ought to have been. On that ground the defendant refused to pay the amount, and that action was started. Afterwards both parties agreed to have the architect as referee in the matter. The first complaint the defendant had to make against the architect was that he had allowed the plaintiff to amend his claim from 85*l.* to 475*l.* Afterwards the arbitrator issued his award.

Lord Justice Mathew: Is this action to enforce the award?

Mr. Hawtin: No, my client appealed to the

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Divisional Court from the award of the arbitrator on the ground of his misconduct, and the Divisional Court dismissed the appeal, but without costs, against the defendant. The other complaint the defendant has to make is that he would never have contested the action had it not been for the advice of the architect.

In answer to the Master of the Rolls the learned counsel said he did not appear in the case in the Divisional Court, but he understood that the learned counsel then appearing had not asked for leave to appeal.

The Master of the Rolls said that in those circumstances this Court could not interfere. Counsel had better apply to the Divisional Court for leave to appeal.

Mr. Hawtin replied that it was difficult to do so, as the same judges who constituted the Divisional Court when the case was heard were not sitting together now. He asked, as that day was the last in which to enter an appeal, that their Lordships would grant an extension of the time within which the defendant could enter the appeal.

The Master of the Rolls said that this Court could not interfere.

The application was accordingly dismissed.

SOUTH NORWOOD BUILDING DISPUTE.

IN the Chancery Division on the 4th inst. Mr. Justice Buckley concluded the hearing of the case of Sabine *v.* Brind and Westbrook, an action by the plaintiff, Mr. W. G. Sabine, against the defendants, Mrs. M. R. Brind and John Westbrook, for the removal of certain houses erected by the last-named defendant on a building estate at South Norwood, in alleged breach of a covenant, or the reconstruction of the houses in such a manner as to comply with the terms of the covenant. The plaintiff also claimed an injunction to restrain defendants from erecting any buildings other than dwelling-houses. There was also a claim for damages.

The plaintiff's case was that he had purchased certain freehold land, forming part of a building estate at South Norwood, the same being conveyed to him by an indenture which contained a covenant that he would not erect any buildings on the land other than private dwelling-houses, which should not be of less value than the houses Nos. 6 and 8, Beulah-road East, Thornton Heath. The plaintiff erected some houses known as St. Helen's, which he said were superior to those in the Beulah-road, and subsequently contracted with Mrs. Brind to sell to her a portion of the land purchased by him, Mrs. Brind covenanting with him that the houses she built on the land should not be of less value than those known as St. Helen's. The plaintiff's case was that Mrs. Brind entered into a contract with the defendant Westbrook, a builder, to erect a number of houses on her land, and Westbrook, it was alleged, with notice of the covenants, had built eight houses, which, it was said, were smaller, and of less value than those known as St. Helen's. The plaintiff alleged that this depreciated his property, and brought the present action.

Mrs. Brind, by her defence, denied that the houses failed to comply with the terms of the covenant, and said that the plaintiff was aware of the erection of the houses, his surveyor having constantly seen them and made no complaint.

The defendant Westbrook, by his defence, denied that he had entered into any agreement with Mrs. Brind and that his indenture contained any covenant as suggested by the plaintiff. He also denied having notice of the covenant entered into between the plaintiff and Mrs. Brind. Westbrook also said that the houses he built on the land in question were of the same value as the plaintiff's houses, and that plaintiff knew of their erection. Westbrook further said that his agreement with Mrs. Brind had come to an end, and that he did not intend to build further.

After hearing a great deal of expert evidence as to the value of the respective houses,

His Lordship, in giving judgment, said that he should regard the houses in question as houses built for the purpose of sale, and that the intention of the covenant was that the defendants' houses should be, from a builder's point of view, of the same cost as the houses previously built on the estate. He thought it had been shown that the cost price of the defendants' houses was less than that of the plaintiff's, and their annual value was undoubtedly smaller. He thought that the covenant had not been performed, and he found that the plans for the defendants' houses had not been passed and approved by the plaintiff. In these circumstances, he granted the injunction asked for, and made an order against the defendant Brind for 200*l.* damages and the costs of the action. His Lordship explained that he made the order against the defendant Brind alone, because at the commencement of the case plaintiff's counsel agreed that the defendant Westbrook should be withdrawn from the case because no order was asked against him, but he was to have no costs.

Order accordingly.

Mr. Astbury, K.C., and Mr. Church appeared for the plaintiff; and Mr. Buckmaster, K.C., and Mr. George Hart for the defendants.

THE WIDENING OF PICCADILLY—ACTION IN THE CHANCERY DIVISION.

THE cases of Reynolds *v.* the Building and Vendor Company and the Mayor, etc., of Westminster, and Roberson *v.* the same defendants, came before Mr. Justice Farwell, in the Chancery Division this week.

These actions were tried together, the points involved being somewhat similar. In the first case the plaintiff, Mr. Walter Reynolds, an antique dealer, etc., of Walsingham House, Piccadilly, sought an injunction against the defendants to restrain them from proceeding further with certain notices to treat, claiming to compulsorily acquire from him his interest in his shop and premises, situate at No. 3, Walsingham House, which he held under a lease, and for a declaration that the said notice to treat was inoperative and invalid, and that the same be set aside. The plaintiff, in his statement of claim, stated that the defendants only required a small portion of his premises, and that the remainder was of sufficient size for him to carry on his business, and therefore their notice was inoperative and invalid. The plaintiffs Roberson and Co. claimed an injunction to restrain the defendants from proceeding upon a notice of October 20, 1903, requiring them to treat for the sale by them to the defendants of the plaintiffs' premises at No. 154, Piccadilly. In the alternative these plaintiffs asked if the defendants were entitled to proceed under the notice for an injunction to restrain the defendants from selling any part of the premises to any other persons before the same should have been offered to plaintiffs, pursuant to the provisions of section 90 of the statute, 57 Geo. III., cap. 29.

The case of these plaintiffs was that they held the premises under a lease dated December, 1896, made between Lord Walsingham and Mr. Chas. Park, trading as Roberson and Co., which comprised the ground floor and basement of Walsingham House, for a period of twenty-one years. The premises were known as No. 154, Piccadilly, and had a frontage of 17 ft., and a depth of 41 ft., with a basement. From 1896 to the time of his death Chas. Park carried on the business of an artists' colourman, and upon his death the plaintiffs succeeded to the business. The premises were of exceptional value to the plaintiffs for the purposes of their business. Walsingham House and the adjoining premises, the Bath Hotel, had been pulled down. The defendant company, the Building and Vendor Company, had acquired the freehold of the premises known as Walsingham House, including the portion leased to the plaintiffs. On October 20, 1903, plaintiffs were served with a statutory notice by the Surveyor of the Westminster Council to sell the whole of their interest in the premises to the Council, as the same were needed to widen the street. The Council intended to take off 15 ft. from the frontage. The widening had been arranged between the London County Council, the Westminster Council, and the defendant company. The plaintiffs alleged that the Westminster Council only intended to use 15 ft. of the land and to surrender the remaining portion of the site to the Building Company. The plaintiffs contended that the remainder would have afforded an excellent site for the continuing of their business. They further contended that the notice under the Act was not given in the *bonâ fide* exercise of the powers conferred by the statute, having regard to the fact that the whole of the plaintiffs' premises were not required for the purpose of widening Piccadilly, but for the purpose of facilitating arrangements between the Westminster Council and the Building Company, without giving the plaintiffs the right to retain and repurchase the same. The plaintiffs further alleged that the notice was invalid on the ground that the whole of the land to the purchase of which the notice related had not been adjudged by the defendants to project into, obstruct, or prevent the defendants from widening Piccadilly, but that the lands to which the defendants had so adjudged, as stated in the said notice, did not include the whole of the basement of the plaintiffs' premises.

The defence set up was that for the purpose of widening Piccadilly it was necessary for the Westminster Council to acquire possession of the plaintiffs' shops. Defendants said that it was impossible to carry out the improvements without pulling down the whole of the premises. The defendant Building Company were willing to let the plaintiffs have one of their shops when the building was re-erected on terms similar to those under which they now held their premises. They also said that the notices which they served were *bonâ fide*.

Mr. Upjohn, K.C., and Mr. Chubb appeared for the plaintiffs: Roberson and Co., Mr. Freeman, K.C., and Mr. Douglas Hogg, for the plaintiff Reynolds, Mr. Haldane, K.C., Mr. Jenkins, K.C., and Mr. Methold for the Mayor, etc., of Westminster; and Mr. Danckwerts, K.C., and Mr. Methold for the Building Company.

Mr. Upjohn, K.C., having opened the case, reciting the above facts, his Lordship suggested a settlement. He said it appeared to be a question of money.

Mr. Danckwerts said his clients were willing to give the plaintiffs new premises on the same terms as they now held.

Mr. Upjohn and Mr. Freeman said that other questions were at issue, including that of time, viz., the period during which the plaintiffs would be deprived of the use of their premises.

After some evidence had been given Mr. Haldane said that terms had been arrived at which were satisfactory to everybody.

Mr. Freeman, on behalf of Reynolds, said that terms had been arranged which were of interest, not merely to his client, but to the public, as now the work of widening Piccadilly at the point in question could proceed without delay. The notices to treat under Michael Angelo Taylor's Act were not to be objected to, and the matter was to proceed without any objection from the plaintiff. If the jury award the plaintiff a larger sum as compensation than that offered ten days previous to trial the County Council to pay the plaintiff's costs, as if it were under the Lands Clauses Act, to include the costs of title. Otherwise, the plaintiff to pay his own costs. Plaintiff to give up the right of pre-emption, and to remain in possession till March 25. These terms were as against the Mayor, etc., of Westminster. With regard to the Building Company, plaintiff would remain in possession till March 25 free of rent, would give the company facilities for pulling down the premises, and the Building Company would undertake to cause as little inconvenience as possible, the claim for damages being waived as against those defendants. The action to be stayed, costs being paid as between solicitor and client.

Mr. Upjohn, on behalf of Roberson and Co., said it had been agreed that his clients should be provided with two shops in the new building. He would not trouble His Lordship with the other terms, as they were very complicated.

His Lordship assented to all proceedings being stayed upon the terms endorsed on counsels' briefs.

ACTION AGAINST ST. PANCRAS BOROUGH COUNCIL.

IN the Chancery Division on the 8th inst. Mr. Justice Joyce concluded the hearing of the case of Colwell and others *v.* the St. Pancras Borough Council.

Mr. Hughes, K.C., and Mr. Beaumont appeared for the plaintiffs; and Mr. Bousfield, K.C., Mr. Younger, K.C., and Mr. Martin for the defendants.

Mr. Hughes, in opening the case for the plaintiffs, said that the action was brought by a number of lessees and occupiers of houses in Great College-street, Camden Town, for an injunction to restrain the defendants from so working their electric generating station and dust destructor as to be a nuisance. The most important point of the case was that of vibration, caused by the working of the engines in the electric generating station. The plaintiffs also complained that a nuisance was caused by reason of dust and smell coming from the dust destructor.

His Lordship asked if the defendants had statutory power to commit the nuisance complained of?

Mr. Hughes replied in the negative. He said the defendants were the undertakers for the purpose of supplying electrical power in St. Pancras. The defendants' electrical generating station had been in operation for some years—or at least a certain part of it. In May, 1902, defendants found it necessary to very much increase their power, and added to their plant three large engines of 750 indicated horse power. The engines running the continuous-current dynamos did not run in step, the result being that they did not get the thrust always at the same time. The consequence of this was that they got a certain periodic increase and decrease in the vibration. In May, 1902, the defendants began working, but not at full load. At this time the plaintiffs occupying these houses began to find at various times a very great increase in the vibration, and complaints were made, and subsequently the present action was commenced. The defendants, in their defence, said that the engines were at present defective in balance, and, consequently, did not run smoothly, but that this could be remedied if time were given for that purpose.

The following experts gave evidence in support of plaintiffs' case, viz., Colonel Rookes Evelyn Bell Crompton, an electrical engineer;

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Mr. Jas. Johnson Bourne, an Associate of the Institution of Civil Engineers; and Mr. Edmund Evans, a surveyor.

Mr. Bousfield, on behalf of the defendants, said that his clients' desire was to do everything which would conduce to the sanitary and salubrious character of the neighbourhood. Evidence would be called to prove that there was really nothing as to the dust destructor which any reasonable person could complain of. As to the electric lighting plant, it would be established that the old plant had been working ever since 1895, and nobody had ever really complained about it. When the new plant was installed, he would admit there was a certain amount of vibration caused, but that would be remedied. He submitted that a public body, doing its best to discharge its statutory duty with reasonable skill, was entitled to a certain amount of grace, and if, notwithstanding the skill and experience the body could bring to bear upon it, there was a temporary nuisance, it was not a case for an injunction. It had been suggested that the vibration at the works arose through the nature of the foundations, or, at any rate, to local peculiarities. As soon as this was suggested, defendants set to work to balance the engines more closely, and Professor Dalby, who was the greatest authority on this subject, had been consulted by the defendants on the matter, and they had every reason to hope that everything would be remedied if time were given to the engineers to complete their experiments.

On behalf of the defendants, Major Cardew, a consulting engineer, and Professor Dalby gave evidence to the effect that if time were given to the defendants for that purpose the vibration would be cured by adding balancing weights to the engines, so as to bring them into perfect balance.

His Lordship, in giving judgment, said that it was virtually admitted before him that by reason of the vibration caused by the defendants' works at various times between the months of May and December, the plaintiffs had a right to complain of the annoyance to which they had been subjected, unless it were merely a temporary annoyance. It appeared to His Lordship that, by the vibration caused by the defendants' works and machinery, so much nuisance had been occasioned by the defendants as to justify the action, unless the defendants could show that they were entitled to cause a nuisance by reason of its being, as they alleged, a temporary nuisance. He was of opinion that the amount of the annoyance caused had been a material interference with the comfort of the plaintiffs. In this particular case the annoyance caused had not been temporary, and, in his opinion, was such as was calculated to work material injury to the property of the plaintiffs, and, beyond all question, was most serious, and likely to depreciate the value of the plaintiffs' property. In this particular case there was a clause in the order which authorised the work that nothing in the order should exonerate the undertakers from any indictment or other proceedings for nuisance in the event of any nuisance being occasioned by them. In his opinion there must be an injunction, not distinguishing in any way between the old machinery and the new, restraining the defendants from carrying on these works in such a way as by vibration, or otherwise, to occasion a nuisance or injury to the plaintiffs during the continuance of their leases, and there must be an inquiry as to damages. This order would be without prejudice to any question in reference to any nuisance or annoyance that might be caused by the working of the dust destructor after March 30 next, and the defendants must pay the costs of the action.

On the application of Mr. Younger, His Lordship suspended the operation of the injunction for six months, saying there was to be no nuisance and vibration between 12 p.m. and 7 a.m., and after May 1 between 11 p.m. and 7 a.m. The inquiry as to damages would be directed to the separate interests of the plaintiffs.

ACME WOOD FLOORING COMPANY LTD. *v.* THE SUTHERLAND-INNES COMPANY LTD.—JUDGMENT.

MR. JUSTICE BRUCE, in the Commercial Court of the King's Bench Division of the High Court of Justice, on the 6th inst., gave judgment in the case of the Acme Wood Flooring Company Ltd. *v.* The Sutherland-Innes Company Ltd., which was heard at considerable length during the previous week. The facts sufficiently appear from the judgment.

His Lordship said the action was brought to recover damages for alleged breach of contract made between plaintiffs and the defendants on June 11, 1902. By the contract, which was in writing, Messrs. Churchill and Sim, brokers, on behalf of their principals, the defendants, sold to the plaintiff company about 1500 loads of American satin walnut wood (red gum) at 4*l.* 10s. per load of fifty cubic feet, c.i.f., at the buyers' wharf, Victoria Docks, London. Under the contract, about 800 loads were to be delivered during June, and the balance by the end of July. Any wood not in accordance with the contract was to be sold on the sellers' account. The breach complained of was that the defendants failed to deliver 1500 loads of red gum. The first question he had to decide was as to the meaning of the word "about." It was contended by the defendants that it meant 10 per cent., more or less, than 1500 loads. Some witnesses said it meant even a larger margin, but no evidence was given to satisfy him that there was any well-established usage in the timber trade to give so extended a meaning to the word "about." There was no evidence of a usage by which parties standing on their rights allowed so large a margin, although generally the parties to a contract did not always insist on the delivery of the full or exact amount. He thought he should be deciding in accordance with ordinary mercantile usage in determing that the word "about" meant 5 per cent., more or less. Another question was whether the defendants were liable under the contract to pay what were known as London port charges of 2s. 6d. per ton for discharging the cargo. He thought it was well established that, where goods were sold at a price to cover freight and insurance at London, the seller fulfilled his contract when he put the goods on board ship and sent the consignee the shipping documents and the policies of insurance. In such cases the consignee would be liable to pay any charges for wharfage, etc. Even if the goods did not come forward to their destination under a c.i.f. contract the consignee, having received the documents, would have his remedy against the ship and on his policies. But, under the present contract, the contract expressed that the goods were to be delivered at buyers' wharf, and the London charges were not payable in that case. But part of the timber was discharged at other docks, and the London charges became payable, and yet the defendants sought to charge plaintiffs with these charges to the amount of 89*l.* 5s. That, in his opinion, they were not entitled to do in respect of timber not delivered in fulfilment of the contract. As to the shortage of the delivery, the defendants knew that plaintiffs required the wood during the summer months in order to enable them to fulfil their contracts at Newport, Mon. In consequence of the non-delivery of the wood the plaintiffs had to purchase 142 loads of red gum at the then market price, which had increased by 1*l.* 5s. per load, which amounted to 177*l.* 10s. That sum they were entitled to recover as damages for breach of contract. Then the plaintiffs, being unable to get more red gum, had to buy 134 loads of Jarrah wood at a higher price. There was a conflict of evidence as to that. The defendants said that the plaintiffs could have purchased red gum in the market, and Mr. Alcott said that he had red gum wood in stock, and could have supplied the plaintiffs' requirements, but he was not satisfied that the quality of the wood in Mr. Alcott's possession was sufficiently good to enable the plaintiffs to use it in fulfilment of their Newport contract. Mr. Alcott had himself tendered for the paving contract at Newport, and his tender had not been accepted. He believed the evidence of the plaintiffs that they were unable to get the red gum, and that they were therefore justified in purchasing Jarrah wood in place of the red gum at 6*l.* 10s. per load, making a difference on the contract price of 2*l.* per load. They must, therefore, recover that amount. Then there was a claim for 31*l.* 8s. 4*d.* for extra cost of carriage by rail over sea freight. He thought, however, that plaintiffs could have arranged to send the wood by sea, and therefore that would be disallowed. As to the rejection of a part of the cargo of the Glenmorgan because the wood was deficient in quality, he was fully satisfied that Messrs. Churchill and Sim had properly made the rejections, and also that they, as brokers, were justified in doing the best they could to minimise the loss. It was clear that the best thing to do with the timber was to cut it up and separate the good portions from the bad, and so carry it to market to the best advantage. There was no reason why, if Messrs. Churchill and Sim could not get a better purchaser, they should not sell the rejected timber to the plaintiffs. It was suggested by the defendants that Messrs. Churchill and Sim had acted improperly, because they had acted as brokers for both parties, and had charged a commission to each, but it was not uncommon for brokers so to act. It was further said that Messrs. Churchill and Sim acted improperly because they had advanced the purchase money to the plaintiffs, but it was proved that that was a common and well-known practice in the City of London for brokers acting for both parties to advance the purchase-money to the buyer. It was established by the evidence that Messrs. Churchill and Sim were an old-established firm, and occupied a high position in the City of London, and he saw no reason for coming to the conclusion that their conduct was otherwise than right and proper. There would be judgment for plaintiffs on the claim and counter-claim, and counsel could settle the exact figures.

Mr. Hamilton said the figure agreed on was 343*l.* 16s. 4*d.*

Judgment accordingly, with costs.

DISPUTE AS TO LIABILITY FOR PAVING EXPENSES.

THE case of Lumley *v.* Faupel came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, this week, on the appeal of the plaintiff from a judgment of the Lord Chief Justice and Justices Wills and Channell, sitting as a Divisional Court of King's Bench, reversing a decision of the judge of the Kingston County Court. The case was reported in the issue of *The Builder* of May 2, 1903.

The action was brought by the plaintiff against the defendant for 25*l.* 18s. 11d., the amount of expenses incurred under Section 150 of the Public Health Act, 1875, in paving the road in front of a house known as No. 46, the Broadway, Wimbledon, of which the plaintiff was the owner, and the defendant formerly the lessee by assignment from one Gordon, to whom the plaintiff by a lease dated October 2, 1879, let the premises for a term of twenty-one years. The assignment by Gordon to defendant was dated May 29, 1893. On November 2, 1899, defendant surrendered his lease to the plaintiff, and was granted a new lease for twenty-one years as from September 29 of that year. This lease contained a covenant that the lessee would pay "all rates, taxes, and assessments whatsoever which now are, or during the said term shall be imposed, or assessed upon the said premises or on the landlord or tenant in respect thereof by authority of Parliament or otherwise." The work in question was completed in January, 1897, notice of apportionment given on January 2, 1902, and demand for payment made on May 3, 1902. The County Court Judge gave judgment for the plaintiff against the defendant for the sum claimed.

From this decision the defendant appealed to the Divisional Court, and that Court allowed his appeal, holding that the words of the covenant were not sufficiently wide to impose a liability on the tenant. Hence the present appeal of the plaintiff.

Mr. W. O. Hodges appeared for the appellant, and Mr. Danckwerts, K.C., and Mr. J. S. Green for the respondent.

At the conclusion of the arguments their Lordships held that the point involved was covered by the decision in the case of "Surtees *v.* Woodhouse," and dismissed the appeal with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

27,316 of 1902.—J. PROCTER: *Windows and Window Sashes.*

The provision in a window of a ventilating passage opening above the corners, and so arranged that it is closed by a rail, or rails, of the window sash when the sash is shut.

776 of 1903.—E. G. SIMPSON, F. C. SIMPSON, and W. J. REYNOLDS: *Method and Apparatus for Making Glass Facing Tiles, Slabs, or the like.*

An apparatus for making glass facing tiles, slabs, and the like, consisting of a heated chamber, means in said heated chamber for conveying the glass plates or the like through same to be heated, means for applying an adhesive material to one side of each glass plate or the like, a hopper containing granite chippings, coke breeze or the like, a slotted drum situate and adjustable in said hopper, to deliver the granite chippings or the like in proper quantities into the heated chamber, means for carrying the granite chippings, or the like, through the heating chamber to be heated, and for sprinkling such chippings on to the adhesive material, and means for receiving superfluous chippings.

3,754 of 1903.—J. C. ALMAN: *Locks and Latches.*

A lock consisting in the combination of a latch bolt, actuated at the under edge by the projecting arm of a gravity lever, a gravity lever pivotted in the upper forward corner of the casing, a draw-bar connecting the said gravity lever with the operating cam mounted on the knob spindle, a key bit, a key-operated stop lever mounted on projections integral with the casing and adapted to engage the gravity lever, thereby locking the same, a key-operated ring or rings encircling the said projections of the

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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casing, each ring being provided with two inwardly-directed projections adapted to receive the shoulders of the key bit, and two off-standing projections adapted to engage the shoulders of the flange of the disc of the said stop lever.

5,636 of 1903.—W. ADCOCK: *Manufacture of Water-closet Seat Hinges, and the like.*

A water-closet seat hinge, or other like hinge, consisting of two sheet metal plates, one of which has a pommel, which is raised on this plate by pressure, and passes through a hole in the other plate, and at its end is enlarged so as to secure the two plates together.

5,702 of 1903.—R. LEGGOTT: *Casement Window and like Openers.*

This invention relates to mechanism arranged and constructed for the opening, closing, and retention in the desired position, of casement, fanlight, and pivotted window and like frames. A vertical or horizontal shaft is mounted to suit the window, or like casement, and to the shaft is secured a lever provided with a sliding bar, adapted, when in its normal condition, to engage with one of a series of recesses formed in a fixed bracket preferably arranged to carry one end of the said shaft, to which are secured one or more levers, each connected by a rod to a bracket secured to the window or like frame. On releasing the sliding bar from a recess in the fixed bracket, and operating the said lever, the vertical or horizontal shaft is to some extent rotated, and the window or the like opened or closed, and there secured on the release of the sliding bar, which, on liberation, automatically engages with one of the recesses in the fixed bracket, thereby securing the window or the like in the desired position.

5,815 of 1903.—H. H. HODKIN: *Construction of Walls for Buildings.*

The construction of walls for buildings, characterised by the use of blocks, or slabs, having a vertical back and an outwardly projecting base upon which the brickwork is built, having a continuous air space, between the bricks and the slab.

5,846 of 1903.—T. G. RHODES and R. GAUNT: *Siphonic Flushing Apparatus.*

A siphonic flushing apparatus, consisting in the combination with a cistern having an outlet or discharge pipe, of a stand pipe located in the cistern in direct communication with the outer pipe, a second pipe located concentrically around the stand pipe and being perforated near its base, a gallery or open-ended cylinder located on the said outer pipe above the perforations, an inclosing bell-shaped sleeve located concentrically over the stand-pipes, having its spread-out base engaging within the said cylinder, and means for carrying and operating the said sleeve.

14,420 of 1903.—J. C. MOON and F. C. MOON: *Tiles or Bricks for Use in Regenerative Furnaces.*

This invention relates to improvements in the formation and arrangement of tiles or bricks used in the settings of regenerative furnaces for inclined and horizontal gas retorts and the like. According to the invention, the vertical tiles are made of square or of approximately square shape, and, if desired, they can be provided with a reduced central portion. At the ends of the baffle tiles, reduced portions of rectangular form are provided, and of the same width as one of the sides of the vertical tiles. The remaining portion of the baffle tiles is made of increased cross-section, in such manner that said remaining or intermediate portion constitutes shoulders running round the whole of said reduced portions. The vertical tiles are made to break joint, not only at the side linings of the waste gas and air passages, but also both vertically and horizontally in the case of the tiles forming the division walls. By the use of this construction of bevel tiles, increased support is obtained; for instance, in a regenerative furnace for gas retorts, a support is obtained in the case of any one vertical tile, not only along the whole length of its upper or lower margin, as the case may be, but also, in every alternate tier of tiles, along a portion of the vertical margins at the opposite ends of such tiles, and at every corner of all the tiles.

19,584 of 1903.—M. WEISE: *Wall-hook for Conduit-Down-or Waste Pipes.*

A wall-hook for conduit-down-or waste-pipes, characterised by two sectors for encircling the pipe, arms on said sectors, one of same being prolonged as a fastening device for connecting the hook to the wall and means for holding the sectors together and in an exact level towards each other.

19,585 of 1903.—P. CLAUSEN: *An Appliance for Gauging the Depth of Sand, Gravel, and the like.*

An appliance for gauging the depth of sand, gravel, and the like, comprising in combination a flat, graduated rod, and having a handle and a boss, a plate having a socket movably arranged upon the top of the rod, and an adjusting screw passing through the socket for the adjustment of the plate in any position.

24,268 of 1903.—C. PRANGEMEIER: *Soot Collectors for Chimneys.*

A soot collector for chimneys, comprising in combination a receptacle to be secured to the chimney, an opening in the back wall of the aforesaid receptacle, and an inclined tube constituting the lower end of the smoke channel, said tube entering the suspended receptacle through the opening in the back wall of the latter.

25,826 of 1903.—J. C. JACKSON and J. OGDEN: *Doors of Hoist Wells.*

This invention relates to improvements in or applicable to the doors of hoist wells. The essential features in the mechanism consist in hinging the door on a vertical hinge shaft, on which it can swing and also slide in a vertical direction. Under the lower hinge, and secured to the vertical shaft so as to rotate therewith, is a cam plate having a depression, into which it takes a bowl, on which bears the weight of the door at the hinge side. When the bowl is in the said depression the door is in its lowermost or normal vertical position. If now, when the door is closed, the vertical hinge shaft is rotated in the direction suitable for opening the door, it will take with it the cam plate and also the door. If, however, any attempt is made to open the door otherwise than by the rotation of the hinge shaft the first movement of the door has the effect of causing the bowl to revolve on the cam plate, and thereby to leave the depression and rise on to the elevated portion of the cam plate. Such rising of the bowl elevates the door on the hinge shaft and lifts the upper edge of the door into such a position as to meet a fixed stop, which prevents its further movement. Normally, when the bowl is in the cam depression and the door in its lowermost position, and when the cam plate and the door move together, the door clears the fixed stop.

26,289 of 1903.—W. D. BISHOP and E. G. RIVERS: *Tread for Staircases, and the like.*

A tread for staircases, and the like, comprising a frame filled with rock, asphalt, and reinforced with wire from the sides of the frame.

26,941 of 1903.—A. MAIR: *Window Fastenings.*

A window fastening, consisting of a stationary catch part for each sash, so shaped that a sliding bolt carried by the sash can be placed in any one of three positions relative to the catch, the change of the position of the bolt being capable of being effected only when each sash is in its closed position.

21,903 of 1902.—J. BLANC: *Reinforced Concrete Construction.*

A system of construction for slabs, floors, ceilings, joists, beams, columns, etc., in reinforced concrete, characterised by the construction of a skeleton or frame, formed of metallic trellis-work of longitudinal rods or bars connected by rods or bars, which, before and after having entwined the said rods or bars, pass into the floor, ceiling, etc., thus establishing an intimate connexion.

290 of 1903.—F. E. CAWS: *Apparatus for Pile Driving.*

The ram by which the pile is driven is raised and dropped by means of an electric motor stationed upon an erection or frame, which may be fastened to the pile and wholly supported thereby, or be partially attached to and supported by the pile and partially otherwise sustained, or be unattached to and unsupported by the pile and having independent support. The pile itself is held erect in position ready for driving by means of a hinged tripod clamped to the pile loosely, so that it may descend freely through the clamp. Or, as an alternative, the pile may be otherwise sustained and guided while being driven by the motor. The motor may repeat its blows automatically or otherwise, the operator being at any convenient distance.

947 of 1903.—F. PURTON: *Slabs or Coverings for Buildings and Structures.*

The improvements are as follows: The expanded metal that is used for the slabs or coverings is made with a selvage that is straight and unpierced, except in special cases for screws or nails, the slabs have the said selvage projecting beyond one of their two sides. The upper end of each slab has its top edge bevelled off, and the lower end has its bottom edge bevelled off. The bevelling of both ends being to the same, or nearly the same angle, so that if the top slab, in the case of the sloping side of a roof, is placed with its lower edge next to another similar slab, the lower end of the upper slab would overlap the top end of the second slab, and any water poured over the upper slab or rain coming upon it would have a tendency to run on to the second slab rather than down between the two slabs by way of the joint. Between all the sides and ends of the slabs a space is left. The width of the space at the sides is regulated by the width of the selvage of expanded metal that projects beyond the cement, cement and sand, or concrete; and the width of the spaces at the ends is regulated by the position of the hooks in the slabs. The spaces are filled with asphalt or other like cementitious substance, which is connected in position at the sides, and prevented from falling through by the expanded metal selvage, and at the top and bottom of the slabs by the framing upon which the slabs rest.

3,007 of 1903.—H. DEAN: *Drain and Subterranean Pipe Indicator.*

A paving brick, block, or frame, combined with a dial and disc, is arranged for the purpose of indicating the position, direction, and depth of sewers, drains, and other subterranean pipes, and the distance or position of water valves, gas syphons, and the like.

5,353 of 1903.—R. A. RAY and W. G. BAXTER: *Construction of Reversible Covers for Channelways on Footpaths.*

The cover has a top and bottom flange made of malleable iron connected by a central web running throughout its length. The outer surfaces are diamond-chequered to prevent slipping. The cover fits in a shallow groove in the channel-way, and is raised to prevent the accumulation of dirt that would block the channel-ways and stop the flow of rain water from the down spouts running into the gutter way.

25,393 of 1903.—J. J. LIESSEN: *Process of Manufacturing Artificial Stone Suitable for Pavements, Building Above and Below Ground, and for Hydraulic Purposes.*

An artificial stone, especially suitable for paving purposes, consisting of sintered or melted hydrate of aluminium, such as bauxite, which material is reduced to small particles in the usual manner, but then mixed with cement, clay, plaster, asphalt, and such like, and finally burned.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 1.—By J. H. BETHELL.

Upton Park.—378 and 380, Green-st. (s.), u.t. 58 yrs., g.r. 10*l.*, e.r. 180*l.* £2,650

February 2.—By BOREHAM & CO.

Chelsea.—29, Radnor-st., u.t. 37½ yrs., g.r. 6*l.*, y.r. 30*l.* 340
109, Beaufort-st., u.t. 46½ yrs., g.r. 8*l.*, e.r. 60*l.* 500
Pimlico.—7, Passmore-st., u.t. 17 yrs., g.r. nil, y.r. 40*l.* 320
8, Whittaker-st., u.t. 17 yrs., g.r. nil, y.r. 30*l.* 240

By C. W. DAVIES & SON.

Islington.—58 and 60, St. Peter's-st. (s.), f., y.r. 92*l.* 1,125
Old Ford.—Old Ford-rd., etc., f.g.r. 12*l.*, reversion in 37 yrs. 700
186 and 188, Old Ford-rd. (s.), and factory in rear, u.t. 36 yrs., g.r. 6*l.*, yr. 109*l.* 4s. .. 1,090

By VENTOM, BULL, & COOPER.

Kensington.—44 and 45, Kensington-pl., u.t. 44½ yrs., g.r. 12*l.*, w.r. 105*l.* 6s. 870
29, Bedford-gdns., u.t. 19 yrs., g.r. 10*l.*, y.r. 50*l.* 400

By DRIVER, JONAS, & CO. (at Guildford).

Stoughton, Surrey.—Guildford-rd., a plot of building land, area ½ an acre, f. 300

February 3.—By BROWETT & TAYLOR.

Forest Gate.—Woodgrange-rd., f.g. rents 47*l.*, reversion in 985 yrs. 1,500
Catford.—Culverley-rd., f.g.r. 10*l.*, reversion in 97½ yrs. 270
Sangley-rd., f.g.r. 22*l.* 1s., reversion in 97½ yrs. 606
Norwood.—Holmesdale-rd., f.g. rents 44*l.* 17s., reversion in 97½ yrs. 1,120

By FOSTER & CRANFIELD.

Teddington.—High-st., "Cromwell House," p.; also plot of Land in Udney Park-rd., f. (in one lot) 1,050

By HOBSON, RICHARDS, & CO.

Forest Gate.—Vansittart-rd., f.g. rents 60*l.*, reversion in 76 yrs. 1,200

By PHILIP STOCK.

Clapham.—2, St. Luke's-rd., u.t. 79 yrs., g.r. 10*l.*, y.r. 48*l.* 450
26, St. Luke's-rd., u.t. 79 yrs., g.r. 10*l.*, e.r. 50*l.* 405

February 4.—By Messrs. FOSTER (at 54, Pall Mall).

Notting Hill.—147, High-st., f.; 9, Johnson-st., also i.g.r. 4*l.* 10s., u.t. 45 yrs., g.r. 12*l.*; 7, 9, and 11, Uxbridge-st., with workshops, forge, etc., u.t. 17 yrs., g.r. 85*l.*, including builder's goodwill (in one lot) 6,700

February 5.—By WINDRUM & CLEAVE.

Victoria Park.—149, Victoria Park-rd., u.t. 48 yrs., g.r. 6*l.*, y.r. 38*l.* 380

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" at railway depôt
Red wire Cuts	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamfered, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamfered, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	29 0	per ton, "
Best Ground Blue Lias Lime	20 6	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fire Clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer in blocks	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality.*

	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
" 6 in. sawn both sides landings	2 7	deld. rly. depôt. per ft. super. deld. rly. depot.
" 3 in do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 best seconds "	12 15 0	" "
20 × 12 " " "	13 10 0	" "
16 × 8 " "	7 0 0	"
20 × 10 best blue Portmadoc	12 12 6	" "

SLATES—*(continued)*—

in. in.	£ s. d.	
16 × 8 best blue Portmadoc	6 12 6	per 1000 of 1200 at r. d.
20 × 10 best Eureka unfading green	15 2 6	" "
20 × 12 best Eureka unfading green	17 2 6	" "
18 × 10 " "	12 10 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 10 0	" "
18 × 10 " "	9 10 0	" "
16 × 8 " "	6 10 0	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depot.
Hip and Valley tiles	3 7	per doz. " "
Best Broseley tiles	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " "
Hip and Valley tiles	4 0	per doz. " "
Best Ruabon red, brown or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 " "
Do. Ornamental do.	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced	50 0	per 1000 " "
Do. pressed	47 6	" " "
Do. ornamental, do.	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.	
Deals : best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15 10 0	16 10 0	
Deals : best 3 by 9	14 10 0	15 10 0	
Battens : best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0	
Battens : best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.	
Deals : seconds	1 0 0	less thn best	
Battens : seconds	0 10 0	" " "	
2 in. by 4 in. and 2 in by 6 in.	9 0 0	9 10 0	
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0	
Foreign Sawn Boards—			
1 in. and 1½ in. by 7 in.	0 10 0	more than battens.	
¾ in.	1 0 0	"	

	At per load of 50 ft.		
Fir timber : best middling Danzig or Memel (average specification)	4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Small timber (6 in. to 8 in.)	3 0 0	3 10 0	
Swedish balks	2 15 0	3 0 0	
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0	
JOINERS' WOOD.			
White Sea : first yellow deals, 3 in. by 11 in.	23 0 0	24 0 0	
3 in. by 9 in.	21 0 0	22 10 0	
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0	
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0	
" " 3 in by 9 in.	17 10 0	19 0 0	
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0	
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0	
Petersburg : first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0	
Do. 3 in. by 9 in.	18 0 0	19 10 0	
Battens	13 10 0	15 0 0	
Petersburg : second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0	
Do. 3 in. by 9 in.	14 10 0	16 0 0	
Battens	11 0 0	12 10 0	
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0	
Do. 3 in. by 9 in.	13 0 0	14 0 0	
Battens	10 0 0	11 0 0	
White Sea and Petersburg :—			
First white deals, 3 in. by 11 in.	14 10 0	15 10 0	
" " 3 in. by 9 in.	13 10 0	14 10 0	
Battens	11 0 0	12 0 0	
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0	
" " 3 in. by 9 in.	12 10 0	13 10 0	
" " battens	9 10 0	10 10 0	
Pitch-pine : deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	
Yellow Pine—First, regular sizes	33 0 0	upwards.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine seconds	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6	
Danzig and Stettin Oak Logs—			
Large, per ft. cube	0 2 6	0 3 6	
Small "	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8	
¾ in. do. do.	0 0 6½	—	
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11	
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0	
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0	
Teak, per load	17 0 0	21 0 0	
American Whitewood Planks— per ft. cube	0 4 0	—	

Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1½ in. by 7 in. yellow, planed and matched	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot	0 11 6	0 1 6
1 in. by 7 in. white, planed and matched	0 12 0	0 14 0

WOOD—*(continued)*—

Prepared Flooring—*(continued)*—	Per square. £ s. d.	£ s. d.
1¼ in. by 7 in. white, planed and matched	0 14 6	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered by Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ..	7 5 0
Compound Girders, ordinary sections	8 2 6 ..	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ..	8 17 6
Flitch Plates	8 5 0 ..	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ..	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 10 0 ..	8 0 0
Staffordshire Crown Bars, good merchant quality	8 0 0 ..	8 10 0
Staffordshire "Marked Bars"	10 10 0 ..	—
Mild Steel Bars	8 15 0 ..	9 5 0
Hoop Iron, basis price	9 5 0 ..	9 10 0
" " galvanised	17 10 0 ..	—

(*And upwards, according to size and gauge.)

Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ..	—
" " 24 g.	10 15 0 ..	—
" " 26 g.	12 5 0 ..	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ..	—
Ordinary sizes to 22 g. and 24 g	13 5 0 ..	—
" " 26 g.	14 5 0 ..	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ..	—
" " 22 g. and 24 g.	16 10 0 ..	—
" " 26 g.	18 0 0 ..	—
Galvanised Corrugated Sheets—		
Ordinary sizes, 6 ft. to 8 ft. 20 g	12 15 0 ..	—
" " 22 g. and 24 g.	13 5 0 ..	—
" " 26 g.	14 0 0 ..	—
Best Soft Steel Sheets, 6ft. by 2ft. to 3 ft. by 20 g. and thicker	11 15 0 ..	—
Best Soft Steel Sheets, 22 g. & 24 g	12 15 0 ..	—
" " " 26 g	14 0 0 ..	—
Cut nails, 3 in. to 6 in.	9 5 0 ..	9 15 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 5 0 ..	—
Pipe in coils	14 15 0 ..	—
Soil pipe	17 5 0 ..	—
Compo pipe	17 5 0 ..	—
ZINC—Sheet—		
Vieille Montagne ..... ton	26 5 0 ..	—
Silesian	26 0 0 ..	—
COPPER—		
Strong Sheet ..... per lb.	0 0 10½ ..	—
Thin "	0 0 11½ ..	—
Copper nails ..... "	0 0 11 ..	—
BRASS—		
Strong Sheet ..... per lb.	0 0 10 ..	—
Thin "	0 0 11 ..	—
TIN—English Ingots	0 1 5 ..	—
SOLDER—Plumbers'	0 0 6½ ..	—
Tinmen's	0 0 8 ..	—
Plowpipe	0 0 9 ..	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft. delivered.
" fourths	1½d. "
21 oz. thirds	3d. "
" fourths	2½d. "
26 oz. thirds	3½d. "
" fourths	3d. "
32 oz. thirds	4½d. "
" fourths	4d. "
Fluted sheet, 15 oz.	2½d. "
" 21 oz.	3½d. "
½ Hartley's Rolled Plate	1½d. "
⅛ " " "	2d. "
¼ " " "	2½d. "

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes or barrels	0 1 8	per gallon
" " " in drums	0 1 11	"
Boiled " " in pipes or barrels	0 1 11	"
" " " in drums	0 2 2	"
Turpentine, in barrels	0 3 10	"
" in drums	0 4 0	"
Genuine Ground English White Lead	19 0 0	per ton
Red Lead, Dry	19 0 0	"
Best Linseed Oil Putty	0 7 6	per cwt.
Stockholm Tar	1 12 0	per barrel

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 6
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

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MEETINGS.

FRIDAY, FEBRUARY 12.

Royal Institution.—Very Rev. J. A. Robinson, Dean Westminster, on "Westminster Abbey in the Early rt of the Seventeenth Century." 9 p.m.

Institution of Civil Engineers (Students' Meeting).—. T. S. Nash on "The Electricity and Destructor ation at Plumstead." 8 p.m.

Hampstead Heath Protection Society.—Seventh Annual neral Meeting, in the Lecture Room, Stanfield House, gh-street, the Earl of Mansfield, President, in the air. 8.15 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. Priestley, B.A., on "Sanitary Law," II. 7 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. J. ffrey Waddell on "City Architecture." 8 p.m.

MONDAY, FEBRUARY 15.

Royal Institute of British Architects.—Professor Frank owes, D.Sc., on "The Bacterial Disposal of Sewage om Isolated Buildings," with lantern illustrations. p.m.

Regent-street Polytechnic (University Extension ectures). — Professor Vivian B. Lewes on "The nemistry of Air, Fire, and Water," III. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. Priestley, B.A., on "Sanitary Law," III. 7 p.m.

Liverpool Architectural Society.—Mr. F. Rimmington a "Small Houses of To-day and their Architects."

TUESDAY, FEBRUARY 16.

Institution of Civil Engineers.—Mr. Alphonse Steiger n "The Forms of Turbines most Suitable for Low alls." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Steegmann on "Meteorology." 7 p.m.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Dr. J. Priestley, B.A., on "Sanitary Law," II. 7 p.m.

Northern Architectural Association (Students' Sketching Club). — Annual Social Gathering and Exhibition of Sketches and Measured Drawings in the hall of the Church Institute, Hood-street. 7.30 p.m.

Dundee Institute of Architecture.—Mr. S. Carmichael n "The Place of the Nude in Art." 8 p.m.

WEDNESDAY, FEBRUARY 17.

Architectural Association, Discussion Section.—Mr. W. Williams on "The Legal Position of an Architect." 7.30 p.m.

Society of Arts.—Mr. A. R. Sennett on "Garden Cities in their Relation to Industries and Agriculture." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. R. Dudfield on "Duties of a Sanitary Inspector: Outdoor." 7 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.

Edinburgh Architectural Association.—Mr. R. H. Bow, C.E., on "The Strength of Scaffolding," illustrated by diagrams and models. 8 p.m.

THURSDAY, FEBRUARY 18.

Carpenters' Hall (Free Lectures on [Matters Connected with Building).—Professor Vivian B. Lewes on "Our Atmosphere and its Relation to Health," illustrated by experiments. 8 p.m.

FRIDAY, FEBRUARY 19.

Architectural Association. — Mr. W. H. White on "Corner Houses." 7.30 p.m.

Institution of Mechanical Engineers.—Fifty-Seventh Annual General Meeting. The annual report of the council will be presented, and the results of the ballot for the annual election of the president, vice-presidents, and members of council will be announced. The discussion on "Heat Treatment of Steel" will then be continued and concluded, after which a paper on "The Motion of Gases in Pipes, and the Use of Gauges to Determine the Delivery," will be read by Mr. Richard Threlfall, F.R.S., of Birmingham. 8 p.m.

Royal Institution.—Mr. H. Brereton Baker, M.A., F.R.S., on "Some Unexplained Experiments," illustrated. 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. R. Dudfield on "Duties of a Sanitary Inspector: Indoor." 7 p.m.

SATURDAY, FEBRUARY 20.

Royal Institution.—Right Hon. Lord Rayleigh on "The Life and Work of Stokes," I. 3 p.m.

Junior Institution of Engineers.—Visit to the Colonial Consignment and Distributing Company's Frozen Australasian Meat Store, Nelson's Wharf, Commercial-road, Lambeth, under the guidance of Mr. C. S. T. Molecey, A.M.I.C.E., Chief Engineer. 2 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at a house in Stoke Newington. 3 p.m.

Association of Managers of Sewage Disposal Works (Meeting at Westminster Hotel, New York-street, Leeds).—Mr. J. Ashton on "The Disposal and Utilisation of Sewage Sludge." 3 p.m.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ALNWICK.—For rebuilding the stone bridge at Embleton South Farm, for the Rural District Council. Mr. M. Temple Wilson, architect:—

McLaren & Co.	£95 0 0
J. & G. Green, Warkworth*	103 19 6

ASTON MANOR.—For the construction of tramlines, pits, etc., and alterations to existing tramway depôt at Witton-lane, for the Corporation. Mr. Robert Green, A.M.Inst.C.E., 37, Waterloo-street, Birmingham. Quantities by engineer:—

George Trentham, Birmingham*	£11,934 11 2

BANBURY.—For the supply of Hartshill stone, for the Town Council. Mr. N. H. Dawson, Borough Surveyor, Town Hall, Banbury:—

		per ton.
Tees Hartshill Granite and Brick Co., Ltd., Hartshill* ..	Hand-picked stone	7 9
	Coarse and fine chippings	7 3
	Machine-broken Hartshill	9 3

BLACKROCK (Dublin).—For wrought-iron railing, gates, and wickets at Blackrock College, for the College. Mr. P. H. McCarthy, B.A., B.E., 32, Bachelors'-walk, Dublin:—

G. B. Goslin	£1,300	John Elwell	£670
C. Steer & Co.	1,100	Musgrave & Co., Ltd., Belfast*	635
Kennan & Sons	730		
J. & C. McGloughlin, Ltd.	691		

[Bayless, Jones, & Bayless, Wolverhampton, and James Fagan & Sons, Dublin, gave a schedule price which in each case came to more than the lowest tender.]

BRIDLINGTON.—For erection of house and shop, South Side, Clough Bridge-road, for Mr. C. Cast. Mr. J. Earnshaw, architect, Carlton House, Bridlington:—

E. Corner	£605 0 0	A. A. Booth	£546 0 0
Storr & Son	590 0 0	S. Spink	537 14 0
W. Hoggard	572 19 6	F. Kneeshaw	534 0 0
Smallwood & Shaw	571 17 6	Sampson & Siddall*	530 0 0
C. Wilson	566 15 6		

[All of Bridlington.]

BRISTOL.—For pulling down No. 35, Mary-le-Port-street, and premises in rear, and erecting new warehouse, for Messrs. Lindrea & Co., Ltd. Messrs. Herbert J. Jones & Son, architects, 12, Bridge-street, Bristol:—

Forse & Son	£9,450 0	Eastabrook & Son	£8,320 0
H. J. Jones & Co.	9,197 0	J. Browning	8,317 0
W. Cowlin & Son	9,084 0	A. J. Beaven	8,065 0
A. E. Longden	9,080 0	R. F. Ridd	8,040 10
J. E. B. James	8,992 7	G. Humphreys	8,008 0
Stephens & Bastow	8,978 0	R. Wilkins & Sons, Bristol*	7,968 0
R. Walters & Son	8,686 0	S. Roberts	7,685 0
A. E. Denby & Co.	8,399 0	Radford & Greaves	6,824 0

CLACTON-ON-SEA.—For alteration and conversion of business premises in Beach-road, Clacton-on-Sea, for Messrs. Starling & Son. Mr. George Gardiner, architect and surveyor, Clacton-on-Sea:—

A. W. Coleman	£225 0 0	H. W. Gladwell	£193 14 6
W. H. Bray	202 10 0	James McKay*	183 0 0

CLAY CROSS.—For sinking a waterworks well, etc., for the Clay Cross Urban District Council. Mr. W. H. Radford, C.E., Albion-chambers, King-street, Nottingham:—

W. Antrobus, Stockport	£223 17 0

CLAY CROSS.—For putting down a borehole for additional water supply, for the Urban District Council. Mr. W. H. Radford, C.E., Albion-chambers, King-street, Nottingham:—

W. Antrobus, Stockport	£193 15 0

CLAY CROSS.—For laying about 2,347 yards of 8 in. c.i. pipes and taking up pipes, for the Urban District Council. Mr. W. H. Radford, C.E., Albion-chambers, King-street, Nottingham:—

H. H. Barry, Radcliffe-on-Trent, Nottingham	£330

DURHAM.—For sewerage works, Gilesgate Moor, New Durham, and Dragon Villa, etc., Belmont and West Sherburn, for the Durham Rural District Council. Mr. G. Gregson, Surveyor, 38, Saddler-street, Durham. Quantities by the Surveyor:—

Hardy & Atkinson	£5,792 2 5	F. Millward & Co.	£4,384 0 0
G. T. Manners	5,300 0 0	J. G. Bradley	4,054 12 1
Johnston & Strong	5,229 6 0	John Carrick, Durham*	3,997 4 2
J. Laing & Son	4,805 0 0		

EAST STONEHOUSE.—For construction of a concrete landing stage at Firestone Bay, for the Urban District Council. Mr. F. A. Wiblin, Surveyor, Town Hall, East Stonehouse:—

J. Shaddock, Plymouth	£1,081 19 0
A. J. Richards, Plymouth	1,079 0 0
E. Duke, Plymouth	969 18 0
T. Shaddock, Plymouth	827 0 0
W. C. Shaddock, Plymouth	794 0 0
Lapthorn & Co., Plymouth	782 0 0
J. H. Blackell & Son, East Stonehouse	779 0 0
W. E. Blake, Plymouth	750 0 0
W. T. Stevenson, Plymouth	715 0 0
T. G. Taylor & Son, East Stonehouse	695 0 0
J. Taylor, East Stonehouse	687 0 0
Matcham & Co., Ltd., Plymouth	663 0 0
T. Payne, Plymouth	644 0 0
T. Crews, East Stonehouse	595 0 0
A. Andrews, Plymouth	585 0 0
Jenkin & Son, Devonport*	550 0 0

GALLOWS PLAIN.—For alterations, etc., at Isolation Hospital, for Hertford and Ware Joint Hospital Board. Mr. W. Leonard Grant, architect, Sittingbourne:—

Ekins & Co., Ltd., Old Cross, Hertford*	£3,857

HORWICH.—For sewering, levelling, paving, flagging, etc., fifteen new streets, for the Urban District Council:—

Edward Yates, Horwich*	£3,377
Finch, Webster, & Mustanley	At Schedule of Prices.
W. J. Slater	
Peter Heyes	
Wm. Kearns	
J. Holes	
Etheridge & Clark	
Bennie & Thompson	

LEYTON.—For hot-water heating, for the Urban District Council Education Committee. Mr. W. Jacques, Architect to the Committee, 2, Fenchurch-street, E.C.:—

Allin & Sons	£461 0 0	Werner, Pfleiderer, & Perkins	£350 11 2
Haden & Sons	458 0 0		
Defries & Co.	404 14 0	General Iron Foundry	348 0 0
R. H. & J. Pearson	387 0 0	Crittall & Co.	343 17 6
G. & E. Bradley	367 10 0	Brightside Foundry Co.	343 0 0
Troup, Curtis, & Co.	355 5 3	J. T. Halsey	331 15 6
Tamplin & Makooski	355 0 0	J. & W. Jeal	318 0 0
		Lancashire Heating Co.*	318 0 0

LONDON.—For extension of class rooms and other alterations, together with repairs and painting, at the Foundling Hospital, W.C. Mr. John B. Chubb, architect, Resident Surveyor. Quantities by Messrs. C. John Mann & Son, 29, Great George-street, Westminster:—

James Carmichael	£1,920	Higgs & Hill	£1,834
William Shepherd	1,876	Parkinson & Son	1,789
Todd & Newman	1,853	Prestige & Co.*	1,759

LONDON.—For the erection of new offices in Euston-road, London, for the Hearts of Oak Benefit Society. Messrs. Essex, Nicol, & Goodman, architects, Colmore House, 21, Waterloo-street, Birmingham. Quantities by Mr. A. A. Tween, 147, Palmerston House, Old Broad-street, London:—

——	Complete Building.	Extra, if Granite instead of Portland Stone.	Extra, if Brickwork in Portland Cement instead of Lime Mortar.	Extra, if Lighting Areas Glazed Bricks.	Extra, if Wood Block Flooring.	Extra, if Oak Joiner's Work.	——
	£	£	£	£	£	£	£
J. C. Wall & Co.	50,252	1,200	641	817	586	4,051	57,547
A. Kellett & Sons, Ltd.	42,745	947	690	1,453	809	3,997	50,641
G. E. Wallis & Sons	41,884	750	434	800	626	6,000	50,494
G. Parker	42,383	923	695	1,446	795	4,058	50,300
Kirk & Randall	42,490	1,100	707	800	625	4,400	50,122
Spencer, Santo, & Co., Ltd.	43,600	811	310	707	488	3,760	49,676
C. Miskin & Sons	44,000	1,300	372	700	660	2,600	49,632
J. Smith & Sons, Ltd.	43,493	385	595	747	575	3,691	49,486
G. Godson & Sons	41,544	893	682	1,277	782	4,134	49,312
W. Downs	42,973	725	575	610	580	3,437	48,900
J. Chessum & Sons	41,480	811	310	700	656	4,586	48,543
H. L. Holloway	41,221	750	400	635	500	5,000	48,506
Treasure & Son	42,918	710	620	527	531	3,068	48,374
Stimpson & Co.	43,000	900	372	800	600	2,700	48,372
Martin, Wells, & Co., Ltd.	42,295	897	416	719	612	2,880	47,819
H. Lovatt, Ltd.	41,600	1,427	335	553	503	3,068	47,486
C. Dearing & Son	41,198	735	620	787	541	3,304	47,185
T. H. Kingerlee & Son	41,972	1,133	372	652	581	2,454	47,164
Leslie & Co., Ltd.	41,083	852	310	665	578	3,667	47,155
W. Lawrence & Sons	40,384	748	310	747	626	3,671	46,486
B. E. Nightingale	40,918	670	372	775	554	2,863	46,152
J. Shillitoe & Sons	41,300	850	372	695	542	2,300	46,059
F. G. Minter	39,470	760	610	910	590	3,226	45,566
Patman & Fotheringham, Ltd.	40,173	845	375	532	570	3,055	45,550
A. N. Coles	39,840	284	1,364	880	719	2,249	45,336
Hockley & Co.	40,082 17/6	875 8/11	620	616 18 1	648 10	2,359	45,202 14 6
C. Gray Hill*	40,000	840	620	642 17 7	670	2,237	45,009 17 7
A. Porter‡	39,638	943	248	784	578	1,002	43,193
Sabey & Son	43,118	—	No Alternative Prices.			—	—

[Architects' estimate, £43,000 for complete building.]

‡ Conditions not complied with.

[See also page 181.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom required.	Premiums.	Designs to be delivered
Proposed Free Library	Malvern U.D.C.	30*l.*, 20*l.*, and 10*l.*	April 8
*Designs for Isolation Hospital	Barnet Hospital Committee	Not stated	May 9

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
*Repairs to Anglican Church, Guildford Cemetery	.....	A. J. Sturges, 25, High-street, Guildford	Feb. 13
Two houses, Kitchen-lane, Queensbury	.....	J. Drake & Son, Architects, Queensbury	do.
Electric Light Installation, Broughton Higher Gr. Sc.	Edinburgh School Board	Crawford & Cumming, Engineers, 122, George-st., Edinburgh	do.
Steel Buoys, etc.	Trinity House Corporation	E. Price Edwards, Secretary, Trinity House, London, E.C.	Feb. 15
Sewer, Northgate-street and St. Stephen's-road	Canterbury Corporation	A. C. Turley, City Engineer, Guildhall-street, Canterbury	do.
Roads, Workhouse, Selly Oak	King's Norton Guardians	T. B. Hall & Jones, Eng., King's-ct., 117, Colmore-row, B'mingham	do.
House, Victoria-road, Elland	.....	J. F. Walsh & G. Nicholas, Arch., Museum-chambers, Halifax	do.
Timber Store Queen's Bridge, Belfast	G.N. Ry. Co., Ireland	W. H. Mills, Engineer, Amiens-street Terminus, Dublin	do.
Materials	Downham R.D.C.	H. Wayman, Clerk to Council, Downham Market	do.
Galvanised Steel Ashbins	Chorley Corporation	W. Cunliffe, Inspector of Nuisances, Fire Station, Chorley	do.
Furniture, Copley Schools	Halifax Education Committee	J. Lord, C.E., Borough Engineer, Town Hall, Halifax	do.
Paving of Birds Royd-lane	Brighouse Corporation	S. S. Haywood, Borough Surveyor, Municipal Offices, Brighouse	do.
Whinstone, etc.	Selby U.D.C.	B. McGregor Gray, Town Surveyor, Town Hall, Selby	do.
Alterations, etc., Morice Town Council Schools	Education Committee, Devonport	W. H. Crang, Secretary, Education Office, Devonport	do.
Whinstone and Slag	Bridlington R.D.C.	J. B. Simpson, Clerk, Long-lane, Bridlington	do.
Materials	Colne Corporation	T. H. Hartley, Borough Surveyor, Town Hall, Colne	do.
Feeder Mains	Preston Corporation	W. H. Tittensor, Engineer, 25, Burrow-road, Preston	do.
Furniture, Hyde Park-road School	Plymouth Education Committee	E. C. Cook, Secretary, 18, Princess-square, Plymouth	do.
Supplies	Finsbury Borough Council	Boro' Surveyor's Department, Town Hall, Rosebery-av., London	do.
Firebricks at Gasworks	Glasgow Corporation	Gas Manager, 45, John-street, Glasgow	do.
Sherston Water Supply	Malmesbury R.D.C.	C. Combes, Engineer, Tisbury	Feb. 16
Stores for the Dist. Fund, Gas & Electric. Committees	Stockton-on-Tees Corporation	Borough Engineer, Town Hall, Stockton-on-Tees	do.
Estate Offices, Goldtops, Newport	Right Hon. Lord Tredegar	G. P. Mitchell Innes, Tredegar Estate Offices, Newport, Mon.	do.
Greenhouse, Hodgkin Park, Benwell	Benwell and Fenham U.D.C.	W. P. Pattison, Surveyor, Council Offices, Benwell	do.
Additions, Heathfield Ho. Schl., Richmond-rd., Cardiff	Sisters of Providence	James & Morgan, Architects, Charles-street-chambers, Cardiff	do.
Materials	Bermondsey Borough Council	F. Ryall, Town Clerk, Town Hall, Spa-road, Bermondsey	do.
Repair of Holmesdale and other Roads	Croydon Corporation	Borough-road Surveyor's Office, Town Hall, Croydon	do.
Cast Iron Pipes	Chorley Corporation	J. W. Allin, Gas Engineer, Chorley	do.
Two-story Transit Shed, Albert Edward Docks	Preston Corporation	J. Barron, Engineer, Ribble Navigation Office, Preston	do.
Wooden Footbridge over Connswater River	Belfast Improvements Committee	Office of City Surveyor, Belfast	do.
Stone and Gravel	Salisbury R.D.C.	F. Hodding, Clerk, Market House-chambers, Salisbury	do.
Supplies (Irish Manufacture)	Blackrock U.D.C.	Town Clerk's Office, Blackrock, co. Dublin	do.
Road Materials, etc.	Tottenham U.D.C.	E. Crowne, Coombescroft House, 712, High-road, Tottenham	do.
Engine and Dynamo, Church-street Baths	Camberwell Borough Council	W. Oxoby, Borough Engineer, Town Hall, Camberwell, S.E.	do.
Annual Contracts	Bacup Corporation	Borough Surveyor's Office, Bacup	Feb. 17
Materials	Maidstone R.D.C.	J. S. Killick, Surveyor, Barming, Maidstone	do.
Free Wiring and Hire of Motors	Islington Borough Council	Electrical Engineer, 50, Eden-grove, Holloway, N.	do.
Brickmaking Plant	Gas Committee, Leeds Corporation	R. H. Townley, Gas Offices, East Parade, Leeds	do.
Machinery for Making Slabs	do.	do.	do.
Materials and Stores	Bootle Corporation	Borough Engineer's Office, Town Hall, Bootle	do.
Tools, Cement, etc.	Rochester Corporation	W. Banks, City Surveyor, Guildhall, Rochester	do.
Revolv. Sprinklers, Penstocks, etc., Sew. Wks., Earlswd.	Reigate Council	C. J. Crece, Town Clerk, Municipal Buildings, Reigate	do.
Whinstone	Tynemouth R.D.C.	J. Waters, Surveyor, Longbenton, Newcastle-on-Tyne	do.
Metal for Roads in the Gorbals, etc.	Renfrew County Council	W. H. Hill, 194, Ingram-street, Glasgow	do.
*Boundary Wall, South Park	M.B. of Fulham	Borough Engineer, Town Hall, Walham Green	do.
Street Works	Southend-on-Sea Corporation	E. J. Elford, Borough Surveyor, Southend-on-Sea	Feb. 18
Altering Railway Hotel, Abersychan	.....	T. Roderick, Architect, Glebeland, Merthyr Tydfil	do.
Broken Granite	Wigston Magna U.D.C.	Office of Surveyor, Station-road, Wigston Magna, Leicester	do.
Ninety Tons c.i. Water Pipes	Rothwell U.D.C.	J. T. Pears, Surveyor, Council Offices, Rothwell, near Leeds	do.
1,000 Tons of Lime	Salford Gas Committee	W. W. Woodward, Engineer, Gas Offices, Bloom-street, Salford	do.
Street Works, Merton	Croydon R.D.C.	R. M. Chart, F.S.I., Town Hall, Croydon	do.
Asphalting Playground at Intake Board School	Handsworth School Board	B. Bagshawe, 63, Norfolk-street, Sheffield	do.
Post Office, Portobello, Edinburgh	Commis. H.M. Wks. & Public Bdgs.	H.M. Office of Works, Edinburgh	do.
Materials	Felixstowe and Walton U.D.C.	Surveyor to Council, Town Hall, Felixstowe	do.
Concrete Flagging, Christ Church-square, Hulme	Manchester Parks Committee	Office of City Architect, Town Hall, Manchester	do.
Wesleyan Chapel, Vestries, etc., Crowle	.....	T. B. Thompson, Architect, 15, Parliament-street, Hull	do.
School Buildings, Hull	Boulevard Baptist Chapel Trustees	do.	do.
Washing Machine at Hillingdon Workhouse	Uxbridge Guardians	Mr. Copping, Master of the Workhouse	do.
Enlargement of Board Room at Workhouse	Battle Guardians	Master of the Workhouse, Battle, Sussex	do.
Science School, Boston Grammar School	The Governors	J. Rowell, Architect, Market-place, Boston	do.
*Alterations, etc., to Relief Station, Borough-road	Southwark Union	G. D. Stevenson, 13 and 14, King-street, E.C.	do.
Granite and Slag, etc.	Hardingstone R.D.C.	J. Haviland, 2, St. Giles'-square, Northampton	Feb. 19
Carting of Granite and Slag	Horncastle R.D.C.	J. E. Chatterton, Clerk, Council Offices, Horncastle	do.
Brick Bridge over River Irk, Victoria-av., Blackley	Manchester Parks, etc., Committee	City Surveyor's Office, Town Hall, Manchester	do.
Foundations for Gas-holder Tank, Penrhiwceiber	Mountain Ash U.D.C.	Corbet, Woodall, & Son, Eng., Palace-cham., Bridge-st., W'minster.	do.
Conveniences, Farnley Recreation Ground	Leeds Corporation	City Engineer's Office, Leeds	do.
Manager's House, Linkwood Distillery	.....	W. C. Reid, Architect, 2, Culbard-street, Elgin	do.
*Alteration of Prudential Assurance Company's Offices	Prudential Assurance Company	Paul Waterhouse, 20, New Cavendish-street, Portland-place, W.	do.
Supplies	Rathmines and Rathgar U.D.C.	F. P. Fawcett, Clerk, Town Hall, Rathmines	Feb. 20
Electricity Stores	do.	do.	do.
Station Lighting and Wiring to Motors	Radcliffe U.D.C.	Lacey & Sillar, 2, Queen Anne's-gate, Westminster, London	do.
Testing Instruments, etc.	do.	do.	do.
Town Clock in Clock Tower	Redruth U.D.C.	H. Page, Clerk to Council, Redruth	do.
Residence at Wadebridge, Cornwall	Mrs. Robertshaw	Town Hall, Wadebridge, Cornwall	do.
Materials	Northampton Corporation	A. Fidler, Borough Engineer, Guildhall, Northampton	do.
200 Yards Earthenware Pipe Sewer	Hornsea U.D.C.	Surveyor's Office, Public Rooms, Hornsea, near Hull	do.
Alterations, etc., to Two Cottages at Depot	do.	do.	do.
Tramway Stores	Sheffield Corporation	A. R. Fearnley, Tramways Department, Town Hall, Sheffield	Feb. 22
Scavenging, etc.	Wigston Magna U.D.C.	W. G. J. Clark, Station-road, Wigston Magna, Leicester	do.
Retorts, Fireb'ks, etc., Sowerby Bridge, etc., Gas Wks.	Sowerby Bridge U.D.C.	W. A. Bissell, Engineer, Gas Works, Sowerby Bridge	do.
Materials and Labour	Rawtenstall Corporation	Borough Surveyor, Municipal Offices, Rawtenstall	do.
Stone for Roads	Beverley R.D.C.	E. Picker, C.E., Surveyor, Beverley	do.
Alterations to Head Offices, 88, Renfield-street	Glasgow Tramways Committee	F. Burnett, F.S.I., 180, Hope-street, Glasgow	do.
*Watering Streets and Roads	St. Marylebone Borough Council	Borough Surveyor, Town Hall, Marylebone-lane, W.	do.
Haulage of Stone	.....	A. T. Davis, County Surveyor, Shire Hall, Shrewsbury	Feb. 23
Winding Shaft, etc., at Pumping Station, Falmer	Brighton Corporation	F. J. Tillstone, Town Clerk, Town Hall, Brighton	do.
Materials	Southall-Norwood U.D.C.	R. Brown, Engineer, Public Offices, Southall, Middlesex	do.
Two Houses and Shops, London-road	J. Tiffen	H. H. Hodgkinson, Architect, 9, Lowther-street, Carlisle	do.
Sewerage Works, Mortlake	Richmond Main Sewerage Board	W. Fairley, Engineer to Board, West Hall-road, Kew Gardens	do.
784 Yards Stoneware Pipe Sewers, Shepley Fields	Andenshaw U.D.C.	W. Clough, Engineer, 2, Guide-lane, Andenshaw	do.
Excavating, etc., Cemetery-road	do.	do.	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Tabernacle, Wesleyan Chapel, Rhymney	Rev. J. Rowlands	J. P. Powell, Architect, 29, Ruthin-gardens, Cardiff	Feb. 23
*Making-up Roads, Supplying Carts and Vans	Acton D.C.	Council's Surveyor, 57, High-street, Acton, W.	do.
*Supply of Materials	do.	do.	do.
Quarrying and Carting Road Materials	Midlothian County Council	Road Office, 29, St. Andrew-square, Edinburgh	do.
*Cleaning and Painting, Pitfield-street Swimming Bath	M. B. of Shoreditch	Borough Surveyor, Town Hall, Old-street, E.C.	do.
*Works and Materials	Bromley Borough Council	Municipal Offices, Bromley, Kent	do.
*Annual Contracts	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Roadmaking and Paving Works	do.	do.	do.
*Road-making Works	Walstamstow U.D.C.	Engineer to the Council, Town Hall, Walthamstow	do.
Public Baths, Picton-road, Wavertree	Liverpool Corporation	W. R. Court, Engineer, Municipal Offices, Liverpool	Feb. 24
Premises, Kiltimagh, co. Mayo	Hibernian Bank, Ltd.	W. H. Byrne & Son, Architects, 20, Suffolk-street, Dublin	do.
Tenements, Overnewton-street	Glasgow Corporation	City Engineer, 64, Cochrane-street, Glasgow	do.
*Painter's Colours, Varnishes, and Builder's Materials	Metropolitan Asylums Board	Office of Board, The Embankment, E.C.	do.
*Material for Roadmaking Works	Wood Green U.D.C.	Council's Surveyor, Town Hall, Wood Green, N.	do.
C.I. Water Pipes, Hydrants, etc.	Nantwich R.D.C.	J. A. Davenport, C.E., 152, Hospital-street, Nantwich	Feb. 25
Excavating and Laying Pipes	do.	do.	do.
Plating Wheels of Steam Roller	Cheshunt U.D.C.	R. H. Jeffes, Engineer, Manor House, Cheshunt	do.
*Two Water Vans and One Water Cart	M.B. of Woolwich	F. Sunmer, A.M.I.C.E., Borough Engineer, Maxey-rd., Plumstead	do.
*Works and Materials	Hackney Borough Council	Borough Surveyor, Town Hall, Hackney, N.E.	do.
Stoneferry Bridge Works	Hull Corporation	A. E. White, M.Inst.C.E., City Engineer, Hull	Feb. 26
Materials	Salford Tramways Committee	Tramway General Offices, 32, Blackfriars-street, Salford	do.
Materials	Newton-in-Makerfield U.D.C.	Stores Clerk, Gasworks, Earlestown, Lancashire	Feb. 27
Lyme-street Works	do.	Surveyor to Council, Town Hall, Earlestown, Lancashire	do.
Road Materials, etc.	Huntingdonshire County Council	H. Leete, County Surveyor, Huntingdon	do.
Hot-Water Supply, etc., Three Counties Asy., Hitchin	Visiting Committee	R. E. Middleton, 17, Victoria-street, S.W.	do.
Buildings adjoining Mortuary, Surbiton	Surbiton U.D.C.	Surveyor, District Council Offices, Surbiton	do.
Resetting Three Beds of Gas Retorts	Knaresborough U.D.C.	T. Mainman, Clerk, Urban District Council	do.
500 Tons of c.i. Pipes	Glasgow Corporation	J. R. Sutherland, Engineer, 45, John-street, Glasgow	do.
Alterations to Buildings, etc., at Flimby Lodge	Cockermouth Guardians	W. G. Scott & Co. Architects, Victoria-buildings, Workington	do.
*New Fire Brigade Station	Eton U.D.C.	Council's Surveyor, Council Offices, High-street, Eton	do.
Road Stone Chippings and Slag	Worcester Corporation	J. H. Garrett, County Road Surveyor, Shire Hall, Worcester	Feb. 29
Materials	Manchester Rivers Committee	Sec. of Rivers Department, Town Hall, Manchester	do.
Six Houses at Dinnington Colliery	Cramlington Dis. Co-op. Soc., Ltd.	J. G. Crone, Architect, 21, Grainger-st. West, Newcastle-on-Tyne	do.
Electric Lighting, Cambuslang	Lanark County Council	Hunter & Jack, Electrical Engineers, 101, St. Vincent-st., Glasgow	do.
*Annual Contracts	Hendon U.D.C.	Council's Surveyor, Council Offices, Hendon, N.W.	do.
*Road-making Works	Hanwell U.D.C.	Surveyor, Council's Offices, Church-road West, Hanwell, W.	do.
*Erection of Conveniences, Sydenham Wells Park, S.E.	London County Council	Architect's Department, County Hall, Spring-gardens, S.W.	do.
Stores	Wolverhampton Corporation	G. Green, Borough Engineer, Town Hall, Wolverhampton	Mar. 1
Four Engines	G.N.R. Co., Ireland	T. Morrison, Secretary, Amiens-street Terminus, Dublin	do.
Additions to Infirmary, Northwich	.....	G. E. Bolshaw, Architect, 189, Lord-street, Southport	do.
Slater Wk., Generating St. & Tr'mc'r Shed, Kilmarnock	Electric Committee	R. Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock	do.
Passenger Station, Cowley, near Uxbridge	G.N.R. Co.	Engineer, Paddington Station	do.
Seven Houses, Greenford, Middlesex	do.	do.	do.
*Sewer Works at St. James's-lane, Muswell Hill	Borough of Hornsey	Borough Engineer, Municipal Offices, Southwood-lane, Highgate, N.	do.
Waiting Rooms, Foot Bridge, etc., Paignton Station	G.W.Ry. Company	Office of Engineer, Plymouth Station	do
*Making-up Roads	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	Mar. 2
Ismay-road, etc., Works	Litherland U.D.C.	A. H. Carter, Surveyor, 25, Sefton-road, Litherland, Lancs.	do.
Sewers, Farnborough, etc., Kent	Bromley R.D.C.	A. Williams & Son, Engineers, 14, Victoria-street, Westminster, S.W.	do.
*Reconstruction of S.E. Hospital	M.A.B.	T. W. Aldwinckle & Son, 20, Benman-street, London Bridge, S.E.	do.
*Annual Contracts	Boro'. of Hampstead	Boro'. Engineer, Town Hall, Haverstock Hill, N.W.	do.
*Annual Contracts	Borough of Fulham	The Town Hall, Fulham, S.W.	Mar. 3
Covered Service Reservoir, The Heath, near Cardiff	Cardiff Corporation	C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff	do.
*New Post Office, Buxton	Commissioners of H.M. Works, etc.	Postmaster, Buxton	Mar.
*Children's Homes, Schools, etc., Hutton, Essex	Poplar Union	J. R. Hunt & Co., 181, Queen Victoria-street, E.C.	do.
Mixed School for 250 Children, Upper Hill-street	Blaenavon School Board	B. J. Francis, Architect, Abergavenny	do.
Infants' School for 150, Upper Hill-street	do.	do.	do.
*Superstructure of Northern District Post Offic	Commissioners of H.M. Works, etc.	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	Mar. 7
*Electric Power Transmission Scheme Buildings	Birmingham Dis. Board and Corp.	J. D. Watson, Engineer, Tyburn, near Birmingham	do.
*Heating and Hot-Water Supplies, etc.	Dartford Joint Hospital Committee	Robert Marchant, A.R.I.B.A., 28, Theobald's-road, W.C.	Mar. 8
Greenheart Lock Gates, Ferriby Sluice, River Humber	Ancholme Drain. & Nav. Commissrs.	A. Atkinson, C.E., Brigg	do.
*Circular Service Reservoir, etc.	Longleat Estate Office, Warminster	Willcox & Raikes, 63, Temple-row, Birmingham	Mar. 9
*Repairs and Materials, Home District	War Department	Royal Engineer Office, 41, Charing Cross, S.W.	Mar. 15
Boiler, Pryme-street Baths, Hulme	Manchester Corporation	City Architect, Town Hall, Manchester	Mar. 17
Purifiers at Gasworks, Great Float, near Birkenhead	Wallasey U.D.C.	J. H. Crowther, Engineer, at the Works	No date.
Steam Roller and Scarifier	Hemel Hempsted Corporation	W. R. Locke, Borough Engineer, Town Hall, Hemel Hempsted	do.
Alterations, etc., to Rushwood, East Tanfield	Mr. T. W. Nussey	T. Wall, Architect, Studley Estate Offices, Ripon	do.
Repairs & Paint., County Bdgs., Schools, B'dges, etc.	Northumberland County Council	J. A. Bean, County Surveyor, The Moothall, Newcastle-on-Tyne	do.
Free Library, Lowestoft	The Corporation	G. W. Leighton, Architect, 6, Prince's-street, Ipswich	do.
Road Materials	Gainsborough R.D.C.	R. Maxwell, Surveyor, Lea-road, Gainsborough	do.
*Sinking Artesian Well	Messrs. R. & W. Paul, Ltd.	R. & W. Paul, Ltd., Ipswich	do.
Two Detached Residences, Eller Carr, Cullingworth	.....	Moore & Crabtree, Architects, York-chambers, Keighley	do.
Vicarage, Chudleigh Knighton	.....	E. Sedding, Architect, 11, Queen Anne-terrace, Plymouth	do.
*Fitting-up Kitchens, New W'kh'se, Wormw'd Scrubbs	Hammersmith Guardians	Giles, Gough, & Trollope, Archs., 28, Craven-st., Charing Cross, W.C.	do.
*Fitting-up Laundry, New W'khse, Wormwood Scrubbs	do.	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Assistant-Surveyors of Buildings	Commissioners of Public Works	200*l.*—10*l.*—300*l.*	Feb. 16
*Sanitary Inspector	Woolwich Borough Council	120*l.*	Feb. 27
*Assistant Surveyors	Admiralty	£150	No date.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. xii. *Public Appointments*, xviii.

TENDERS—*Continued from page* 179.

LONDON.—For repairs to electric battery, Crossness outfall, for the London County Council:—
Electrical Power Storage Company, Ltd. £241 5 0

LONDON.—For providing and fixing a new penstock in the Farringdon road branch of the Fleet sewer, for the London County Council:—

Glenfield & Kennedy	£158	J. Blakeborough & Sons*	£108
Hunter & English	145		
Clark, Bunnet, & Co.	130		

LONDON.—For two new tail shafts for the ss. *Bazalgette*, for the London County Council:—

John Spencer & Sons, Ltd.	£192
The Darlington Forge Company, Ltd.*	174

LONDON.—For the erection of the new Kensington Fire Station, for the London County Council:—

J. Burges & Sons	£13,031 0 0
E. Lawrance & Sons	12,688 0 0
H. L. Holloway	12,428 0 0
Stimpson & Co.	12,039 0 0
Leslie & Co., Ltd.	11,950 0 0
Wisdom Brothers	11,930 17 7
Henry Lovatt, Ltd.	11,915 0 0
F. & H. F. Higgs	11,700 0 0
B. E. Nightingale	11,679 0 0
Holloway Brothers	11,603 0 0
Kerridge & Shaw, Cambridge*	10,980 0 0

LONDON.—For paving footways, Charlton-road and River-terrace, and for other work, for the Greenwich Borough Council:—

River-terrace.

A. E. Etheridge (trading as J. E. Etheridge)	£1,365 10 1
A. T. Catley { Norway kerb	1,268 0 0
A. T. Catley { Aberdeen kerb	1,358 0 0
Fry Bros.	1,209 16 0
J. Mowlem & Co., Ltd., of Grosvenor Wharf, Westminster†	1,034 0 0
E. Lamble	1,024 0 0

Charlton-road (Portion).

A. E. Etheridge (trading as J. E. Etheridge)	2,247 3 11
Fry Bros.	2,164 0 0
A. T. Catley { Norway kerb	2,090 0 0
A. T. Catley { Aberdeen kerb	2,230 0 0
J. Mowlem & Co., Ltd.	1,987 0 0
E. Lamble, Leigh-on-Sea, Essex†	1,851 0 0

LONDON.—For the rebuilding of Nos. 111 and 113, Great Titchfield-street. Mr. William Pywell, architect, Hanwell, W. Quantities by Mr. Max Clarke:—

Perkins & Co.	£5,129	T. H. Kingerlee & Sons	4,687
Whitehead & Co.	4,725	J. Carmichael	4,667
Minter	4,708	B. E. Nightingale*	4,490
Walter Wallis	4,699		

LONDON.—For the construction of a towing-path wall on the south bank of the River Lee near Bow-bridge, over the line of the Hackney Wick to Abbey Mills relief sewer, for the London County Council:—

Foster Bros.	£1,530 0 0	J. Dickson	£647 7 6
T. W. Pedrette	977 0 0	M. Dinnies	610 5 0
A. Fasey & Son	881 1 8	Pethick Bros.	553 12 0
J. A. Ewart	786 14 0	Leggott & Speight*	452 10 0

LONDON.—For drainage and sanitary work and the provision of a recreation room and new washing troughs at the Camden Town Fire Station, for the London County Council:—

F. & F. J. Wood	£928	Marchant & Hirst, 136, Highgate-rd., N.W.*	£875
Barrett & Power	882		

LONDON.—For the construction of Rotherhithe Tunnel, for the London County Council:—

J. C. Starkey	£1,929,051 13 7
J. Mowlem & Co.	1,463,477 0 0
Pethick Brothers	1,187,648 10 3
J. B. Squire & Co.	1,168,375 0 0
S. Pearson & Son	1,120,978 9 2
Price & Reeves, 15, Great George-street, London*	1,088,484 16 1
W. Kennedy	987,885 17 0
J. Smith & Co.	958,307 5 6

[Chief engineer's estimate is £1,233,349 9s. 4d.]

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MANOR PARK.—For alterations and additions at the Coach and Horses Public House, Romford-road, Manor Park., for Mr. C. R. Graham. Mr. J. M. H. Gladwell, architect, Essex House, High-street, Stratford, E. Quantities by Mr. L. E. G. Collins, 31, Great St. Helens, E.C.:—

R. G. Walters	£3,750	Todd & Newman ..	£3,137
T. H. Jackson & Co.	3,700	W. J. Maddison ..	3,085
Harris & Wardrop..	3,289	Hibberd Bros., Ltd.*	2,915

MERRYMEETING.—For wall, gates and piers, carriageways, etc., at new cemetery, for Rathdrum and Wicklow Joint Burial Board. Mr. J. Pansing, Engineer, Town Hall, Wicklow:—

James & M. Clarke	£1,443	Alex. McGowan,	
Kinlen Bros.	1,239	Arklow*	£998

MERRYMEETING.—For two mortuary chapels and a caretaker's house, at new cemetery at Merrymeeting, for Rathdrum and Wicklow Joint Burial Board. Mr. J. Pansing, Engineer, Town Hall, Wicklow:—

William Clarke ..	£812 10	Alex. McGowan ..	£675 0
James & M. Clarke	693 0	Kinlen Bros.	635 0

NEW FRODINGHAM.—For making-up Lygon-street, Cemetery-road, etc., New Brumby, for the Brumby and Frodingham Urban District Council. Mr. J. Green, Surveyor, Council Offices, New Frodingham. Quantities by Surveyor:—

W. A. S. Taylor	£334 7 6	H. Parry & Sons	£291 11 8
B. Roberts ..	331 3 8	S. Charlsworth, Scunthorpe*	220 0 0
Holliday & Horneby ..	308 5 3		

[Surveyor's estimate, £312. 3s. 10d.].

OLDBURY.—For the construction of detritus and screening chambers, storage tanks, pumping station, etc., in connexion with Warley sewerage, for the Oldbury Urban District Council. Mr. J. T. Eayrs, M.Inst.C.E., 39, Corporation-street, Birmingham:—

J. Mackay....£1,998 16 2		J. Dallow & Sons £1,543 10 0	
E. Boore	1,917 12 5		
T. Bagnall & Sons	1,705 15 3	G. E. Jackson..	1,481 4 5
H. Dorse & Co.	1,633 2 3	E. Hadley & Sons, Old Hill, Staffordshire*	1,381 6 6

PENRITH.—For the erection of two bridges, one at Lambeck, near Blencow, the other near Gill, Greystoke, for the Penrith Rural District Council. Mr. W. Lee, Surveyor:—

Lambeck Bridge.

D. Gardiner ..	£549 17 0	Millward & Co.,	
T. Telfer	300 11 0	Carlisle* ..	£244 9 8

Gill Bridge.

D. Gardiner ..	£374 19 1	Millward & Co.,	
J. Lewthwaite.	266 9 11	Carlisle* ..	£153 3 2
T. Telfer	233 7 6		

PURLEY.—For proposed two houses to be erected in Brighton-road, Purley. Mr. Frank Windsor, architect, 1, High-street, Croydon:—

Pearson & Co., Park-street, Croydon*..... £1,470

RAMSBOTTOM.—For stoneware pipe sewer in Garden-street, Athol-street, Crow-lane, and Factory-street, for the Urban District Council. Mr. J. Diggle, C.E., Hind Hill-street, Heywood:—

Thos. Turner, Heywood* £154 5 6

RAMSGATE.—For new free library, Clarendon-gardens, for the Corporation. Mr. S. D. Adshead, architect, 46, Great Russell-street, London:—

Paramor & Sons £7,250	0 0	G. Browning ..£6,636	0 0
D. Parkins....	7,250	0 0	F. G. Minter .. 6,597	0 0
Gann & Co. ..	7,065	0 0	Strange & Sons 6,561	0 0
J. H. Forewalk	7,058	19 2	A. E. Goodbourn	6,516	4 9
E. J. Newby ..	6,997	0 0	W. W. Martin..	6,436	0 0
W. J. Adcock..	6,982	4 0	Huckell & Grimbly ..	6,270	0 0
Henry Kent ..	6,950	0 0	G. H. Denne & Son	6,190	0 0
Foster & Dicksee	6,838	0 0		
T. T. Denne ..	6,769	0 0		

SURBITON.—For alterations to be carried out at The Cottage, Lovelace-road, Surbiton, for Dr. Arthur S. Taylor. Messrs. Carter & Ashworth, architects, 86, Eden-street, Kingston-on-Thames. Quantities by architects:—

E. Tomkinson ..	£714 0 0	G. F. Havell....	£622 0 0
McDonald Bros...	670 6 0	F. Hawkey, Surbiton*	590 0 0
Aldridge & Sons.	654 0 0		
Stokes & Sons ..	650 5 0		

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BASNETT-ROAD SCHOOL, BATTERSEA.—In the list of tenders for this school published in our last issue, p. 151, the amount of the tender of Messrs. Edwards & Medway, of Kennington, should have been £4,309, and *not* £3,578.

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The Builder.

VOL. LXXXVI.—No. 3185. FEBRUARY 20, 1904.

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Restaurant, Great Portland-street.....Professor Beresford Pite, F.R.I.B.A., Architect.
Competition Design for University Buildings, Cape Town.....By Mr. W. F. Harber.
House, Medmenham .....Mr. Reginald Blomfield, Architect.
Mansfield House University Settlement .....Mr. F. W. Troup, F.R.I.B.A., Architect.
Club Pavilion, Oxford .....Mr. Ronald P. Jones, Architect.
Constitutional Club, Shoreditch .....Mr. Sydney W. Cranfield, A.R.I.B.A., Architect.

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The Institute and the London Building Act.

THE Institute of Architects has now published, in the *Journal of Transactions*, the schedule of amendments to the London Building Act which, pursuant to a Report by the Professional Practice Committee, it has recommended to the London County Council for their consideration. The detailed recommendations are prefaced by some considerations in regard to general principles. The most important of these are, first, that the Act should be re-edited to secure better classification and language more intelligible to the majority of those who have to use it, who are often "inexperienced in legal phraseology." There is, however, more required than is expressed in these words, for, as we pointed out at the time the present Act was passed, there are enactments in it which, however innocently worded to first appearance, in their application result in absurdities. It is also recommended that more discretionary power should be given to the Council, the Superintending Architect, and the District Surveyors, to meet special cases arising; also a wise precaution, since there are cases from time to time in which a district surveyor is compelled, by the letter of the law, to oppose or to take proceedings for operations which he must or ought to know in his own mind are harmless in themselves; we say "ought to know," because we fear there are surveyors who rather enjoy the opportunity of exercising a little official tyranny in the name of a hard-and-fast law or by-law. But perhaps the most important of the general principles recommended by the Institute is that district surveyors should be practising architects. This is a return to the old *régime*, which was abolished we know not why, and which certainly tends to secure a higher class of men to fill the office than are likely to be secured otherwise.

We fear we must take exception to the very first proposal of the Institute, that the definitions of "street" and "way" are too comprehensive: "a court, alley, or passage not dedicated to the public and not a thoroughfare should be exempt." We do not think this is likely to be listened to; if it is made less comprehensive it is very likely to leave openings for adroit evasions; and as the Institute have also recommended greater power of discretionary action, that ought to be sufficient to cover objections to the comprehensive wording complained of. Of the other suggestions, in respect of section 5 ("Definitions") a deficiency seems to be filled up by the proposal that in clause 20, defining a "party structure," the definition should also apply to any substructure on which a party wall is erected, where such wall does not extend down to the ground or foundation level as a (legal) party wall. Clause 25 is proposed to be rendered more definite by substituting for "principally for human habitation" the words "to a greater extent than half the cubic contents," etc. This is better than "principally," a term to which it is difficult to assign a legal meaning. Two other points in the proposals in regard to the "Definitions" section fill us with astonishment; one is a demand that the term "working class" should be defined. Who is to do it? The Institute committee have evidently shrunk from the task. The other is, that *no* request is made that the word "building" should be defined. The want of such a definition is one of the greatest and most frequently criticised omissions in the Building Act, and the Institute committee pass it over without a word. The Act defines the difference between a new building and an old building, but omits to say what a building is to begin with. In the absence of any definition from the Institute, we will offer our own:—

"A Building is any erection whether roofed or not which encloses a space and which is permanently attached to or placed on the ground or (in the case of an addition) is permanently attached to the main building.

A Structure is any erection under similar conditions which does not enclose a space."

This, we think, covers everything which ought to be defined as a building. The words "permanently attached to *or placed on* the ground" cover the case where a shed, for instance, has been placed on the ground which, though removable in a structural sense, has been placed there for permanent use and is obviously intended so to remain. On several occasions it has been held in a court of law that such an erection, under the circumstances, is a "building" within the meaning of the Act. The words "or is permanently attached to the main building" cover the case of an erection, such as a small conservatory, which may be bracketed out from the main building but has no direct connexion with the ground. The addition of the definition of a "Structure" covers the case where, as is mentioned further

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on, "building or structure" are used in the Act as alternative terms.

We pointed out before, also, that "sites" ought to be formally defined, inasmuch as clause 164 gives power to make by-laws in regard to (*inter alia*) "foundations and sites of buildings"—referred to as two different things; "foundation" is defined while "site" is not. We may also again point out that "story" (or, as the authorities incorrectly spell it, "storey") is not defined; an omission which might conceivably lead to complications in a court of law.

In their "General Principles" suggestions the Institute remark that "the schedule of fire-resisting materials wants reconsideration." We do not know whether this means that it wants adding to or subtracting from; it is pretty comprehensive, besides the addition of the general clause "any material from time to time approved by the Council as fire-resisting"; and the varieties in fire-proof flooring are more extensive in the arrangement than in the nature of the materials. We should be inclined, however, to add after "iron or steel" the words "when not exposed"; and felt might be added to the list of fire-resisting materials, with the proviso "when the underside is not exposed," or "when only one side is exposed." It also should be clearly stated in the revised Act whether "incombustible" means the same as "fire-resisting." Both expressions are used in the Act, but a material may be one and not the other; thus, the "granite and other stone suitable for building purposes" are "incombustible" but they are not "fire-resisting," and in regard to such materials there ought to be some qualifying expression if they are included in the fire-resisting schedule.

In regard to section 8 the Institute make a useful suggestion in adding after "street" the words, "and throws the same open for public use," making this a requirement for the legal "commencement" of a street, which is certainly only fair to the occupier of the land. The Institute make some other useful suggestions in reference to the street sections, but they make no criticism on the rather absurd conclusion to section 8, that no person shall be deemed to have commenced a street if he do any of the acts named in the section "for some other purpose than laying out a street," a really absurd sentence to stand in a legal document: how is the law to judge of "purpose" but by outward acts? Besides, whatever the sentence was apparently meant to safeguard is provided for by the addition just suggested as to throwing open the street; under that sentence he has not "commenced" a street until he throws it open to the public; that is the real test, and this absurd clause about his "purpose" should be withdrawn at the same time.

These are minor matters, but it is little credit to the enterprise or the perception of the Committee that they have made not the slightest attempt to suggest an improvement on the wretched provision of section 12, which ordains 40 ft. as the width of the ordinary London street and 60 ft. as the extreme limit of width in exceptional cases. The idea of these limits being permanently accepted as the limits of width for London streets—*i.e.*, an average width equal to Chancery-lane, and an extreme width, in special cases, hardly equal to that of the eastern portion of Oxford-street (which is 63 ft.)—is really contemptible, whether we consider it from the point of view of architectural effect, sanitary conditions, or convenience of traffic; and the fact that a Committee of the Institute, drawing up suggestions for the amendment of the Building Act, could pass over these clauses without making even any tentative suggestion for their alteration, seems to show that the Practice Standing Committee was hardly the proper body to entrust this work to. There should have been a special committee appointed who would have had their eyes open to architectural as well as to business considerations. We take it that this condition must be altered, or the London County Council will stultify itself; but it would have been more to the credit of the Institute of Architects if they had been the body to suggest and to press on the governing authority the inadequacy of the street widths contemplated by the existing Act. Probably the sole reason for carefully ignoring this question is the necessity for compensation where a street is gradually widened from its former dimensions; but, if we are ever to see London streets of an adequate width, compensation must sooner or later be faced, the necessary addition to the rates being a lesser public evil than the choking of our streets by inadequate dimensions.

Section 21, putting the School Board buildings out of the operation of the present Act, which ought never to have been introduced, it is proposed to omit "as obsolete." A constant source of contention in regard to the line of frontage of corner buildings it is proposed to remove by an addition to section 22 (1), to the effect that in the case of a new building at the corner of two streets the superintending architect "shall have regard to the general line of frontage of the principal street only," on the principle that a building only fronts one way. No notice is taken of the anomaly of the words "building or structure" in section 26, which are used as if they had different meanings, while the meaning of neither has been defined; and the Committee make no further suggestions till we come to section 39, where, in accordance with a previous alteration, it is proposed, instead of "wholly or principally as offices," etc., to read "to a greater extent than half the cubical contents as offices, counting-houses, or business premises other than buildings of the warehouse class." This is certainly an advance in clearness of definition.

In regard to section 41, referring to spaces in connexion with buildings, the words "space open to the sky" are proposed to be substituted for "open space." This may be on the safe side in definition, though one could hardly think that there could really be any question as to what is intended by "open space." In reference to clause 2, requiring that such open space "shall extend through the entire width of such building," etc., the committee propose to substitute the following:—

"No building shall in any part thereof be nearer to the rear boundary of the curtilage thereof than 10 ft. provided that in the case of any building upon a corner site the said area may be arranged in a convenient position to the satisfaction of the superintending architect and not necessarily extend the entire width of the rest of such building."

This is another and praiseworthy attempt to get rid of the constructive injustice to which owners of corner lots are subjected, in one way or another, from the wording of the existing Act. In regard to section 47, which deals with the limit of height of buildings, the Committee, again taking into consideration the difficulties of the corner lot, propose the following paragraph to be inserted before the last paragraph of the section:—

"Where any building is erected or intended to be erected on a corner plot so as to abut upon more than one street the height of the building shall (unless the Council otherwise consent) be regulated by the wider of such streets so far as it abuts or will abut upon such wider street and also so far as it abuts or will abut upon the narrower of such streets to a distance of 40 ft. from the building frontage in such wider street. The height of the remaining portion of the frontage to the narrower street shall be limited by the section regulating the height of buildings in such street except that it shall be lawful in such case where the buildings previously existing on such remaining portion were of a greater height to rebuild them to the same height or heights."

In considering section 49, we are again astonished to find that the Committee have made no protest against the absurd anomaly by which, according to the existing Act, a street 6 in. less than 50 ft. in width is restricted to buildings the same height as the width of the street, while a street 6 in. over 50 ft. in width may be lined with buildings 80 ft. high. This anomaly is not, of course, so plainly specified in words, but that is the effect of the section, which we pointed out in the strongest manner at the time when the present Act was under consideration; and it seems extraordinary that a committee appointed to consider the improvement of the Act should have let such a point pass them without notice or suggestion. It is one of the greatest absurdities of the existing Act, apparently arising from nothing but the desire to save the trouble of more detailed regulation of heights. The rule, plain and simple and easily laid down, ought to be that the flanking buildings do not exceed in height the distance between the opposite frontages. The Act lays down this principle in regard to any street under 50 ft. in width, and immediately quits it as soon as that limit is passed. It is perfectly ridiculous; it is contrary to common sense, to sanitary conditions, and to architectural effect; and what are we to think of a committee of the Institute of Architects who let such a point pass them without note or comment, while splitting hairs about points quite unimportant in comparison? It is to be hoped, at all events, that the County Council will not suppose that the Professional Practice Committee adequately represents the perception of the architectural profession on such matters.

With Section 53 we come to the reference to the schedule of thicknesses of walls appended to the Act. As to the section itself, the Committee propose the addition of the following words:—"Except as hereinafter provided under the section relating to steel construction," which is, of course, a reasonable and even necessary addition. We now turn to the end of the Committee's proposals to see what they have to say in regard

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to the "First Schedule." The Committee pass over the obvious (as we should have thought) contradiction in terms of Sections 3 and 4 of the schedule, of which 3 says that "any" wall not built of the class of materials before described, shall be one-third thicker than the schedule thickness; while 4 proceeds to say, immediately after, that walls of houses, built of other materials than specified, shall be sufficient if built of the thicknesses specified in parts 1 and 2 of the schedule. The two are an absolute contradiction in terms; and Section 3 is a contradiction in itself, since it is headed "thickness of stone walls," and refers to walls "built of *brick or stone* in horizontal courses," as if brick walls could be built otherwise. The Committee take no notice of this; but the first thing they do is to suggest the abrogation of what we described at the time as the exceedingly wholesome rule embodied in Section 5, to the effect that in hollow walls there should be a wall at one side of the cavity of the full thickness prescribed by the Act. Instead of this the committee propose a long clause, having the effect that hollow walls may be constructed where the aggregate thickness of the two equals what is prescribed by the Act, and where there are approved ties between them, and that the inner wall be not less than 8½ in. thick. This seems to be a distinct step backward in sound building, and evidently suggested in the interest of building-owners. An addition to section 8 provides that where a wall without return walls is divided into portions of different heights, "the thickness of each of such portions shall be governed by the height of such portion and by the length of the entire wall." This supplies a detail of definition overlooked in the Act, which practically only contemplates walls of the same height throughout their length; and it is a reasonable emendation. But we cannot approve of the following proposed new section:—

"If any external or party wall measured from centre to centre is not more than twenty-five feet distant from any other external or party wall to which it is tied by the beams of any floor or floors other than the ground floor or the floor of any storey formed in the roof the length of such wall is not to be taken into consideration in deciding the thickness."

This seems plausible, but it is a move in the direction of less solid and substantial building, and as such we regret that it comes from the Institute of Architects. It is again a demonstration in favour of the client, not in favour of the best building. A floor, or a series of floors (and the clause does not demand even that), may be made as much of a tie as a cross wall, or nearly so, but there are many cases and many forms of floors in which this will not be the case; and it will be observed that no reservation is made as to the type of floor; it may be only ordinary wooden joists; and if there is one such floor as this between the ground floor and roof, this is to put the length of the wall out of consideration; and in the case of a fire, in which this floor is burned away, matters will be still worse. If there had been any careful definition of the kind of floor which might form the best and most solid tie between walls it would be different; but there is none. In this and some other instances the Committee give one the impression of having been actuated rather by a desire to secure cheaper building for their clients than to carry out the best conditions of durability and stability in building. Again, in the second section of Part I. of the actual schedule, which rules that a wall less than 30 ft. in length and comprising more than two stories, may be 8½ in. thick for its whole height, the Committee coolly suggest striking out the words "does not comprise more than two storeys," without suggesting any other limitation, leaving it in effect that a wall not more than 30 ft. in length may be carried to any height you please at a uniform thickness of 8½ in.! Did the Committee really contemplate that result? and if not, why did they not think better of the meaning of what they were doing? The alteration is an ill-advised one in any case; the existing provision is a perfectly reasonable one; but to remove the restriction without suggesting any other in regard to height is an act of absurdity which one must regret to see.

We shall return to the subject in another issue.

THE STORAGE OF FLOOD WATER.

FROM every part of the country we have lately had tidings of heavy rainstorms and disastrous floods. The state of things in the Thames valley particularly attracts the attention of those living in or near the metropolis, but the damage done in various provincial districts is very serious. The strange thing is the apathy with which inundations of the kind are regarded by governing bodies. Periodical floods on one hand and droughts on the other are alike accepted with Oriental fatalism, and no attempt is made to deal with them in a practical manner.

Those who have studied the vagaries of British rainfall know that we generally suffer from the alternating succession of wet and dry periods of various intensity and duration. From 1875 to 1883 we had an exceedingly wet period, and the floods then caused by excessive rainfall directed a certain amount of attention to the necessity of legislation for the conservation and utilisation of flood waters. Since 1884, however, there has been an unusually dry period, and the comparative absence of floods probably accounts for the fact that nothing has been done in the direction indicated above. Nevertheless, water engineers are perfectly agreed upon the necessity for the adoption of measures by which extremes of water supply may be adjusted from season to season and from year to year. Even in average years the volume of water wasted during the winter would be of immense value if it could be stored for use in the summer. In addition to the utilisation of rainfall for domestic and trade purposes, it might be employed for the improvement of rivers and, in many cases, for the development of power. In other countries the desirability of storing surplus water for use in periods of drought is fully recognised. In Russia flood water is collected and used for irrigation and other purposes, and a similarly intelligent policy is pursued in India. We have a recent example in Egypt, where the construction of reservoirs has permitted the storage of water with great advantage, not merely to the inhabitants of the Nile Valley, but to the community at large. Nothing of the kind has ever been attempted on a comprehensive scale in England, although the matter is clearly of national importance and the necessity for such treatment has long been recognised by engineers.

The advantages that would follow the systematic regulation of the Thames and its tributaries should be sufficiently obvious. So far as concerns the practicability of such a scheme, we may refer to the opinion recently expressed by Professor Henry Robinson, that the flood waters of the Thames and its tributaries might be conserved at small cost from more than one gathering ground that he has investigated. As we have said on a previous occasion, we have no doubt whatever that the proper storage of surplus waters would have the effect of greatly diminishing, if not of entirely preventing, the serious floods prevalent in the Thames valley and of furnishing an ample surplus of water for the future requirements of the metropolis. The storage of flood water would also make it possible to augment the flow of the Thames in dry weather, thereby improving the sanitary condition of the river and rendering it more useful as a highway for navigation. A similar course of treatment could also be adopted in the case of other rivers throughout the country with much advantage to the community, and it is clearly time for the subject to be taken up by Parliament without further delay.

NOTES.

The Labour Market.

THE statistics furnished by the Board of Trade in relation to employment, and which are based on information derived from the Trades Unions, do not disclose any great signs of improvement. On the average for ten years, January showed an increase in the number of unemployed of nearly 2 per cent., and the whole of 1903 discloses an increase of about 1 per cent. The bad weather seriously affects outdoor occupations, and especially agricultural labour. The building trades may in a less degree have suffered from the same cause, although an open winter is, on the whole, favourable; but other causes must chiefly be responsible, since the report shows that a decline in the demand for labour in the building trades has continued ever since the year 1900.

The Public Health Acts v. Tenants' Liabilities.

IT is welcome news that some legislation is contemplated in connexion with the Public Health Acts, but it is to be hoped it will not take the form of a consolidating statute alone, but that some attempt will be made to simplify the law also. The case of *Lumby* v. *Faupel*, decided in the Court of Appeal last week, settled an important point under section 150 of the Public Health Act, 1875. Stated shortly, the decision is that the terms of a lease which contained a covenant to pay "all rates, taxes, and assessments whatsoever which now are or during the said term shall be imposed or assessed upon the said premises, etc.," did not place upon the tenant the liability to pay for paving expenses which had

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been carried out and completed before the commencement of his lease, but which had not been apportioned amongst the frontagers under section 150 until after the commencement of the tenancy. We commented upon this case when it was heard in the Divisional Court. The learned judges there based their decision upon the ground that the word "assessments" did not embrace the paving expenses. The judges passed very stringent remarks on the state of the law on this point, and the difficulty there was in arriving at any satisfactory decision. We have commented on the various cases decided upon the point during the past few years, and tenants cannot be too careful in taking advice on these covenants in leases which, under the existing Local Government Acts, may impose quite unlooked-for burdens upon their shoulders.

Arbitrators' Fees. A CASE of considerable importance to litigants and to arbitrators was decided last week by the Court of Appeal. A dispute between a water company and an urban district council was referred to arbitration; two arbitrators were appointed, and also an umpire, and an award was made of over 13,000*l.* in favour of the water company. The costs of the successful party were duly brought in for taxation—that is, for review by a legal official, so that the unsuccessful party should pay no more than was reasonable. On the taxation the Taxing Officer disallowed 119*l.* 5s. of the total of 476*l.* 12s., the amount charged by the umpire and arbitrators as their fees, and, therefore, the water company had to pay the balance out of its own cash-box, since it could not be recovered from the district council. Not satisfied so to do, the water company commenced an action to recover back the sum from the umpire and arbitrators, on the ground that the amount charged by them was extortionate, and on the trial judgment was given for the claim. This judgment has now been reversed by the Court of Appeal, because it could not be held that the amount charged was extortionate. It may have been large, and even unusually large—though we do not say it was—but it clearly was not extortionate, which was the only ground on which the money could be recovered back. The moral of the whole business is that, if parties call in as arbitrators and umpires men of high professional position who make large incomes, they must expect to pay large fees; though it should be noted that the amount charged is less than 5 per cent. on the total award. The case exemplifies again, too, the absurdity of having two arbitrators and an umpire—the former are merely advocates for their respective sides, and their employment is an absolute waste of money. One arbitrator is not only less costly than two arbitrators and an umpire, but is equally effective to decide a dispute.

Matter and Electricity. THE article on "Matter and Electricity," by Mr. Whetham, in the *Quarterly Review*, to which we have already referred, is one of very great interest and importance. Mr. Whetham was one of the earliest explorers in the field of electrolysis, and his researches on ionisation and the velocity of ions have given him a European reputation. He discusses the question of what electricity is from the physical rather than from the mathematical point of view. In modern science the chemical atom is supposed to be made up of corpuscles. These corpuscles, or electrons, as they are called in mathematical theory, are in rapid orbital or oscillatory motion within the atom somewhat like the planets within the solar system. Now it can be proved that an electric charge moving rapidly has appreciable inertia—that is, it acts as if it had mass. Hence we can, if we please, explain mass by saying that it is electricity in motion. The metaphysical question then arises, Has matter any objective reality? Granting that it is only disembodied energy, the further question arises, What is the nature of electricity? and here neither the physicist nor the mathematician help us. Matter may be explained by saying that it is merely electric charges in motion, but the ultimate mystery is, if anything, intensified. Mr. Whetham considers what light recent discoveries in radio-activity throw on this subject. By definite processes we can obtain from thorium minute quantities of substances which are much more radio-active than thorium itself. The original thorium is now less radio-active. In a few days the products have lost their radio-active properties and the original thorium has recovered. The only explanation seems to be that some change was made in the constitution of the atoms themselves during the original process; in fact, that a partial but true transmutation of the elements was accomplished, thus in part realising the dream of the mediæval alchemist. Radium is a substance in an unstable state gradually turning into matter. It seems permissible to suppose that millions of years ago nearly every substance was radio-active, or even that radio-active substances themselves may have been formed by the disintegration of parent atoms which are now non-existent on our globe. We know that radium is undergoing a continual but slow (from the human point of view) process of evolution into another substance. May not all matter be doing the same? We are no longer justified in making the assumption that all matter is essentially eternal and unalterable.

Electrically-Driven Concrete Mixers. IN view of the fact that electric motors are now being applied in almost every branch of industry, it is somewhat to be regretted that building and other contractors are so slow to take advantage of the latest means for working their machinery and plant. There are many places in which the application of electricity for driving concrete mixers would be of very great service, and far more convenient than the mechanical transmission of power. Even when current is used for the purpose of lighting on structural works, it is generally the case that no other application of electricity is made. Yet the extreme convenience of the electric motor, and the ease with which it can be adapted to work in positions where power cannot readily be transmitted by shafting or belting, should commend it to all. Concrete mixers, especially, have often to be fixed in most inconvenient places for the transmission of power, but when electricity is available it is perfectly easy to arrange for electrical driving. A very useful type of electrically-driven concrete mixer, recently used in the construction of a retaining wall at one of the works of the Carnegie Steel Company, was driven by a motor by means of flexible chain and intermediate gearing, and being mounted on a two-wheeled truck, the whole apparatus could be moved from point to point along the wall, in a manner that would have been impossible with a machine driven from a steam engine.

The Brooklyn Bridge. ANOTHER addition to the cross-river facilities between New York and Brooklyn is suggested by the proposed reconstruction of the well-known Brooklyn Bridge, so as to increase its capacity without overloading the existing masonry. The scheme includes the conversion of the present single-deck structure into a double-deck bridge, with accommodation for four elevated and two trolley tracks and two 17 ft. wide roadways. In the new design it is proposed that the cables shall carry the live load and the weight of the floor construction proper, and that the stiffening trusses shall carry their own weight and that of the wind and lateral bracing. The cost of the work is estimated at over one million pounds, and the reconstruction will give accommodation for double the present traffic. We understand that the plans recently submitted by the Bridge Commissioner are not final, being intended simply as a basis for further detailed study, which, it may be hoped, will include consideration of the existing terminal facilities. Unless these are considerably extended, it would be of little use to enlarge the bridge structure as the terminals are at present the main cause of congestion during busy times of the day.

Hampstead Heath Protection Society. THE Seventh Annual Report of the Hampstead Heath Protection Society shows that the Society are doing all they can to preserve the Heath from the various injurious influences which threaten to destroy its old character, but we fear it is a rather discouraging fight against persistent encroachment. The Committee regret that what they call the "misplaced trees" on the east side of Spaniard's-road still remain, and as they grow will block out "the much-admired view of London." This seems a little capricious, for surely people do not go to Hampstead for a view of London, but rather to forget it and to feel how thoroughly (at present) they are in the country at such a short distance from London. The Committee regret, and here we are entirely with them, that the site of "The Pryors" was not saved from the builders, but that huge blocks of flats have been built there. The County Council, we are glad to find, have supported the Committee in getting Easter "shows" removed from the neighbour-

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hood of the East Heath-road. The Committee are strenuously prosecuting their scheme for securing 80 acres of ground to interpose between the Heath and the buildings which will probably be erected on the Eton College land near the North-west Heath. A large sum of money has already been promised for this purpose, and it is hoped that this praiseworthy scheme is in a fair way to be realised. A shelter for birds has been completed, and the Committee suggest that every opportunity should be taken of planting and promoting the growth of such wild flowers as were formerly plentiful on the Heath, but are now in danger of extinction.

Marble Tables in Churches.

IT is the law that a fixed stone or marble table, otherwise an "altar," is illegal in an English church. This state of things has produced, in regard to St. Luke's, Chelsea, a rather curious difficulty. It appears that it was intended to place in that church, as a memorial to the late vicar, a marble table or altar—marble being selected on the advice of the architect for artistic reasons. When the faculty was applied for the application was, in the first place, for a marble structure on brass castors, this being regarded as a sufficient compliance with the law; on the advice of counsel, however, the application was amended so as to be for a structure with a wood top and marble sides and ends, so that it was more nearly a table and less an altar in character. When the case came before Dr. Tristram in the Consistory Court of London last week, it was adjourned, that the amended petition might be served, but it would seem that there will be no opposition to the application in its new form. We confess, however, that the structure appears so hybrid in character that it cannot have artistic merit; a wooden table covered in part with marble mosaics is, in fact, a sham, and shams never were and never will be really artistic.

Coutts' Bank, West Strand.

MESSRS. COUTTS AND CO. will shortly remove to the new premises built for them by Messrs. Holland and Hannen after Mr. J. Macvicar Anderson's plans and designs. For their new banking-house they acquired the Lowther Arcade, with frontages in Adelaide-street and the Strand, erected in 1830-2 from designs by Witherden Young, who was architect also of the adjoining Adelaide Gallery (since absorbed in a well-known restaurant) for Jacob Perkins, the engineer, in the three-sided block built by Burton, as part of the improvements made in the West Strand district under the Act 7 George IV., c. 77. The Arcade, closed in April, 1902, consisted, as originally designed, of twenty-five shops, with six more at the two ends in Adelaide-street and West Strand, covering about 16,000 sq. ft. and held from the Crown under one lease, of which twenty-seven and a half years were then unexpired, at a ground rent of 1,270*l.* per annum. The London County Council have bought the lease of the present banking-house for additional offices. The north portion is comprised in the block that was built on the site of the Burse of Britain, commonly known as the New Exchange, as erected in 1608-9. To that block, at the sign of the Three Crowns, on land leased to him by Lord Salisbury, George Middleton removed from St. Martin's-lane. He died in 1749; his successor, George Campbell, goldsmith and banker, took as partner, in 1755, his niece's husband, James Coutts, a son of John Coutts, Lord Provost of Edinburgh and founder of the bank in old Parliament Close, Edinburgh. The brothers Adam rebuilt the banking-house for James and his brother Thomas, making a subway to the strong-rooms on the south side of William-street in the Adelphi. Thomas Coutts (*obiit* 1822) arranged with Robert Adam for the laying out of Robert-street so as to preserve the view from his drawing-room across the river to the Surrey hills beyond. In 1799 he obtained an Act, 39 George III., c. 1, for "a covered passage" or bridge across William-street. The Baptist chapel at the corner of James and William streets was afterwards taken for an extension of the premises, and in 1838-9 some alterations and improvements were carried out by Thomas Hopper for the firm who, in June, 1892, were reconstituted as Coutts and Co.

Royal Academy Lectures.

DR. MURRAY commenced on Monday the first of a course of historical lectures on sculpture, his subject being "Sarcophagi," or, rather, the sculptures with which they were adorned. He observed that the normal ancient Greek funeral, the burning of the body, was usually on a hill, with the idea that the soul of the departed would thence more readily ascend to the gods; but hills were not always available. The body of Patroclus, for instance, was burned upon the plain of Troy, and games and mock combats solemnised the occasion. Hence, when sarcophagi came into use, such celebrations formed the subject of their decorations. The earliest sarcophagus illustrated, however, that of Clazomenæ, was not sculptured but painted, and represented the defeat of the Cimmerians, and as an episode, the execution of Dolon. He turned next to a marble sarcophagus of about the same date, now in the New York Museum. This was in a fine style of low relief, and though found in Cyprus, was probably made in Asia Minor, for the work was too good for Cyprus in the VIth century. This showed hunting scenes—probably indicative of the occupations in the future life—and a banquet scene, in which one man, the deceased, was seated separately from the rest; a tree introduced was, no doubt, a symbol of Elysium, since actual Greek banquets were not held in the open air. He showed also a Lycian relief of about the middle of the VIth century, found by Sir C. Fellows; probably part of one of those gabled Lycian tombs of which there is an example in the British Museum. A gable end of a tomb, which might have been connected with this relief, showed two sphinxes sitting, facing each other; emblems which were always associated with death and disaster. But there was another form of Lycian sarcophagus, that which was placed aloft on the top of a square pillar or stele, of which the Harpy Tomb in the British Museum was an example. In the figures on this tomb it was noticeable how the sculptor had carefully distinguished the effect of the transparent drapery which formed the under garment from the opaque drapery worn partly over it. They then had to skip two or three centuries to get to the next sarcophagi of any note — the Sidon set in the Constantinople Museum. Here there was a great change in the subjects and treatment; we had centaurs attacking Lapithæ with wine-jars; and the sphinxes on the pediment were seated back to back, a much less impressive attitude, with their wings towering up to the apex of the pediment; they had, in fact, almost ceased to be symbolic, and became merely decorative, like the griffins on the opposite pediment. The centaur subjects of the Theseum and of the Phigaleian marbles (Vth century) were exhibited as a contrast to those of the Sidon sarcophagi, representing a finer sculpturesque style. Another remarkable sarcophagus from the Sidon set was then shown, looking like a model of a Doric temple, with the inter-columniations built in, and each occupied by a figure in high relief. The probable meaning of these figures was that they represented relatives, who would from time to time visit the tomb. The most celebrated of all the Sidon sarcophagi was that named after Alexander, as it was concerned with his exploits, represented in crowded alto-relief. It did not follow, however, that it had any connexion with Alexander, but perhaps introduced his battles merely as historic events available for decoration. A comparison of the Sidon sarcophagi with the older examples showed that, though there was much more finish of execution, the sculptors had merely repeated older ideas of which they had lost the true meaning, and brought nothing of their own into the work but mechanical execution.

Water-colours at Messrs. Agnew's Gallery.

THE Thirty-eighth Annual Exhibition of high-class water-colour drawings at Messrs. Agnew's Gallery in Old Bond-street is a dream of delight. The amount of beautiful work by eminent painters crowded into this room forms a collection so rich that it is difficult to do justice to it. On the first wall a considerable number of rather small drawings by De Wint and Barrett are effectively contrasted. Barrett is a very good foil to De Wint, his graceful and pretty classical landscapes contrasting with the broad style of the greater artist, though it may be admitted that the peculiar greatness of style of De Wint comes out more forcibly in work on a larger scale. His "Gloucester" (6) shows a grand sky, however, and Barrett's "Morning" (17) a most beautiful treatment of distance. One of Barrett's, "The Haywain" (39), is different from any other work of his that we know, and curiously modern in feeling. Some of David Cox's smaller drawings suggest a doubt whether he did not carry freedom of execution a little too far at times, but he is seen at his best in "Blackberry Gatherers" (32). There are a number of works by Prout, showing him at his very best in his peculiar style, which, from the present point of view, looks as if it had been developed with a special regard to reproduction by chromo-

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lithography; but what he aimed at he did thoroughly well. Cattermole is another name reminding one of the past; an artist who seems to have been sent into the world for the special end of illustrating Scott and "the buff-jerkin business." There is a good specimen of Girtin, and an early Turner, "Wakefield Bridge" (42), which reminds one of his debt to Girtin; there is also Turner's large "Kilchurn Castle" (41) with the rainbow. Copley Fielding is a reputation that hardly bears reviving; his stage trick of the sail against a background of thundercloud is too cheap; and E. Duncan, once also a leading sea painter, falls a good deal under the same condemnation; his "Ploughing" (69) is far more interesting than the class of works by which he made his reputation. Copley Fielding, too, redeems himself in "Near Shoreham" (111), a quiet landscape with a beautiful sky. W. Hunt's studies of boys and of fruit and flowers, all hung together, are a brilliant testimony to his thoroughness of execution and his versatility; no one who did not know his work would assign all these to the same hand. Thos. Collier is represented by some fine works, notably by "On the East Coast" (67), a small picture of the highest rank, and also, equally fine, "A Path Across the Moor" (119). Among the small works on the screens is Fred. Walker's beautiful little interior with two girls looking out of the window, called here "The Rainbow" (154); it used to be called "The Thunderstorm." There are a number of Birket Foster's, perfect in their style, but it is a bad style; and a little work by Linnell (187), which is worth them all. On the other screen are a number of small drawings by Turner, including some of his book illustration works, and a beautiful little drawing of shipping in "Portsmouth Harbour" (261) by Stanfield. There are many more that we have not space even to mention.

The Dudley Gallery.

THE water-colour exhibition of the Dudley Gallery Art Society represents the *juste milieu* rather than the highest level of painting, but the present exhibition (the fortieth) contains some works of real excellence, such as Signor Giampretri's "Terrace of Villa Lante" (46*), with its carefully painted row of ancient stone vases; everything in the drawing is complete and thorough in execution. Mr. L. Burleigh Bruhl's small drawings all have individual style and character. "Evening in a Cornfield" (1), by Mrs. Gregory, and "Blowing Fresh" (2), by Mr. David Green, are two excellent drawings to commence the list with. The characteristic of the Dudley Gallery exhibitions is that they consist too largely of works which, without any particular shortcoming, are also without any special interest; hence we naturally turn to those which emerge above this general level. Such are Miss Bernard's broadly-treated view of "Hayle" (147), Mr. Geo. Marks's "Evening Glow" (220), "Autumn" (294), and "Heather" (298), the last a beautiful little work. Mr. Sylvester Stannard's numerous drawings, including one very large one, are all good in a way, but it is in a mannered way, and not real nature. Miss Agnes Rudd's two little sketches at Walberswick and Blackeney (218, 219) are very slight, but they show a feeling for colour. Among other things to be mentioned are Mr. Walter Severn's "Gorse in Full Bloom" (200); Mr. Duassut's little miniature study of "A Cottage Garden in Kent" (193); Mr. Wells's Dartmoor views; Mr. Standen's "Borghetto, near Bordighera" (88); Mr. S. G. W. Roscoe's "Cottages, Landewednack" (116) and "Gorse in Bloom" (176), a real bit of light and colour; Mr. Vivian Rolt's "Lane near Crooked Common" (248), showing a very good water-colour style; Mr. A. Meyrick's "Study of a Herringboat" (252) and "Eyemouth Harbour" (170)—Mr. Meyrick paints ships well; and Mr. Tyndale's "Holton, near Oxford" (98), a small, carefully-executed view of a roadside house and trees.

The Holland Fine Art Gallery.

At this gallery there is on view a collection of pictures, chiefly landscapes and sea-pieces, by Mr. Charles P. Gruppe, an artist who is an American by birth, but is now working in Holland, and who has assimilated the style of the modern Dutch school as completely as if he had been a native of the country. Mr. Gruppe is an artist of no mean powers; all his paintings show a broad and artistic style and feeling, and some of them are very beautiful. We may mention especially a beach scene, "Bringing up a Herring Fisher" (37), which is admirable in tone and atmosphere, and only needed a little more decisive and detailed treatment of the ship to have been a perfect work; "Evening near Laren" (24), with the faint evening light on the horizon; "Gathering Wood" (36); "A Corner in Laren" (8), a delightful little roadside picture; and "A Fresh Day, Katwyk" (4), a seapiece with a very fine sky. One or two of the others recall Jacob Maris, and are not far behind him.

The Fine Art Society.

THE collection of water-colour drawings of Surrey, Sussex, Hants, and Wilts, by Mr. Wilfrid Ball, on view at the Fine Art Society's Gallery, is enough to make a reputation. We have seldom seen an exhibition of the works of one artist in which there was such a uniform level of excellence. These are landscapes in a delicate and finished style, yet preserving breadth. There are two indeed —"Now came still evening on" (57) and the large one entitled "A Surrey Common" (71)—which are in a different manner from the rest, as if the artist had been trying an experiment; and we do not like them so well as the others. But in the main this is a beautiful set of pictures of English landscapes. Among those that seem exceptionally where all are good, we may mention "Haytime in Surrey" (7); "Shackleford Common" (20); "The Village of Fittleworth" (23); and "Hurrying Clouds" (58). At the same gallery is an exhibition of drawings of English and Italian gardens by a lady artist whose name is new to us —Miss Ina Clogstoun—and whose drawings are an agreeable surprise. They are in a broader and fuller style of execution to Mr. Elgood's, and have not the same minute finish of detail, but in their own way they are perhaps equal to his as far as the flowers go. Miss Clogstoun does not, however, put in architecture as carefully and conscientiously as Mr. Elgood. But her drawings contain much exceedingly fine work as representations of the colour and character of flowers, and give her at once a position as an artist in this class of subject.

ADDITIONS AND ALTERATIONS TO TOWN HALL, SUNDERLAND.

THIRTY designs have been sent in for this competition, which, being an addition sandwiched between two important buildings, restricted the competitors, more or less, to a repetition of design, and turned the question into competitive planning. The sum allowed, exclusive of internal decoration, was 30,000*l.* Mr. Macvicar Anderson was the assessor.

The first premium has been won by Messrs. Wills and Anderson, with a scheme well ahead of the others in its solution of the problem. This is the only design in which the authors have realised the value of transferring the present entrance to a central position in the completed block. By clearing away the present entrance hall and staircase and introducing a large hall running with the long axis of the building, and having a staircase at either end, the scheme at once shapes into a symmetrical and cohesive whole, with two main galleries lighted by a continuous range in the crown of the vault. In the basement is accommodation for the education committee for truants, medical officer's laboratory, stores, and strong rooms. On the ground floor the borough engineer's offices are placed in the Fawcett-street front, and in the same front is a rather cramped cemeteries department, in which the present entrance is utilised. Facing the back are the medical officer's and electric light departments. On the first floor the front is occupied by the town clerk, committee-rooms, and the end of the reception hall, which has been transferred from its present position to the extreme north of the addition. The back accommodates the educational department. The reception-room is lighted at both ends and top, and the committee-rooms are conveniently placed *en suite*. On the second floor are sundry offices unclassified. Lavatories and water-closets are provided on each floor.

Externally, the addition is a repetition of the old work, and the whole is centralised by the introduction of another small tower, similar to the existing one, the new entrance being between the two. It is questionable whether the two towers are successful, and a more economical and dignified result could be got by transferring the present tower bodily to the centre over the new entrance. The feature of the design is the great central hall, shown (by a fine wash drawing) to be a dignified marble design of restraint and beauty.

The second premiated design, by Messrs. R. Hemingway and A. W. Bradshaw, of Nottingham, is based on an idea resembling that of the winners, but loses by using the central part for the cemeteries department, introducing a lighting area to the north. The retention of the old entrance, now obviously in the wrong place, is also a serious defect. The borough surveyor's and electric lighting departments are accommodated as in the first; but the drawing office of the latter is badly lighted from a very small area. The reception-room is placed to the front, and destroys the directness of the first floor plan. The lavatories and water-closets are inconveniently placed in the basement. The committee-rooms are badly arranged. A treatment of repetition is observed in the external design grouped as a main feature.

Messrs. S. G. Goss and Harold Burgess have been placed third, with a design scarcely worthy of its place. The present entrance is retained, and an extra one put in the new addition, leading to a badly-planned staircase. There is one main corridor. The general offices of both the borough surveyor and electric light departments are in the heart of the building, with very little light from small areas and glass screens. On the first floor the reception-room is placed on the north, and the committee-rooms are conveniently placed. The education department, to the back, is indifferently planned. Altogether the plan looks confused. Externally, the old work is repeated, but the new flanking feature fails in its purpose by being 13 ft.

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narrower than its fellow. A very fine perspective, by a well-known hand, does not betray this fact, and is the only valuable drawing in the set. The internal detail is not satisfactory.

Next to this is a design by Mr. S. B. Russell, with an additional entrance and staircase. The surveyor's and electric light departments are not well planned, the drawing office of the latter is absurdly small, and a great deal of valuable space is absorbed by very large strong-rooms. The first floor has two main corridors, and is excellently arranged. Externally, the author has ignored the existing buildings and submitted a characteristic but unsuitable front.

Messrs. Hall and Phillips have tacked the new part to the old with indifferent success and made little or no attempt to pull them together. The elevation is designed independently, and is out of harmony.

Mr. F. E. Coates works out the problem much on the same basis, with an even less satisfactory result. This is one of the few schemes retaining the reception hall in its present position, and two ways are timidly suggested to get over the difficulty of communication between the old and new parts.

Messrs. W. and F. R. Milburn provide an extra entrance, and place the borough surveyor to the back, and electric lighting to the front. The reception hall is an unshapely room, with a huge gallery, and clearstory lighting. The design is elaborate without breadth. The authors submit an alternate design for the exterior, which is the more suitable.

Messrs. Vaux and Marks' strainers are a confusion of delicate drawing and colour with little meaning, unsuitable for a competition.

Many of the competitors have failed to realise the necessity of direct communication between the old and the new parts of the building and the proportions necessary to insure the effective lighting of the rooms.

Messrs. Cackett and Burns Dick submit the only design with a full second story to Fawcett-street, which is treated with considerable success.

Messrs. Brown and Spain have sent in two designs. The design marked No. 30 is deficient in lighting to the electric light general office, and the elevation is designed to harmonise with the adjoining building to the north of the addition, with which it has no relation. Design No. 8 is a better plan, with weakness in the somewhat scattered education department and inconvenient placing of the committee-rooms. The elevation harmonises with the present hall, and we think the design somewhat hardly treated in not being premiated.

Mr. J. A. Watson, with an indifferent plan, preserves the present building intact, and submits an interesting but unsuitable elevation, shown by a really fine perspective.

VIEWS OF ST. JAMES'S PARK AND AROUND.

MR. C. E. JERNINGHAM has lent for exhibition in the City Hall, Westminster, until the evening of next Wednesday, his interesting collection of maps and views of St. James's Park and the neighbourhood. Amongst the ground-plans is a copy of Ogilby's survey of old Westminster, showing, on the north side of the Artillery Ground, "The New Chapel," to the building of which Laud contributed 1,000*l.*, together with some curious old glass. In the Rebellion Sir Robert Harley shattered all the windows, and Cromwell's troopers stabled their horses within the building. The church was rebuilt, after Poynter's designs, in 1842-3, and is now called Christ Church. Sir William Waller, the famous Parliamentarian General, and Colonel Blood were buried in the adjoining grave-yard. There are exhibited George Vertue's accredited reproduction, 1747, of the large scale plan of Whitehall Palace, *temp.* Charles II., views of the gardens of Carlton House—formerly the "King's Garden," of (old) Buckingham, or, more correctly, Buckinghamshire House, built in 1703, after Captain Winde's designs for John Sheffield, first Duke of Normanby and of the county of Buckingham, on the site of Arlington House, and of Marlborough House, as originally designed by Wren. An uncommon set is that of the interior of St. James's Palace, in colours, one of them depicting the interior of the chapel on the occasion of the marriage (in 1734) of the Princess Royal, daughter of George II., and William, Prince of Orange. Rosamund's Pond, in the north-west angle of St. James's Park, is represented by the print after Hogarth's painting; the pond is often stated to have been the scene of the suicide of Harriet Westbrook, the first wife of Shelley; but the pond was filled up in 1770, and, as a matter of fact, she drowned herself in the reservoir formerly in the north-east corner of Green Park. Whilst not containing anything of exceptional rarity, Mr. Jerningham's collection is worthy of a visit; the prints are conveniently displayed in separate frames hung around the Council Chamber.

SEWAGE AND SHELLFISH.

THE oyster scare of last year appears to have caused some searchings of heart among the members of the London County Council, and to have induced the Main Drainage Committee, which is, of course, responsible (under the Council) for the method of sewage-treatment and sludge-disposal now in use, to instruct its officials to make a careful investigation with a view to ascertaining whether the oysters and cockles obtained from beds in the estuary of the Thames are contaminated with London sewage or not. It is well known that the sewage of the Metropolis is treated with chemicals at Barking and Crossness, and that the effluent from the tanks is discharged into the Thames without further purification, while the sludge deposited in the tanks is removed by steamers and poured into Barrow Deep, a part of the sea about twenty miles below Southend. The first examination undertaken for the Committee was that of the river water from the Mucking lightship about twenty-one miles below Crossness, to a point three and a half miles below the Nore—a total distance of about eighteen miles—with Southend rather more than half-way down. Samples were collected at low water in mid-stream and near the southern and northern shores, at points about two and a half miles apart, and showed a regular and rapid diminution in the number of bacteria from the light-ship to the sea. This is only what might have been expected. But whether samples collected at six tides in March furnish sufficient evidence to warrant the Committee's conclusion that "no danger can arise from bacterial contamination, at, or below, Southend" is another matter. The Royal Commission on sewage-disposal also made an examination of the Thames, and while the results accord in the main with those obtained by the Council, the conclusion is less dogmatic:—"These results do not support the allegation that the Kent and Essex foreshores beyond the Chapman light (about four and a half miles above Southend) are greatly contaminated by the discharge of imperfectly purified sewage into the Thames at Barking and Crossness." This appears to admit that contamination of some sort does occur in the neighbourhood of Southend. The London County Council ought not, however, to forget that there are bipeds as well as bivalves to be considered, and the question may well be asked, "What is the state of the river in the twenty-one miles from Crossness to the Mucking light-ship?" Is there no danger here from bacterial contamination? And, if there is, when will the Council remove the danger?

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE BACTERIAL DISPOSAL OF SEWAGE FROM ISOLATED BUILDINGS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday evening at 9, Conduit-street, W.; the President (Mr. Aston Webb, R.A.) in the chair.

The minutes having been taken as read, Professor Frank Clowes, D.Sc., read a paper on "The Bacterial Disposal of Sewage from Isolated Buildings," of which the following is an abstract:—

The paper dealt mainly with the application of the biological method of treatment to the sewage from the new colony established at Horsham in the buildings of Christ's Hospital, erected by Messrs. Aston Webb, R.A., and Ingress Bell. The system adopted consists in passing the sewage slowly through a depositing, or so-called "septic," tank, and allowing the outflow from this tank to be dealt with intermittently in coke-beds. The effluent from the tank, after having been treated once in the coke-bed, passes into a running brook, flowing as a matter of convenience over a short stretch of grass-land on its way.

Describing the system of biological treatment and the method of adapting it, the author explained that the general advantages secured by the system are that it affords an inoffensive and non-putrescible effluent, and at the same time largely reduces the amount of sediment or "sludge" from town sewage which has to be disposed of; in the case of domestic sewage it even removes the sludge altogether.

There are two recognised methods which expose the sewage liquid for the action of aërobic bacteria. The "continuous method" provides for the liquid which overflows from the septic tank being continuously sprayed over the coke-beds, through which it constantly trickles and then flows away; whilst the "intermittent method" provides for the coke-bed being filled with the liquid and then drained away after it has remained in the bed for a few hours. Both methods, properly arranged and worked, yield a perfectly satisfactory effluent, and one or other should be chosen according to the conditions under which the sewage is to be purified; where the fall of ground is sufficient the continuous treatment might probably have the preference.

The plant for continuous treatment would be more expensive than that for intermittent, but the cost of working would be less. The extra cost of working the valves in the intermittent system may be reduced where there is a man about the place engaged in other work who can attend to the valves; or the action may be made automatic.

Summarising the general results obtained, the author stated that the treatment has now been in operation at Horsham for over eighteen months, and that not a hitch has occurred in the working of the plant. The solid fæcal matter of the sewage is absolutely disposed of in the septic tank, and no deposit has formed upon the bottom of the tank. The fear expressed that this tank might become offensive has been proved groundless, since the ventilators in the roof of the tank and the open manholes emit no offensive smell, and the smell of the effluent itself is slight and only noticeable in the immediate vicinity of the tank. The final effluent liquid from the coke-bed is usually slightly turbid, but is free from any offensive odour; it possesses only the smell of freshly turned garden mould, and this is the odour usually emitted from wholesome effluents.

An effluent of the character of that at Horsham actually improves the condition of the water of a brook which has been fouled by sewage and cesspool discharges. The experience obtained in the construction and working of the plant in question has given assurance that it is suitable to deal with the sewage derived from any isolated building without giving offence. Under proper management, the sewage effluent which it discharges is innocuous to fish, and can never become offensive when it is discharged into a water-course.

The author gave details of the construction of the plant and the method of using it. The sewage flows by gravitation into a small receiving chamber and passes through a coarse screen into the septic tank. The tank is constructed in duplicate in case of accident or necessity of repair, each part being capable of retaining a twenty-four hours' flow of sewage. The tanks are covered in and provided with tall vertical ventilating shafts similar to those employed for the ventilation of sewers. The tanks were formed by excavating the soil, and were then built in brick and rendered inside with cement. Both the inlets and the outlets of the tanks consist of elbow pipes, the ends of which are beneath the surface of the liquid within. The solid fæcal matter rises to the surface of the liquid, and the arrangement of the elbow pipes not only insures that this matter shall remain in the tank during its dissipation as gas and liquid, but also that it shall not be disturbed meanwhile by the flow of the liquid.

The effluent passes from the septic tank by an exit and flows along an open channel on its way to the coke-beds. This channel was constructed in a succession of steps, so that the liquid, by falling over weir-walls, might be freed from much of its dissolved gas and might become aërated. Aëration has since been more fully secured by letting the effluent fall through perforated trays before passing over the weirs.

From the culvert the liquid flows into a tank filled with small graded hard coke. The liquid is distributed over the coke surface by flowing along branched "grips," which are

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excavated in the surface of the coke. The grips are lined with fine coke, which serves to filter off the coarser particles and to prevent them from getting into the bed. This fine coke is raked off at intervals and replaced by similar fresh material. As soon as the coke-bed is full to the upper surface of the coke, the flowing liquid is diverted into another similar bed. The bed is then allowed to stand full for two hours, after which the liquid contents are allowed to flow away through drainage arrangements provided on the floor of the tank. This liquid constitutes the purified sewage effluent.

The tanks for containing the coke are constructed in a similar way to the septic tank, but are not covered in. They have square drainage channels provided in their floors, which are covered with perforated iron plates. Six of these coke-beds are provided, and they are used in succession. Three of them are filled and emptied each day, the liquid remaining in the bed for two hours, and the bed being allowed to stand with air in the interspaces of the coke after its liquid contents have been discharged. Two of the remaining beds receive the effluent flowing continuously through them from 5.30 p.m. to 6.30 a.m., a period during which the sewage is scarcely foul and comparatively little purification is necessary. This flow is provided in order to maintain the proper bacterial condition of the coke while the bed is not doing duty.

It is found that the amount of purification produced by a new plant increases for a considerable period, and that, so far from the tanks requiring renewal or cleansing, they become increasingly efficient as their age increases if they are worked with regularity and are left undisturbed.

This "natural" or "biological" process is identical with that which occurs in the treatment of sewage on the land in sewage farms, but the biological plant causes no offence, and requires less space and is more satisfactorily under control than the sewage farm. It compares favourably with the chemical processes of treatment, which can never effect economically a purification equal in degree to that secured by biological action, and which produce a much larger amount of sediment or "sludge."

Dr. Fowler (Manchester) said he was pleased to have been asked by Dr. Clowes, and subsequently by the President, to be present. He had a small part in the initial stages of the installation at Horsham, and it was very satisfactory to know that it was going on so well. There were a number of points he thought of speaking about in connexion with small installations which might perhaps be of interest to architects, and first of all it occurred to him that architects were singularly fortunate people in that to them in a large majority of cases—it might seem paradoxical to say so—the sewage problem did not exist. The reason was that the sewage problem had come to be more and more a question of cost. There was no doubt whatever that by modern methods it was possible to produce an effluent of any degree of purity up to potable water if necessary. He knew an installation which was being started now in the vicinity of St. Petersburg at a small town where the Tsar was accustomed to go for his summer holidays, and where an outbreak of typhoid made the inhabitants exceedingly anxious that the sewage should be thoroughly purified. He understood that they contemplated an installation there something like the one at Horsham, but there was also to be disinfection by ozone; so that where money did not much matter they could do what they pleased. There was no doubt that installations for country houses and comparatively small places such as architects were frequently called upon to deal with might be made very efficient without any very serious question of cost arising, for the reason that the addition of a few pounds to the cost of the installation might nearly double the factor of safety. He would say that generally it was well to have the largest factor of safety within limits that they could. Dr. Clowes had very properly emphasised certain limits which did exist, more especially in the size of the septic tank. He thought there could be no doubt whatever that it was possible to have what might be called over-septicised sewage. There was a case in point in the last report from Massachusetts on the Andover system. The septic tank experiments, reported upon for several years, had now been discontinued because it was proved that sewage which had travelled a long way in the sewer and remained in the septic tank had become over septicised and putrid, and was in consequence very difficult to purify. He had had a similar case under his own observation in some works which were laid down for a considerable district. But the sewage was admitted to the tanks when only a small portion of the district had been connected up, and the whole of the tanks were filled, as there was some apprehension as to whether the walls in their green state would stand. The flow was very slow, and had become a nuisance, which was undoubtedly because the sewage was passing slowly through the tanks, and there was a development of sulphuretted hydrogen. They would see, therefore, that there was a limit to the size of the septic tank, and it was possible —although not so likely—that there might be some limit to the size of the beds. He had known a case in Manchester where they had started a bed a few months, and then, owing to construction work, they had to stop it for several months, and they found that it was practically a new bed when they started again; but he did not think that would occur in the ordinary way if the bed had had time thoroughly to mature. That, however, was a moot point. It was well to have a good margin, such as was the case at Horsham, where they had only perhaps to fill the beds once a day. A little case came under his notice which might be interesting with regard to a country house where he was asked in a friendly way to look over the plans, and where he took care that there was this factor of safety. He wrote to the owner of the house the other day and asked him how the installation was getting on. The owner had had three years' experience, and he said that the effluent all that time had passed to a little pond near the public road and there had been no complaint whatever. The only difficulty that gentleman had had was with a certain amount of scum which got into the exit pipe of the tank, but that was easily removed. The owner wrote once in great anxiety thinking that his tank was completely filled up with solid matter, and he (the speaker) suggested that what was the matter was that the solids had floated to the top and formed the scum under which very vigorous bacterial action was going on. The owner investigated and found that this was the case, and removed the scum and found everything right. That was practically all that had had to be done to the tank in three years, and the effluent from it passed on to one or two cinder beds that were only a few cube yards in size. In this case, as it would otherwise involve a certain amount of complication, it seemed better that it should be allowed to trickle continuously through, and this was done with an ordinary little perforated zinc tray. All that was done was that the gardener went down and turned the flow from one side to another, and, having allowed a plentiful margin of cubic space in proportion to the amount to be dealt with, there was no difficulty in the purification. The whole difficulty came in when, as in the case of a great city like Manchester, they had to get the utmost out of every cube yard of space; then they had very carefully to consider the question of cost right through; but any little difficulties of distribution or anything of that sort were all neutralised, it seemed to him, if they had a plentiful margin of safety, and in most cases that could be readily allowed for in small installations at a comparatively insignificant cost. Of course, in the case of a country house, an extra 5*l.* might add, perhaps, 25 per cent. to the cost of the whole installation, and if they came to work that out for a big town it ran into hundreds of thousands, and that was where the difference came in. Then, as regarded the cost of the installations generally, that was a matter which would vary according to the conditions, and, as Dr. Clowes very rightly said, whether they should have intermittent methods or continuous methods was very largely a question of conditions—of the fall available and so forth. He believed himself, especially where they could have these margins, that the very simplest methods were always the best, and they could get quite as efficient results by some simple methods of distribution. For instance, they could have the method, as Dr. Clowes had pointed out that night, of just allowing the sewage to trickle through a certain amount of fine material on the surface as had been done at Friern Barnet for years. Methods of that sort gave quite as good results, and were liable, if possible, to less accidental interference than more complicated mechanism. That was his own feeling, and it was a conclusion which had been come to by Professor Dunbar at the Hygienic Institution at Hamburg, who had done some of the best Continental work on this subject and with whom he had had a great deal of correspondence. The form of filter which was recommended for small installations was made up of about 6 in. to 9 in. of fine material on the top with a rough, coarse material underneath, and the fine material gave them two things—it gave them distribution and it gave them what had come to be known as absorption; that was the action of the medium which was not often referred to in English literature on the subject, but it was a subject undoubtedly of great importance. There was no doubt that the physical effect of the medium was of great importance, and that was where the question of size was always to be considered. It was possible, by taking absolutely sterile clinkers of a certain size and passing sewage through, to get very considerable purification. They knew that dyes and so on would be taken right out of solution by purely physical absorption, and that matters like peptones and albuminoids were taken out purely by the absorptive action of the medium. That very soon ceased unless the biological action succeeded, and then the absorbed matter was oxidised by the action of the bacteria. This oxidising effect was of very great importance in connexion with the treatment of isolation hospitals, and that was a point which would probably be of interest to the meeting. The difficulty often arose as to what was to be done with sewage which was specifically infected by typhoid or any other infectious disease. Of course, the mere passing through the beds, as had been abundantly proved, was no real safeguard as regarded the removal of pathogenic organisms, but it had been found that it was possible to absolutely sterilise such sewage before putting it on the beds by means of chloride of lime, and after such sterilisation it could be put on bacteria beds, the chloride of lime was oxidised to chlorate, and the purification went on, if possible, more vigorously. If chloride of lime was used according to the Hamburg experience, it was possible to sterilise the sewage and free it from danger before putting it on the contact beds, and for such work they preferred the simple form of percolating bed he had described—viz., first a fine layer, after passing through which the water percolated through the coarse material and got thoroughly oxidised. He was told by Dr. Dunbar that about 50 per cent. of the change took place in the top layer. He believed that the right use of fine material on the top would help in many cases towards a very simple solution of many small sewage problems. He knew himself of a small works near Manchester, which was made of a sand top with coarse material underneath, which had been going on with excellent results for thirteen years, with regard to which only an occasional scraping of the sand had been required. Such a method as that seemed to him to be excellently suited for a small installation. In Manchester they had these grips at the top of the beds, and removed a large amount of sludge from time to time, which was simply distributed, and did not cause any sort of nuisance at all, and the labour in doing that was not really very excessive. He had had some costs got out, and, up to the present, for the whole year the cost had come out very well. They found that it came out at a cost of about 3*s.* per million gallons. Of course such figures were only of use if used judiciously. What could be done in a huge town with millions of gallons could not be done with small installations; but still the labour involved in the occasional scraping of beds in small installations was not excessive. The cost of construction again varied according to the necessities of the case. One heard all sorts of estimates of one kind and another, but he might say that their little experimental septic tank installation in Manchester for about 20,000 gallons cost them, everything included, something under 600*l.*, but he had heard of installations which had cost a great deal more. It all depended upon a variety of local conditions, which had always to be taken into account.

Mr. Harold Griffiths said there was no doubt that the methods of sewage disposal which did very well thirty years ago were quite out of date at the present time, and he was delighted to think that the Institute had had a paper of so practical a nature, dealing with so important a subject as the scientific disposal of sewage, by Dr. Clowes. It might be thought by some, and by what he might term the "shining lights"

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of the profession, that the disposal of sewage was utterly beneath their notice, but he ventured to suggest that everything which affected the complete construction of a building should come within the scope of the architect. There were one or two points in regard to which he would like, for the benefit of himself and perhaps others, to have a little additional information. The question of cost had been mentioned several times. He would like to say that at present he was laying down a sewage installation as described that night for a Surrey mansion. The difficulty he had there was that when the family were in occupation there was a considerable amount of sewage, but when the staff only were there only about one-tenth of the sewage had to be dealt with, and it made it difficult to fix on the proportions of the septic tank and the bacteria beds. As regarded cost, he considered that with a house which had approximately fifty rooms, and housed about sixty or seventy people, the cost would be about 130*l*. That was a small sum, but the amount of sewage to be dealt with was small. He would like Dr. Clowes to tell them how long the sewage should remain in the septic tank before it flowed to the bacteria or filter chamber. It had been said that if it remained very long it got too putrid, but there must be a time before proper chemical action had taken place. Therefore, it would be very valuable if precise time were given, so that they should know how long to allow it to remain in the tank before allowing it to go on to the bacteria beds. Coke had been mentioned as the best filling material, but he would like to know Dr. Clowes's opinion as to ballast. The next point was the size of the filling material. He heard, with some astonishment, from Dr. Fowler that sand on the top was a very great advantage. If that was so he would be delighted to use it, but it was the first time he had heard of it. Further, he would like to know whether it was necessary to repeat the process twice in a day, and, if so, at what time it should be done. Where there was little sewage for disposal, how many days could they go from one irrigation to another without destroying the colony of bacteria in the chamber? It appeared to him that the bacteria must be nourished, and he would like to know as to what length of time, or how frequently, one would have to repeat the process of keeping the bacteria alive in the chamber. Then what became of the grease for the washing up? It seemed that it was proposed to run the grease into the chamber in the ordinary way, and he wished to know whether that would be purified, or whether it would clog the filling material in the chamber. He would, if he might venture, suggest that for a small scheme a perforated trough of oak would be better than the method adopted at Horsham for distributing the sewage. It appeared to him that the sewage would immediately commence to sink at the end of the chamber where it entered, but if the perforated trough was adopted it would distribute the sewage all over the chamber, and it would be filled at one and the same time. Did he also understand correctly that two hours was the proper time mentioned for the sewage to remain in the bacteria chamber? He always understood that the time was four hours.

Mr. F. J. Willis (Secretary of the Royal Commission on Sewage), who was invited to take part in the discussion, said he was afraid he could say little about the matter that night. He had been much interested in Dr. Clowes's paper, because it was from such men as Dr. Clowes that the Royal Commission had to get their experience. There were, however, a great many problems which were not yet decided, and it was an advantage to have a discussion of that kind.

Mr. Langton Cole remarked that there had hardly be any mention of automatic action, and he would like to know whether, in dealing with the sewage of an ordinary-sized country house, it was a desirable thing to go in for one or another of the automatic arrangements which were brought before them. The question of stagnation also applied particularly in the case of a country house. What was the best method of getting over the real difficulty of a house being occupied only for a portion of the year? Was it well to leave the bed to itself, or should some special arrangement be made for dealing with it?

Mr. Penfold observed that as a country member he had come to the meeting to get some information. He was preparing a scheme for the sewage disposal of a small infectious hospital, where they proposed to have an automatic system, not intermittent; but he was rather surprised to hear Dr. Fowler remark that he was doubtful if that effluent was quite safe and that chloride of lime should be used before the sewage passed into the beds. He would like to know how Dr. Fowler would apply the chloride of lime before the sewage passed into the septic tank.

Dr. Armstrong thought that both the President and himself viewed Dr. Clowes's appearance with considerable satisfaction, because they were primarily responsible for the adoption of this system at Horsham. He, as one of the Governors of the school, very carefully considered the question, and it was a very difficult problem to deal with. Personally, after various visits under Dr. Clowes's superintendence, he had little doubt as to the desirability of adopting the system, but, although he had never before ventured to hint at such a thing, he felt that the President was a little nervous at the time, and therefore it was a great satisfaction to know that the scheme did work successfully. He thought that was a proper time to tender Dr. Clowes their most grateful thanks for the assistance he had rendered them. From the scientific point of view this system of sewage disposal was one of extreme interest. In the first place it was a justification of the cesspool system. They got rid of the old cesspool and thought it was an abomination, but they were coming back to it, only on a larger scale, with the precaution that they did not draw immediately on the tank for their water supply. That really was the only distinction between the modern and the old system. In the old system the well and the cesspool were placed side by side. Now they were careful to avoid placing the well near the cesspool, although perhaps Dr. Fowler had foreshadowed that they might be prepared to drink sewage properly purified by a system. When they considered what was going on in these tanks it was extraordinarily interesting. It showed the difficulties which the architect laboured under in these times when he was called upon to be a master of all trades, but in the second place it did emphasise the importance of an architect receiving a thorough grounding in scientific subjects and a proper training in scientific knowledge. He did not know that he had anything to say with regard to the technical side of the problem. He thought, however, that many would like to visit the installation at Horsham, which had been carried out with that elegance of design which was characteristic of Mr. Aston Webb. It might perhaps be a trifle expensive, but he believed in the long run it would be agreed that the money had been spent to the greatest possible advantage.

Mr. Osborne Smith seconded the vote of thanks, and, in doing so, said that he would be glad if Dr. Clowes would supplement his remarks in telling them a little more how the laundry refuse was to be dealt with, for the washing for a thousand boys must be considerable. He would like to know whether it was turned on to the beds with the rest of the sewage, or whether it was treated separately. There was another difficulty sometimes encountered by some of them who had to do with houses in the country, which was that sometimes the beds had to be put in such a position that they had to be covered. He would like to know what the exact effect of the covering of beds was, because he believed in some cases it had a disastrous effect.

Mr. King asked what was the reason for the tanks at Horsham being ventilated. Up in the north he had done two similar installations and they did not ventilate, and they had only about 4 in. of crust on the top. They understood that that crust was composed of cannibals eating each other, and so getting rid of the solid matter.

Mr. Max Clarke said that he had put up a small bacteria tank in 1893, but, unfortunately, at that time he did not know anything about the secondary or coke beds, so he allowed the effluent to run from the tank along a trench cut in the ground, and that had been going on with very successful results. The installation was for a small house, with accommodation for about six persons. He was conversing with a man last year who told him that he had just come from inspecting a very large installation of this nature for a public institution, and he said that the scum had grown right up through the drains and the soil pipe with such disastrous results that the whole system was blocked up. He had been unable since to find out anything more relating to this particular catastrophe, but he would like to know whether anything of the kind had come within the knowledge of Dr. Clowes.

A gentleman in the body of the hall asked what should be done in the case of a perfectly level site where they could not get a fall.

Mr. F. Lishman said that a thing which had occurred to him when looking at the illustrations was what would happen in the case of frost. He had seen the effluent spread over these beds, and he had felt a little uneasy in case of frost. They must remember that in recent years, since this system had become somewhat common, they had had no frosts at all of any severity. Supposing they had frosts of three, four, or five weeks' duration, which was the case in 1891 and 1892, what would happen in the case of the Horsham School installation, or in other places?

The Chairman thought they would all agree that they had spent a most useful and instructive evening. He agreed with what was said that they as architects should certainly keep up with the science of the disposal of sewage, as much as any other part of their elaborate work. As Dr. Armstrong had said, he, as one of the Governors of Christ's Hospital, had a great deal to do with the system adopted at Horsham, and it was also at Dr. Armstrong's suggestion that they were fortunate enough to get the help of Dr. Clowes in carrying it out, and it was through Dr. Clowes that they were again fortunate to have further help given by Dr. Fowler, of Manchester. He felt that he was under great obligations to those three gentlemen in that particular matter. He felt that he ought rather to apologise that for a second evening this particular school at Horsham had been under discussion; but when he found that Dr. Clowes was willing to give them a description of the work which he had done there, he thought he would not have been doing the Institute a good turn if he had not encouraged him in giving his paper. Down at Horsham they had rather a difficult task, because the nature of the land there was not very suitable for the disposal of sewage over the land. Horsham itself had tried that principle, and, in fact, had a sewage farm not very far off, and it became essential that any effluent which was passed from this particular congregation of individuals, which numbered over a thousand, should be as pure as it could be made, or, undoubtedly, the Institution would have got into serious trouble. It was, he thought, a test of its success that for eighteen months that effluent had been passing away, without annoyance to anyone who resided in the district. Before it was decided upon Dr. Clowes took him down the river to Barking, and certainly the effluent he saw there pouring in tons into the Thames was a very different effluent to that discharged from the sewage which had been treated on the methods described by Dr. Clowes. He had had the advantage some time ago of hearing Dr. Clowes speak on a similar subject at the Royal Institution, and he said then with reference to these bacteria—which he supposed he might say even Dr. Clowes did not know all about—that they could be exposed to an extraordinary amount of heat without affecting their vitality in any way, but that when they were exposed to the sun they turned up their feet and died. That struck him as a wonderful example of the beneficent use of the sun's rays. It was one of the principles they had gone on at Horsham, viz., to call the sun in in every possible way to preserve the health and strength of the boys who occupied that place. With regard to the bacteria, although he knew the installation at Horsham very well, he confessed that he could not recognise any signs of the presence of those bac eria which had been shown on the screen. Dr. Clowes weighed them and told them how many there were to the inch, but he was not at all sure that they always thoroughly well understood what exactly took place with regard to these organisms. With regard to installation to private houses, which, as Dr. Fowler had told them, affected architects very largely, he had found the same difficulty arising from the unequal flow in these small installations. In one case he had an automatic system which was supposed to throw the matter first on one bed and then on the other when the first was filled. That worked very well up to a certain point, but when the house was full of visitors,

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an l an extra number of baths, etc., were required, an l an extra amount of water had to be dealt with, the automatic system was no good at all. Whether that could be improved or not he did not know, but it was certainly one of the things they must look to for assistance from gentleman like Dr. Clowes and Dr. Fowler. He would like to say how very much indebted they, as architects, must always be to scientific men who were good enough to take an interest in these matters. We (architects) could not pretend to originate these things, and all we could do was to carry out, to the best of our ability, the suggestions which those gentlemen gave to us. As architects we did not profess to be experts in these matters, and he thought every wise architect would call in a man who was experienced in such matters before putting his client to an expense in regard to the disposal of sewage. In conclusion, the President said he was sure they would include in the vote of thanks Dr. Fowler and Dr. Armstrong.

The vote of thanks having been heartily agreed to,

Dr. Clowes, in reply, said that he had had no experience with regard to automatic arrangements, and perhaps Dr. Fowler might answer th it question first.

Dr. Fowler said it was a somewhat delicate q iestion on which to speak publicly, because t iere were a great number of these automatic apparatus, and each one of them, of course, h id some special feature, so that all he could say w is of a general character, and rather to the e ect that the use of automatic gear—the e onomic use of it—depended upon the amount o labour they could save. If they could save p actically all their labour, and could dispense w th men entirely, they would of course save 1 0 per cent., but when the installation got bigger and bigger, and they were bound to have a number of men about, then he was bound to s y from his experience in Manchester that the u e of automatic gear became less and less. He h d a great wish to see everything done as n arly as possible by machinery, but when one found that one man could control a large number of pipes one began to think the game was hardly worth the candle. The question was not really the acreage they had to control, but it was the flow they had to control at a given moment. They had in Manchester seventy-two acres to look after, but they had only got one million gallons per hour, and one or two men could very easily distribute that amount of water about the place by means of sluices. It was not as if the whole 26 million gallons came in at once. At the early stages of the Manchester scheme there was talk about them wanting a thousand men, but they had found that only a certain amount of water came down in a given time, and if they had supplied all the beds with expensive machinery they would have had a very large proportion of the plant simply lying idle for the greater part of the time. What they had to consider in all these cases was the really economic course to pursue, but he was sure that any automatic gear adopted must be of the very simplest. It was possible to devise highly ingenious arrangements of syphons and pipes, and so on, which would act exceedingly well in putting clear water from one tank to another, but with sewage it was a different thing. Sewage produced growths in the pipes through which it flowed when there was no access to the air. No one without experience could realise what it could do. He had seen pipes of three inches diameter through which sewage had flowed which had become completely blocked with fungus.

The President: That would account for the case mentioned by Mr. Max Clarke?

Dr. Fowler said it was quite conceivable that the case mentioned by Mr. Max Clarke was due to the sewage flowing through the pipes where there was no access for air. Any automatic gear if adopted should be free from small pipes or anything of that kind which could get out of order. It should be something of the very simplest—a mere tipping bucket, or something of that kind.

Dr. Clowes said that he would first try to deal with the question asked as to providing for a regularity of flow, and how to provide for the absence of a family altogether for a mansion when the sewage became reduced to a very small amount. At Horsham in the first long holiday they had sore trouble from the fact that the flow almost ceased, and they were only able to meet that by turning the water supply through the whole system. He thought that was the only way of dealing with that particular case.

Dr. Fowler suggested that in cases where there was great variation it would be possible to allow the sewage to pound up to some extent in the tank, and allow it to flow away afterwards.

Dr. Clowes said the question was asked as to the length of time the sewage should remain in the septic tank. It was unwise to allow it to remain for a longer period than twenty-four hours. Very shortly after that it began to undergo a foul change which would lead to the tank becoming a nuisance. They had had septic tanks at work for many years in London, and they gave about six or seven hours only for the passage of the sewage through the tanks. But, of course, London sewage was different from the sewage of these private houses. It had been a long time in its passage and underwent a certain amount of change in the sewers. He certainly considered that more than twenty-four hours was highly undesirable. As regarded the material for filling the bed, they found that nothing was quite so efficient as coke. Ballast had been used successfully, and clinker—the hard clinker from the boiler furnaces—broken brick, and broken "saggars," the rough clay vessels in which potters burned their clay. All those had been successfully used, but none of them with quite so good a result as coke. With regard to the spacing of the two fillings in the twenty-four hours, ideally they should be separated as widely as possible, but, as a matter of convenience it was generally found that the two fillings took place during the daytime, because it was not economical to have a man kept late into the night in order to place the second filling at its proper time. With regard to feeding the bacteria at regular intervals it was suggested that it was necessary that the bacteria should receive a supply of nutriment. It was not, however, absolutely necessary to supply them with nutriment. They had found that for a week or a fortnight the passage of pure water through the beds seemed to maintain the bacteria in condition, and that they began their efficient action directly the sewage came in afterwards. The grease would disappear entirely in the septic tank. It would rise with the other solid matters which formed the scum, and in that scum it would be dealt with efficiently by the bacteria and would often aid the change. At Horsham the grease was separately dealt with. He was told by the bailiff in charge that all the laundry water was passed through vessels filled with common flints, and the liquid which passed away did not go through the installation for the treatment of sewage, but was passed off separately. It was suggested that a perforated oak trough might be better than the grips, as the latter did not carry the liquid through the length of the bed. As a matter of fact, they found that the system at Horsham ensured the liquid being distributed without any trouble. He mentioned two hours as being allowed for the aeration of beds, and he thought that that was sufficient, but there was no objection to that period being extended to ten or twelve hours or even more. There was no doubt that the main part of the purification was carried out in half an hour—more than 50 per cent. of it; but they generally gave two or three hours, because a certain amount of purification went on during that time, but afterwards there was practically none. He did not know where covered beds would be necessary.

Mr. Osborne Smith said it might be that the site was limited, and they could only put the beds in a position where they might be noticed by their smell.

Dr. Clowes said that these beds did not smell. If there was any question of hiding them, there would be no objection to a raised cover which would be open at the edges, but the coke beds must have aeration. The sun would not have any effect, as it would not penetrate sufficiently. Dr. Fowler had referred to the stopping of the outfall, and he believed that scum would do it as well as fungus. It might very likely have happened at Horsham, but the man in charge was told every now and then to probe it to ascertain its thickness, and it it got near to the opening of the elbow pipe to divert the sewage into the other septic tank, and in that way they had never had the slightest trouble. Where an absolutely level site had to be used, pumping must be resorted to. Frost was really not troublesome. A sewage farm, of course, was frequently thrown entirely out of action by severe and long-continued frost, but sewage coming underground was always at a temperature much above freezing point, so that there was always a comparatively warm liquid coming on to the bed.

Mr. E. Pike, chemist at the northern outfall, said that in 1895 there was a thin coating of ice on the beds at Barking, but bacterial action was not interfered with.

Dr. Clowes said that the President had remarked that he was not familiar with the organisms thrown on the screen, but those he had shown were not Horsham individuals at all. It reminded him of the town councillor in a town whose water supply was criticised, and it was reported how many bacteria there were per cubic centimetre. The councillor thought it was a slander on their supply, which came from the river, and he got up at the next meeting of the Council and said he had stood the whole day on the bridge contemplating the stream and had not seen a single bacterium. Personally, he was glad to advise as to the small installation at Horsham. They had been working at the matter for some years at the London outfalls, and the results arrived at were pretty final, and they stopped their experimental work. He was much interested, too, and was glad of the opportunity of having a small plant working on the system which he could continually observe, and from which he could still learn a good many useful facts.

The Chairman announced that a special general meeting for the election of the Royal Gold medallist for the ensuing year would be held on Monday, February 29. The meeting would be followed by a business meeting for the election of members and other purposes. The following resolution would be moved on behalf of the Council—"That after December 31, 1906, every candidate for the Fellowship shall be required to have passed the examination or examinations qualifying him as an Associate; but that in exceptional circumstances the Council shall have power to dispense with such examination or examinations. Further, that during the intervening period the doors of the Fellowship shall be opened wider than at present, so that no reputable practising architect desiring to join the Institute shall be debarred from doing so." Also the Council would propose certain amendments to the suggestions for the control of public competitions.

The meeting then terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Lord Monkswell, chairman, presiding.

Loans.—On the recommendation of the Finance Committee, the following loans were agreed to:—Battersea Borough Council, 11,710*l.* and 50,234*l.*, for paving, housing, etc.; Camberwell Borough Council, 16,958*l.* for purchase of property for housing purposes; Hammersmith Borough Council, 6,760*l.* for street improvement; Lewisham Borough Council 24,000*l.*, for provision of burial ground; and Poplar Borough Council 15,030*l.* for paving and channelling works. Sanction was also given to the following proposed loans:—Hackney Borough Council 22,775*l.* for contribution to street improvement, and 500*l.* for contribution to cost of reconstruction of bridge; Islington Borough Council 1040*l.* for electric light installation; Kensington Royal Borough Council 27,098*l.* for erection of dust destructor; and Lambeth Borough Council 25,025*l.* for purchase of a site for a town hall.

Improvement: Tower Bridge Northern Approach.—The Improvements Committee recommended, and it was agreed, that the supplemental estimate of 195,000*l.* submitted by the Finance Committee be approved; and that additional expenditure on capital account, not exceeding 195,000*l.* be sanctioned in connexion with the formation of the northern approach to the Tower Bridge, authorised by the London County Council (Improvements) Act, 1897.

Factory and Workshop Act, 1901—Means of escape in case of fire from factories, workshops, etc.—The Building Act Committee reported as follows:

Under the provisions of the Factory and Workshop Act, 1901, it is the duty of the Council to see that each factory or workshop situated within the administrative county of London, in which more than 40 persons are employed, is provided with such means of escape as can reasonably be required in the circumstances of the case. On May 6, 1902, we submitted a report as to the progress that had been made in the work devolving on the Council under the Factory and Workshop Acts, 1891, 1895,

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and 1901, and we think the Council will be interested to know what progress has been made since. We therefore submit the following return showing the state of the work on December 31, 1903 :—

Cases on Council's register.		Number of cases in which means of escape have been provided to the satisfaction of the Council.		Number of cases with which the Council cannot deal by reason of not more than 40 persons being employed when the premises were first inspected, or the number having been subsequently reduced to 40 or less.	Number of cases remaining to be dealt with.	
Origin.	Number.	Old factories, etc.	New factories, etc. (certificate cases).		In hand (in various stages).	Means of escape not yet formulated, but preliminary classification and inspection made.
Cases notified by the Home Office	2,247	299	15	669	216	1,048
By notification from other sources	228	36	—	82	68	42
Voluntary proposals	154	28	—	33	93	—
Applications for certificates	451	—	194	28	229	—
	3,080	363	209	812	606	1,090
		572				

As the result of the preliminary inspection of the outstanding 1,090 cases it is found that there are :—Dangerous cases, 264 ; cases requiring early attention, 129 ; cases not immediately urgent, 107 ; cases with which the Council cannot deal owing to not more than 40 persons being employed, etc., 590.

In the period between the coming into operation of the Factory and Workshop Act, 1891, and March 31, 1901, 1818 factory, etc., cases were notified to the Council, and by the latter date 798 of them had been, or were being, dealt with. Since then we have adopted the system of having a preliminary inspection made of all cases notified to the Council, as soon as practicable after the notification has been received, and by this means any cases which do not come within the scope of the Act, and with which the Council consequently cannot deal, can be removed from the list and the most dangerous cases dealt with without delay. In the period since March, 1901 (less than three years), inquiry has been made into 2,282 cases, and disregarding the 590 cases which, for the reasons stated, do not come within the scope of the Act there remain about 500 cases with which the Council has to deal, and in which it has not yet formulated its requirements.

During the past nine months the progress that has been made is as follows :—

New factories and workshops where means of escape have been provided to the satisfaction of the Council, and in respect of which certificates have been issued	45
Old factories and workshops in which the Council's requisitions have been complied with	37
New factories and workshops—Applications for certificates	50
Old factories and workshops in which the Council has sent requisitions requiring proper means of escape to be provided	78
Proposals to comply with requisitions or deviations from proposals already submitted	219
Factories dealt with, or being dealt with, by the Council where fires have occurred during this period	13
Cases with which the Council cannot deal, by reason of not more than 40 persons being employed when premises first inspected, or the number having been subsequently reduced to 40, or below, etc.	103

It will be seen that the number of cases in which the Council's requirements have been actually completed during the past nine months is 82 (45 new and 37 old), and the number of cases taken in hand is 128 (50 new and 78 old). This gives 210 cases (*excluding* those which for various reasons were found not to come within the Council's jurisdiction) dealt with in nine months, being at the rate of 280 a year, whereas during the ten years ending March 31, 1901, the average number of cases dealt with each year (*including* those which were found not to come within the Council's jurisdiction) was about 80, so that the rate of progress has been greatly accelerated. If the present rate be maintained, it will take about five years to dispose of the cases in which the Council has not yet formulated its requirements, without taking into account the additional notifications which are constantly being made. The number of such notifications has greatly increased since the Queen Victoria-street fire, the actual number last year having been 296, and although an increasing proportion turn out to be cases which have been previously notified, or cases with which the Council cannot deal, a great deal of work is involved, as in most cases a preliminary inspection is necessary, and in some cases several inspections have to be made.

In the discharge of its duty under the Factory Acts the Council has been confronted with two serious difficulties which have had the effect of making rapid progress impossible. These are, first, that in the case where any one part of a building is not a factory or workshop within the meaning of section 14 of the Act, it is held that a requirement for the provision of means of escape from the other parts of the building would not be reasonable, and could not therefore be enforced, if to comply with it the owner would have to commit a trespass on the part of the building which is not a factory or workshop. The effect of this has been in some cases to render it impossible for the Council to require the provision of satisfactory means of escape and to seriously impede progress, as in order to determine whether a requirement will involve a question of trespass it is frequently necessary to inquire into the terms of occupation of all the different persons carrying on business in the building under consideration. Secondly, delay is caused by the fact that any person who is dissatisfied with the Council's requirements may resort to arbitration at any stage of the proceedings, as he is not bound to declare his intention to do so within a reasonable time of receiving the requirements, but only within one month after a difference of opinion between him and the Council respecting such requirements has arisen. Since no period has been specified within which a person must declare a difference of opinion, it is often only after a considerable period has elapsed that the Council is informed that it is intended to resort to arbitration, and consequently much valuable time is lost.

The following particulars as to the approximate number of persons employed in factories, etc., notified to the Council may be of interest :—

Number of persons employed in—		
Factories, etc., in which means of escape have been provided to the satisfaction of the Council—		
Old factories	58,800	
New "	35,900	
		94,700
Factories, etc., being dealt with by the Council		70,000
Factories, etc., remaining to be dealt with		70,000
Factories, etc., notified to the Council, but with which the Council cannot deal		15,300
		250,000

The total number of persons employed in all factories and workshops in London was given in the Report of the chief inspector of Factories and Workshops for the year 1898 as 499,333, and it is therefore evident that the number of factories, etc., over which no control is exercised as regards the provision of means of escape in case of fire is very great. We regret that we are not in a position to obtain more recent data as to the total number of persons employed in factories and workshops, etc., in London, as the information is not included in the Annual Reports issued by the Chief Inspector of Factories since the year 1898. We think that this information is very valuable, and we should be glad to see it inserted in future reports.

Capt. Hemphill, in presenting the report, called attention to the details given therein on the work of the Council under the Factory and Workshop Act, 1901. The work of the Council in this direction had been much expedited during the past year. From 1891 up to March 1901 only 798 factories were dealt with, but since then up to December 31, 1903, inquiries were made in 2,282 cases. That was a very rapid and satisfactory increase. Formerly factories were dealt with at the rate of eighty per annum, but now they were dealing with them at the rate of 280 per annum. It was important to call the attention of the Council to the number of factories over which they had no control. In 812 cases the Council had been unable to interfere, owing to the fact that the number of employees was less than forty. Nor could they deal with factories occupied by different firms. Further delay was caused by the fact that those dissatisfied with the Council's decision could appeal to arbitration. It was interesting to note that, according to the report of the Chief Inspector of Factories and Workshops for the year 1898, 499,333 persons of the working-class were employed in London factories, and of course since that date the number had been largely increased. For the adequate protection of these people the legislative powers of the Council were quite insufficient. He wished to acknowledge the debt of gratitude which the Committee and the Council owed to Mr. Riley and his able staff, who had worked incessantly on one of the most remarkable works done by the present Council.

The report was then adopted.

By-laws under the Public Health (London) Act, 1891.—Suggestions made by the Public Health Committee in regard to by-laws under the Public Health (London) Act, 1891, will be found on another page.

Proposed Shakespearian Memorial.—The Historical Records and Buildings Committee reported the reception of a letter from Mr. Richard Badger, of Anglesea House, Eastbourne, suggesting that some fitting and permanent memorial to Shakespeare should be erected in London, where the poet's life work was done, and offering, subject to certain conditions, to pay 500*l.*, to be used solely in the promotion and carrying out of such a scheme as the Council might approve, and further to deposit with the Council upon trust the sum of 2,000*l.* as a subscription to the cost of the memorial itself. The Committee recommended that Mr. Badger be thanked for his generous offer, and that it be referred to the committee to report as to the best method of carrying out the scheme.

Mr. Dolman, the chairman of the committee, however, asked that he might take back the recommendation, in order that it might be brought up in another form.

This was agreed to.

Housing.—The Housing of the Working Classes Committee reported as follows :—

"We have to report that Coram-buildings, Herbrand-street site, Drury-lane, will shortly be ready for occupation. The dwellings, which have been appropriated for the purpose of re-housing persons of the working classes displaced in connection with the formation of the new street from Holborn to the Strand, provide accommodation for 200 persons in fifty two-room tenements.

Flooding of Basements.—A long report was submitted by the Main Drainage Committee, recommending the expenditure of 5,000*l.* for the preparation of plans, etc., preliminary to the commencement of flood relief works. The estimated cost of the works is 737,000*l.*, to which has to be added the cost of acquisition of sites for outlets and pumping stations.

Sir J. MacDougall said he welcomed the report, which referred to works which he had been in favour of for years.

Mr. Cousins contended that the Council had not kept pace with its responsibilities, and were to blame for not going more vigorously to work and constructing the intercepting sewers which were agreed to four years ago.

Mr. Burns, M.P., said the effect of the Council's work was indicated not only by new sewers, but was to be measured by the rapidly diminishing death-rate, which was due to the superior work of the County Council main drainage.

Mr. Beachcroft said there could be no doubt that delay had occurred in the provision of intercepting sewers. They would have been constructed had not the Council agreed to construct the Rotherhithe tunnel.

Mr. Idris pointed out that it was impossible for intercepting sewers to prevent local floodings.

After some further discussion, the report was adopted, and the Council soon after adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Kensington, South.†—Buildings to abut upon the west side of Cromwell-crescent and south side of Pembroke-road, Kensington (Mr. P. E. Pilditch for Messrs. J. Barker and Co., Ltd.).—Consent.

Strand.—Two projecting signs in front of Nos. 1 to 5, Poland-street, St. James, Westminster (Mr. S. Jones for the Lacre Motor Car Company).—Refused.

Strand.—Oriel windows and projecting shop fronts at Nos. 1 and 3, Old Compton-street, to abut also upon Charing Cross-road, Strand (Mr. C. H. Worley for Mr. T. Stevens).—Refused.

Width of Way.

Kensington, North.—The retention of a studio building at the rear of No. 16, Addison-road North, Kensington, with the boundary fence at less than the prescribed distance from the centre of the roadway of Princes-place (Mr. H. Cayley for Mrs. Clarke).—Consent.

Rotherhithe.—A one-story building on the north side of Gibbons-rents, Bermondsey, with external walls at less than the prescribed distance from the centre of the roadway of the street (Messrs. F. Chambers and Son for Messrs. R. Dickeson and Co.).—Consent.

Width of Way, Lines of Frontage, and Projections.

Hammersmith.—One-story bay-windows and porches in front of Nos. 2 and 6, Paradise-row, Dalling-road, Hammersmith (Mr. W. J. Burns).—Refused.

Width of Way and Construction.

Wandsworth.—Deviation from plans approved for the erection of a one-story steel shed at Gothic wharf, Brewhouse-lane, Putney, so far

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St. Clement Danes and St. Paul's: as seen from Newcastle-street during the present alterations. Drawn by Mr. A. C. Conrade.

as relates to the fixing of gable sheeting to such shed, and to the placing of lettering on such gables and on the side of the roof facing the river (Mr. A. E. Chasemore).—Consent.

Formation of Streets.

Paddington.—Retention of wooden fences or barriers across Lauderdale-road, Biddulph-road, Ashworth-road, and Delaware-road, on the Paddington estate, Sutherland-avenue, Paddington (Mr. H. A. Hunt).—Consent.

Wandsworth.—That an order be issued to Mr. H. Keen refusing to sanction the formation or laying out of new streets for carriage traffic to lead out of the south-west side of Totterdown-street, Tooting.—Refused.

Deviation from Certified Plans.

Strand.—Certain deviations from the plans certified by the District Surveyor, so far as relates to the proposed rebuilding of Nos. 7 and 8, Mason's-yard, Duke-street, St. James, Westminster (Mr. S. J. May for Messrs. Smith and Co.).—Refused.

Means of Escape at Top of High Buildings.

Holborn.—Deviation from the plan approved in respect of the means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, from the front rooms on the sixth floor of the Bedford Hotel, Nos. 83, 85, and 87, Southampton-row, Holborn, so far as relates to an alteration in the position of the doors and one step ladder (Mr. H. Walduck).—Consent.

The recommendations marked † are contrary to the expressed views of the local authority.

NEW VIEWS OF LONDON BUILDINGS.

THE clearing away of sites for various operations of street improvement in London has the effect, from time to time, of opening out temporarily new and effective views of existing architectural monuments.

The accompanying sketch, made by Mr. A. C. Conrade, shows St. Clement Danes from a new

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point of view, in consequence of the clearance made for the Holborn to Strand Improvement, and St. Paul's seen in combination with it as a distant object.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The Leeds and Yorkshire Architectural Society held a meeting on the 11th inst., when the subject of the registration of architects was discussed. Mr. W. Howard Seth-Smith gave an address in favour of registration, and he was opposed by Professor Beresford Pite. Mr. Seth-Smith, who opened the debate, contended that compulsory examination and its attendant education would raise the status of architects, and consequently the standard of architecture, and enable the public to distinguish between the qualified and unqualified practitioner. The theory that architecture was an art and therefore did not lend itself to examination he described as misleading, because neither in training nor in test could the art be divorced from the science. The art as such only existed in its application to utilitarian needs, and architects would ever be employed mainly for their practical qualifications. Herein was their only chance to express such artistic thoughts as might be inherent in them. Registration so far from disintegrating the profession, would unify it by the bonds of a common qualification and brotherhood.—Professor Pite said that architects to the public were artists, and as such could not come under an examination test. He doubted that registration and compulsory tests would raise the standard of education. Architects should be free and endeavour to cultivate high ideals and an independent standard of artistic aims and professional conduct. This would place architecture upon a much higher level than would compulsory examination. There were possible advantages in a universal examination in construction, but he thought that registration would be inimical to educational progress.—The subject was then thrown open to the meeting, and in the discussion that followed several gentlemen advocated a Registration Act, including Messrs. C. Bulmer, R. P. Oglesby, J. B. Howdill, H. E. Chapman, and A. Marshall (Otley). Mr. T. Monkman, of York, declared that his opinions in favour of registration had been strengthened by what he had heard. They could feel for the artistic standpoint from which Professor Pite spoke, but, on the other hand, they were compelled to look at the matter from the standpoint of the average architect, to whom registration appealed strongly, and the issue ought not to be decided by those who stood at the head of the profession. No matter how high his ideals may be, the architect had to descend to the level of business, and however he might try to cultivate and uplift art, he was bound to recognise that the commercial side of life entered very largely into his profession. He had to make his living, and consequently the question could not be decided without taking into consideration the views of the average architect. Registration would tend to improve both the architect's social status and ability. He would admit that it would be very difficult to institute an examination into a man's artistic qualities, but his scientific and constructive knowledge ought to be tested, and once they went so far it might be possible to do something with regard to the artistic side. They ought to debar a man from practising who had not to some extent a knowledge sufficient to entitle him to use the name of architect. In other professions men were not allowed to practise until they had shown some ability, and it seemed to him that the same argument should hold good of architecture. A compulsory examination would not prevent anyone from displaying artistic qualities and advancing as an architect in every sense of the word.—Mr. S. Kitson expressed the opinion that at present architects were not worthy of registration. They did not "hang together," nor were they educated up to registration, which, if adopted, would do harm.

MANCHESTER SOCIETY OF ARCHITECTS.—On the 11th inst. Professor Capper gave an address to the Manchester Society of Architects, in the course of which he spoke of the importance of the study of design in architecture. This, he said, was a first feature of the course of training at the Ecole des Beaux Arts in Paris, and also in all the schools of architecture in the United States. While we might look upon English architecture of the past with pride and the consciousness of splendid achievement, we could not now afford to dispense with adequate and thorough training in design, and this training should be especially the work of our university schools of architecture, such as that which had been formed at the Manchester University. To power in design all great buildings owed in chiefest measure their fame, and design should form from the earliest moment the backbone of the student's course of study. Professor Capper showed how academic training provided the best road to success, because it was the best means by which the student obtained that grasp of subject and breadth of view which were essential for the attainment of the best results. A proper academic course, he said, was not calculated either to stifle genius or to create a dead level of mediocrity, lacking the freshness of untrained spontaneity. Afterwards Professor Capper spoke appreciatively of the value of training on the practical side, but he pointed out that an office training was inevitably of a fragmentary character.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of the Sheffield Society of Architects and Surveyors was held on the 11th inst. in the Lecture Hall of the Literary and Philosophical Society, Leopold-street, Mr. T. Winder presiding. Mr. W. Gilbert (of the Bromsgrove Guild of Applied Art) gave a lecture on "Evolution of the Manufacturer in Art." The lecturer traced the origin of the guilds connected with craft from the earliest period, and referred to the beautiful work of the mediæval craftsman, when there was no division of labour, and when work was the pleasure of his existence from the time of his apprenticeship until he became full member of the craft. He also showed how great historical occurrences affected the guilds by developing art workshops and thus divorcing the artist and craftsman. The influence of Italian "commercial" artists during the Renaissance was next referred to at some length, and the various phases of craft work up to the XIXth century. The institution of classes for designing in this country was also mentioned. In 1851 there were twenty-two such classes in existence. The influence of the great exhibition in the year on craftsmanship was described by Mr. Gilbert. The conditions which alone would produce good work in art classes, he thought, were that they should not be municipal factories, competing in any way with local manufacturers, and that they should not be the home of fads, but the home of thought. The lecturer commended individualism in art. Craftsmen owed much to architects. He alluded to the fine work of the late J. D. Sedding, especially at the Holy Trinity, Chelsea, where his work was combined with the craftsmanship of Onslow Ford, Pomeroy, and others. The lecturer, in conclusion, pleaded for greater association between good workers in the production of good work, and especially between architects and the different craftsmen employed in building. A discussion followed, and on the motion of Mr. T. Swaffield Brown, seconded by Mr. Horace Wilson, and supported by Messrs. W. J. Hale, J. R. Wigfull, C. Green, E. M. Gibbs, W. C. Fenton, and W. F. Smith, a vote of thanks was accorded the lecturer.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of the Edinburgh Architectural Association held on the 10th inst. in 117, George-street—Mr. J. A. Arnott, Chairman of the Associates' section, presiding—Mr. Charles Mackie, A.R.S.A., read a paper entitled "Common-sense in Art." He dealt with art origins, the composition of colour and line, and an attempt to arrive at a more scientific basis for colourisation, illustrating colour harmony from the tradition. All true taste in colour was, he said, founded on the practice of the masters; they were the originators, and so must be the final tribunal.

ULSTER SOCIETY OF ARCHITECTS.—A general meeting of the members of this Society was held in the rooms, 16, High-street, Belfast, on the 9th inst. The President (Mr. W. J. Gilliland) occupied the chair, and the following were elected:—Mr. James Gray Lindsay as member, Mr. George Kidney as associate, and Messrs. Jas. Reid Young, David Gorman, and Thomas Macivor as students. Mr. Seaver reported on the recent Local Government Board inquiry *re* the proposed Water Commissioners' by-laws, and the action of the council in opposing their confirmation was approved. A discussion took place on the subject of certain requirements of the City Surveyor with reference to information he desired in connexion with plans. It was decided that members should decline to supply this, as they believed it would interfere seriously with the necessary freedom of the architect in the construction of his buildings, and that it was not required by any section of Act of Parliament or by-law. Recent action by some members of the Belfast Builders' Association in endeavouring to substitute rules of the Association for the conditions of contract provided by architects in tendering was considered. It was agreed that tenders must be sent in by builders in conformity with the conditions of contract provided by the architect. It was reported that improved accommodation had been obtained for the Society at 13, Lombard-street. The action of certain employees of the Belfast Corporation in preparing plans and acting as architects was discussed, and referred to a committee to deal with. It was announced that the annual exhibition of the prize drawings of the Royal Institute of British Architects would be held, by permission of the Library and Technical Instruction Committee of the Council of the County Borough, in the Art Gallery, Public Library, during the week beginning April 4, and that an examination for students of the Society for the qualification of Associate of the Royal Institute of British Architects would be held in Belfast in the month of June next, due notice of the exact date to be given.

THE GLASGOW ARCHITECTURAL ASSOCIATION.—The seventh ordinary meeting of the session was held on Wednesday, the 10th inst., Mr. W. J. Blain, President, in the chair, when a paper was read by Mr. James G. Morris on "The Planning of a Small House." The lecturer commenced by observing that a small house is primarily intended to be occupied by people who are usually very ordinary in their thoughts, and manner of life; and who, as a class, live mainly upon a more or less established system of prosaic conventionality. Within their walls will assuredly transpire those crises of all life—birth and death. Illness and nursing, with their often unexpected needs and extempore expedients, will be there, as well as the ordinary and everyday events of life, and social intercourse — modest entertainments, occasional festivities, and the rest and quiet of home life, which is the most important and enduring of all. He would like very much to impress upon his audience how imperative is the recognition of this broad human and personal element which is bound up with, and must permeate, all their work, if it was to be above the commonplace and of any real value. For, unless they had sincere sympathy, and the desire to understand and work with the spirit of life which animates the universe, and with their clients, as distinct and individual parts of this wide order of life and humanity, they would never attain to the best that was in them. Mr. Morris next commented at length on the disposition and arrangement of the various rooms and departments of the house to ensure economical and harmonious working; and urged architects, when planning, to endeavour to make their plan useful, interesting, even beautiful. Let them remember that human beings were to live in the houses which they built, and that they had aspirations higher than the merely animal need of shelter. Let them not stop at the mere practical and utilitarian achievement. Let their plan touch and maintain a higher note than was required for the stable or the byre. The intellectual man cried for much more from them than a safe and secure shelter alone. His sympathetic and imaginative faculties required understanding and response. The little community over which he presided had their needs, and rights, and privileges. Their intercommunion with one another must be considered and provided for, and to meet these and provide for them suitably and conveniently, one must have knowledge, not only of the general working of each department of the household, but also of the needs of those little contrivances for simplifying work and increasing comfort which meant so much, and which cost so little to obtain.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.—The thirty-seventh annual general meeting of the donors and subscribers will be held at the offices, 21, New Bridge-street, E.C., on Tuesday, the 23rd inst., at half-past seven p.m., to receive report and balance-sheet for the past, and to elect officers for the present year. The annual dinner will be held in the King's Hall, Holborn Restaurant, on Tuesday, April 19, Mr. F. G. Minter in the chair.

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THE SANITARY INSTITUTE:
ROAD SANITATION.

A MEETING of the Sanitary Institute was held on Wednesday last week in Parkes Museum, Margaret-street, W., Lord Monkswell, Chairman of the London County Council, presiding. The evening was devoted to a discussion on "Road Sanitation," and addresses were delivered by Mr. J. Patten Barber, M.Inst.C.E., and Dr. Louis C. Parkes.

Mr. Barber, in the course of his remarks, said that hitherto it had been scarcely necessary in country districts to take into account sanitary conditions in road-making and maintenance, for a well-made macadamised road gave a sound and lasting surface, but the increasing use of motor vehicles would necessitate, no doubt, the construction of dustless roads or the adoption of means for laying dust raised by vehicles on ordinary macadam roads. The first alternative could be provided by tar macadam which, though more costly, was freer from dust and mud; and the second by treating the road with oil or tarry matter. But in regard to town roads, sanitary requirements were very important, and this was especially the case with ordinary macadam roads, heavy traffic on which produced a great deal of dust and mud. Some few years ago he had under his charge a macadam road in Islington, along which some 500 omnibuses passed each day. Everything was done to keep the road clean and prevent offensive smells coming from it; orderlies were employed, the road was washed three times each week, and deodorising liquid was used daily during the summer; but notwithstanding this the smell was often intolerable. He mentioned this to show that, whatever care was taken, it was impossible to keep the macadamised road, exposed to heavy traffic, free from offensive smells, and such construction was unsuitable for town roads. Macadam roads would be found to be the most costly form of construction—excluding such material as flint. The cost of keeping such a road in the same state of repair as a paved road was excessive, and a macadam road, which it was necessary to coat as frequently as once or twice in two or three years, should be converted into a paved road. There were many miles of these roads in London from which large quantities of mud and dust were carried to the paved roads forming the main lines of vehicular traffic, so that if the necessary paving were done it would benefit those residing in or passing over these roads. The important work of reducing the dust in the atmosphere would be greatly assisted. The road which would find favour as the most sanitary road might be described as one formed of smooth, hard, non-absorbent material, incapable of being indented by traffic, softened by atmospheric temperature, or disintegrated by weather to any appreciable extent, which could be laid in a homogeneous mass without joints and so laid as to easily carry off water to the gullies. There was only one material, *i.e.*, asphalte, which approached this standard, but even asphalte had disadvantages, for, as only the compressed asphalte is suitable for vehicular traffic, it could not be laid in that shape which the ideal road should have, and the finished surface had many small depressions. But the facility with which the asphalte road could be cleaned, the small amount of dust it gave rise to, the freedom from joints, and its non-absorbent qualities, served to place asphalte first for sanitary road purposes. Sanitary considerations alone were under consideration, and the point was not whether this material was suitable for horses, shod as they are now. Woodpaving had the disadvantage of many joints and it was absorbent, but the first objection could be got over by the use of bituminous grout for filling the joints, and the second by creosoting the blocks, or by the use of hard wood. Hard wood, however, shrunk considerably in dry weather, the blocks becoming loose and the joints enlarged, but he had not seen such changes in creosoted deal. A very accurately-shaped road could be formed of wood-blocks, making it easy to clean; but after a few years the blocks wore away unequally, and it was then not so easy to keep clean as in the case of the asphalte road. Granite setts, if the joints were filled with bituminous grout, made a practically non-absorbent road, but noisy and not so easily cleansed as the other paving materials mentioned. Authorities in large towns were prevented from using the most sanitary road material by the consideration which will provide the best foothold for horses, and it was a question whether a mode of shoeing could not be devised which would relieve the authorities from thus having to substitute the necessities of the horse for the health and convenience of the people.

Mr. Barber then dealt with cleansing roads. The most suitable material having been laid, the road was at once a receptacle for dirt and filth from various sources. The time was not near when horse traction would be superseded by motors; if it were so, the chief source of road pollution would soon be stopped. So, while regretting the conditions as they are, and while trying to improve them, it was necessary to take things as they are, and use the best available means for properly clearing away everything in the shape of dust, refuse, and filth from the streets. A well organised system of orderlies for removing filth and refuse in the day and a plentiful washing with water (unless sufficiently washed by rain) were necessary for thoroughly cleansing public thoroughfaces. The freeing of a road from semi-liquid mud or slop was a simple operation, but the removal during the day time, from a road crowded with traffic, of the thin film of greasy material which caused horses to slip was a most difficult task. Owing to the extreme thinness of the material to be removed it was unaffected by any tool that could be applied to it, whilst any attempt to wash it away by first watering the road and converting the greasy substance into slop, might unduly interfere with the traffic, and would certainly be much complained of by pedestrians. The borough engineer had but one remedy available for a road in the condition referred to, viz., to make a temporary surface by a plentiful sprinkling of sand or fine shingle, and to thoroughly wash the road at night. The removal from the roads of the mud and slop, which were produced in unlimited quantities in wet weather, was never carried out in a manner which satisfied the public. The work could be done in a reasonably efficient manner, and well enough to satisfy any reasonable critic, if a sufficiently numerous staff and the necessary amount of supervision were provided; this, however, could not be done without considerable expense.

Dr. Parkes first dealt with the health aspects of the question. It might be said at once that there was very little direct evidence that any injury to health was caused by the insanitary condition of London streets, chiefly because, out of the multiplicity of conditions favouring or exciting loss of health or actual disease amongst our population, it was most difficult, if not impossible, to select a certain agent where so many participate, and to say definitely this was the exciting cause. On the other hand, with the continual advances made in pathology and in bacteriology, we were enabled, as time advances, with more and more certainty to select *à priori* certain conditions as being those which from analogy we should consider to be capable of influencing the public health, and, although no complete proof was capable of demonstration, we were satisfied to regard these conditions as operative factors. Bearing in mind then the above limitations, we might say at once that there appeared to be two things intimately associated with our London streets that we might reasonably regard *à priori* as influencing adversely the public health. They were dust and mud—different names for essentially the same thing, for whilst dust was dried and powdered mud, mud was merely wetted dust. Now, as we all knew, the mud and dust of London streets, especially in the great highways of traffic, was filth; it was largely composed of putrefying organic matter from horse-droppings, with its teeming swarms of putrefactive bacteria. Which was the most dangerous to health, mud or dust? To this we could safely answer, dust. Why? Well, dust attacked our mucous membranes, *i.e.*, the delicate lining membranes of the orifices and passages leading to our internal organs. Mud did not; that was to say, unless the passer by happened to have a lump of mud splashed into his eye or mouth. Then again, the dry dust of the street not only got into our nostrils, throats, and possibly into our lungs, but it found its way into our houses, and, unless we were careful, settled on our food, and by its contained bacteria set up fermentative changes therein, which rendered it at times unwholesome, at other times positively dangerous. The irritating decomposing dust of the London main thoroughfares had been credited with causing sore throats, nasal catarrh, conjunctivitis, pneumonia, and numerous other diseases of the respiratory organs and passages; and it seemed at least highly probable that this organic dust, which was so much in evidence in the London streets in such months as March, when the wind was dry and boisterous, and which tainted the whole atmosphere in the warmer months of the year when rainfall was deficient, was a contributory if not the exciting cause of these and other diseases. The past year, 1903, supplied an experimental demonstration of the way in which relative absence of dust might conduce to a healthy season and a low death-rate. Last year was one of the healthiest years on record in London, and it was one of the wettest. In 1903, then, nature very materially supplemented the usual cleansing operations of the London municipalities, with the result that during the wet periods the roads presented a wonderfully clean appearance, and the private drains and public sewers received such a flushing as they had seldom received before. All this was most beneficial for the inhabitants of London, except perhaps for the unfortunate people whose basements were flooded by the storm waters which the sewers were inadequate to convey away. The lesson of 1903 would appear, then, to be that greater attention should be given to the flushing of our main thoroughfares with water, especially in the warm and dry months of the year. This was especially important in the case of asphalte and wood-paved roadways. On such surfaces the dirt consisted of little but horse-droppings, which very quickly desiccated and formed a strong and pungent dust, easily raised by the wind. All wood and asphalte streets which were main lines of traffic should be flushed with hose and jet, and subsequently swept, every morning from March to October, unless there had been heavy rain in the night. It was very commonly the practice to sweep the streets when dry, but this was a practice not to be commended, as the operation raised clouds of dust, which settled again, often out of reach of the broom, and the result was not satisfactory. In very busy thoroughfares, where there was much omnibus traffic, some disinfectant solution should be mixed with the water in the watering carts, not necessarily to disinfect, but to deodorise the dirty wood roadways, and to at least attenuate the odours about which so much complaint was made. Possibly a chlorinated solution, containing a small amount of available chlorine, would be the best for this purpose. Extra flushing and cleansing of the streets meant extra cost. There was no available supply of cheap, unfiltered water in London, and nothing had yet been done to draw a supply of water for flushing purposes direct from the Thames in London. The rates were already very high. Was it possible to go to greater expense in this matter? He found that in 1902 in Chelsea the cost of cleansing and scavenging the streets, including watering, was about 14,000*l*. The maintenance and repairs of the public roads, streets, and paths cost another 14,000*l*. Assuming that the whole metropolis spent a proportional amount in accordance with its population—an assumption which probably erred on the side of being under the mark, as Chelsea was a little off the main traffic routes—then the annual cost of scavenging and cleansing and watering the London streets was about 850,000*l*., and a similar sum was spent annually in maintenance and repair. If motor traffic could be made to supersede horse traction in London, it seemed probable that the cost of scavenging, cleansing, and watering could be reduced by half, and the cost of maintenance and repairs by a similar amount—a total saving of 850,000*l*. per annum. It was the horse that produced the dust, dirt, and mud that had to be laboriously collected by hand labour and carted to the outskirts, or barged away down the Thames. It was the horses' iron-shod feet that tore up the roadways and rendered necessary the enormous annual expenditure in maintenance and repair of the streets, and their periodical repairing at short intervals. If there were no horses the slop-water from asphalte and wood-paved streets could be swept straight into the gullies and so to the sewers, and the wear and tear of the street surfaces would be enormously reduced. Motor traffic, then, was a thing that the intelligent Londoner should encourage by every means in his power. It was the only real and lasting solution of the "insanitary street" problem. Enormous additional sums under existing circumstances might be spent in scavenging, cleansing, and watering, but the total result would not be very appreciable in a dry and hot season. We could not expect natural causes to aid

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us every year, as the weather did in 1903, nor was it otherwise a consummation to be wished for. Probably the best means of accelerating the transition from horse traction to motor traction would be—(1) the widening of the main lines of traffic, so that vehicles could proceed at a uniformly greater speed than at present. (2) Inasmuch as it was especially desirable that heavy two-horsed vehicles, such as omnibuses and drays, should be replaced by motor-driven vehicles, as it was essentially the heavy horses and heavy loads that, continually stopping and restarting, tend to break up the surface of the streets, it would seem desirable that omnibus companies and companies or firms carrying heavy goods should be encouraged to inaugurate motor traction by a system of municipal subsidies. If over a million and a half sterling was spent annually in London by the ratepayers in scavenging, cleansing, and repairs of the streets, necessitated chiefly by the employment of horses for all classes of traffic, 100,000*l.* annually might be devoted to a system of subsidies, by the aid of which a portion at least of the heavy horse traffic might be got rid of from the streets, and the cost of cleansing, scavenging, and repairs materially reduced. A beginning once made in this direction, the advantages of motor traction would soon be generally recognised, and in the course of a few years we might expect to see at least as many motor vehicles as horse vehicles in the streets. In his opinion, dogs in London were an unmitigated nuisance. The disgusting condition of the pavements and sidewalks in many parts of London was due to dogs' excreta. It certainly seemed desirable that our borough surveyors should seriously consider as to the best means of cleansing the footways, and so performing a duty which the State had cast upon them. To sum up, then, his conclusions, in one sentence:—"All animals in big towns, except of course man himself, are a nuisance. Let us do our best to get rid of them."

Mr. W. Whitaker, Chairman of Council of the Institute, proposed a vote of thanks to Mr. Barber and Dr. Parkes for their remarks on a most interesting subject. As to motor-cars, he thought that the dust nuisance they created was likely to do good in the direction of making the authorities do more road-watering than they do now. It would pay the authorities to do more road-watering, for watering prevented the rapid destruction of roads. Everyone thought that the year 1903 was a bad year on account of the rain, but he preferred rain to dust, and he hoped that the great natural object-lesson of last year, *i.e.*, the great gain to public health, resulting from laying the dust, would not be forgotten by the local authorities. It was in the power of many of our large corporations to modify the evil effects of dust by turning it into a state in which it could easily be removed from the streets.

Dr. Shirley Murphy said there was no doubt that what was wanted in every town was that the surface of the roads should be impervious, and that they should be washed or cleansed. He was told by London surveyors that the reason why we could not have this was the cost, but what would be worth working out was how much saving there would be in the cleansing of streets if large areas were paved with impervious material and washed, as against the scraping-up, etc., of mud from the cheaper macadam road. Probably the greater cost would be on the side of the impervious road, but the difference would not be so great. Of course, it would be necessary that the area to be paved with impervious material should be sufficiently large, otherwise mud from neighbouring macadam roads would be brought in by vehicles and the saving which ought to be effected would not be obtainable. It was greatly to be wished that there should be some general agreement between the different districts of London as to how a main and important road should be dealt with. He had discussed that with borough surveyors who had told him that it was impossible to have anything like uniformity over a very large area in London. The result was that, in the case of a road passing through two districts, the traffic being exactly the same, different road material was often used. That ought not to be so, and there ought to be experience to determine how all main and secondary streets and courts and alleys should be dealt with. The necessity for dealing with the poor streets, especially market streets, with impervious material, was obvious.

Mr. J. Paget Waddington, Borough Surveyor of Marylebone, said that the main question was one of money. The difficulty was to get the authorities to allow sufficient money to do the work properly. As to the construction of roads in suburban districts, and the suggestion made by Mr. Barber for forming carriage-ways of tar macadam, he (the speaker) had had some experience of this class of road in the north of England. He had constructed about three and a half miles of this form of carriage-way on a main road between two large towns, and, having regard to the cost, it wore remarkably well and was much more sanitary than an ordinary limestone macadam road, and there was much less dust and mud created. The material of the district was limestone, and that, coated with tar, was used for the work. The question of pavements for roads in London was a large one, and one upon which diverse opinions were formed. He should be sorry to see the whole of the carriage-ways of London turned into asphalte carriage-ways, though he quite admitted that up to the present time asphalte was by far the most sanitary and the most easily cleansed; but it was difficult for horses and dangerous to riders and drivers. But any paved roadway was dangerous under certain conditions. The carriage-way of Oxford-street at the entrance to Marble Arch was of Australian hardwood, and the number of complaints he had received from equestrians who went into the Park at Marble Arch was very numerous; when the time came for repaving the road he did not think the Borough Council would again use that material. Deal was a much safer material where horses were concerned. Yellow deal was a luxurious paving, but in his opinion it was worth the cost. Harley-street was paved some three or four years ago with yellow deal treated with carbolineum, and it was the only street of any consequence in the borough which had been so treated. The blocks were immersed in the liquid for about five minutes and then allowed to drip before being laid. During dry weather there was less dust on the carriage-way of Harley-street than on other streets adjoining paved with plain or creosoted deal, and after rain the Harley-street road dried more quickly than the others. That was the experience in an adjoining district, he believed. He thought that the blocks ought to be immersed for a longer period, but there was much to be said for this material. A short length of Albany-street, adjoining Marylebone-road, was paved seven or eight years ago with deal treated with carbolineum, but the blocks were then immersed for over thirty minutes, and the result was about the best piece of deal paving he knew of in London. During the five years that that road was under his control he could not recollect having had to repair it. He did not agree with the suggestion as to the abolition of horses and dogs: he was a lover of animals, and he hoped the day was far distant when we should see no horses or dogs in our streets; he would sooner retain the horses and dogs and pay a little more in rates to keep the streets clean. As to washing roads with water from a hose-pipe, that was done in some districts, but he had come to the conclusion that washing soft wood-paved roads—and, indeed, hard wood roads—with a hose-pipe was very injurious to the roads. The water was forced into the interstices of the blocks, the grouting material being washed out, and the blocks were set floating, with consequent damage to the foundations. He preferred the old-fashioned way of water-cart washing. All the wood-paved streets of Marylebone were washed every night by means of water-carts and squeegees. Machine brooms he used for one or two years, but he found that the work could be done more efficiently and economically by hand labour.

Mr. C. H. W. Biggs said it was a disgrace that it was necessary to have that discussion on such a subject. Each speaker said that we could have sanitary streets if someone would only pay the cost, and yet things went on just the same! The money for such work must come from the people, but it would not be forthcoming until the people were made to believe that sanitary streets would pay them. Would such streets pay them? The money value of health was far greater than the cost of keeping streets sanitary, and the way to get the money was to teach people to see this. Satisfactory macadam streets could not be made where there was heavy traffic, and that tar macadam was a better material they all knew; but it was not generally used, and when it was used it was not used to the best advantage. At such places as Cromer and Yarmouth, however, where there was a fairly heavy traffic, tar macadam was used, and it wore well and was sanitary. As to slippery wood roads, if the user of horses would put on a horse the worst possible form of shoe, then the owner was not doing his duty; the maker of the street did all he could with the money at his disposal. People did not have their horses properly shod.

Mr. T. Langster said that London streets should be asphalted as motor-cars were sure to increase and asphalte did not cut tyres as did stones and sharp grit.

Lord Monkswell, in putting the vote of thanks to the meeting, said he was in general agreement with what had been said that evening, that in all probability an increase in expenditure on cleansing roads was desirable, but he might observe that that was not the only matter on which increased expenditure was desirable.

The vote of thanks having been agreed to,

Mr. Barber, in reply, said they were preaching this sermon as to the sanitation of roads year after year with little effect. The matter was one of time; people required educating, and he thought they were becoming educated on the subject. If they gave the subject a minute's consideration, they must see that if a thing was to be done three times a week instead of once then the cost must be increased. We needed men who were absolutely fearless in the expenditure of money in the proper objects, and who were not afraid of the narrow-minded individuals who threatened with all sorts of pains and penalties the next time a vote had to be given. There was too great a cry as to reduced rates and expenditure made by those who knew they could not reduce rates or expenditure; expenditure on all matters as to public health and convenience in London must increase of necessity.

Dr. Parkes also replied, and referred to the work of the London County Council in providing electric traction in London—a work which would make an enormous difference in London in the course of a few years, which would free the streets of many horses, would provide rapid transit, and help to solve the housing of the working classes. He thought there must be more and more municipal expenditure as the years went on, though there might be a little more efficiency in the work which was done now. There was still an idea that any class of men was good enough for sweeping and cleaning streets, but it paid better to have young and intelligent men to do even work of that sort. Cheap labour was dear in almost all things.

On the motion of Mr. Norman Scorgie, seconded by Mr. Whitaker, a vote of thanks was accorded to Lord Monkswell for presiding.

Lord Monkswell replied and the meeting terminated.

The next meeting will be held on Saturday, March 26, when a discussion on "Municipal Housing" will be opened by Mr. W. E. Riley, Superintending Architect of the London County Council, and in the afternoon a visit will be made to certain buildings in the Metropolis.

BY-LAWS UNDER THE PUBLIC HEALTH (LONDON) ACT, 1891.

The Public Health Committee of the London County Council reported as follows at Tuesday's meeting of the Council, the recommendation being agreed to:—

Our attention has been called to a decision given on December 9 by the High Court (King's Bench Division) in the case of Nokes and Nokes *v.* the Mayor, Aldermen, and Councillors of the Metropolitan Borough of Islington, to the effect that by-law No. 26 made by the Council under section 39 of the Public Health (London) Act, 1891, in relation to the number of water-closets in proportion to the number of inmates in lodging-houses is invalid, as it does not provide for notice to be given before action is taken.

The by-law in question provides, *inter alia*, as follows:—"The landlord, or owner of any lodging-house, shall provide and maintain in connexion with such house water-closet, earth-closet, or privy accommodation in the proportion of not less than one water-closet, earth-closet, or privy, for every twelve persons."

Having regard to the importance of the matter, we at once instructed the solicitor to report as to the amendment in the by-law which was necessary in order to remove therefrom the defect which rendered it invalid, and he has now advised that a proviso should be added to the by-law to the effect that notice shall be given by the sanitary authority, and that a penalty shall only be recoverable if the person on whom the notice is served shall have failed to comply therewith.

There are certain other paragraphs in this by-law requiring the occupiers of premises to cause a periodical cleaning of water-closets, earth-closets, privies, cesspools, and receptacles for dung. Having regard to the provisions of section 30 of the Public Health (London) Act, 1891, it is necessary that these paragraphs of the by-law should be amended by omitting all reference to earth-closets, privies, and cesspools therefrom.

We append to this report (Appendix I.) a copy of the

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by-law in its present form, and in the form in which we are advised it should be amended.

We are at present considering generally the question of the amendment of the by-laws made under sections 16 and 39 of the Act above referred to, but we think that it is desirable for the Council to at once repeal by-law No. 26 and to substitute the amended by-law therefor; otherwise serious difficulty may be experienced by sanitary authorities in securing the provision of adequate water-closet accommodation in houses let in lodgings. Section 114 of the Act provides that in making any by-laws which will have to be observed and enforced by any sanitary authority, the Council shall consider any representations made to it by that authority, and at not less than two months before applying to the Local Government Board for the confirmation of any such by-laws, shall send a copy of the proposed by-laws to every such authority. We accordingly propose that copies of the amended by-law shall be sent to the sanitary authorities for their observations; and we therefore recommend that copies of the proposed amended by-law set out in Appendix I. to this report be sent to the London sanitary authorities for their observations, pursuant to the provisions of section 114 of the Public Health (London) Act, 1891.

The following is the Appendix, omitting the existing by-law:—

Proposed Amended By-law.

26. The occupier of any premises shall cause every water-closet belonging to such premises to be thoroughly cleansed from time to time as often as may be necessary for the purpose of keeping such water-closet in a cleanly condition.

The occupier of any premises shall once at least in every week cause every receptacle for dung belonging to such premises to be emptied and thoroughly cleansed.

Provided that where two or more lodgers in a lodging-house are entitled to the use in common of any water-closet or receptacle for dung, the landlord shall cause such water-closet or receptacle for dung to be emptied and cleansed as aforesaid.

The landlord or owner of any lodging-house shall provide and maintain, in connexion with such house, water-closet, earth-closet, or privy accommodation in the proportion of not less than one water-closet, earth-closet, or privy, for every twelve persons.

Provided that the landlord or owner of any lodging-house shall not be deemed to have offended against the last mentioned requirement of this by-law until the sanitary authority shall have caused notice to be served on such landlord or owner requiring him forthwith or within such reasonable time as may be specified in the notice to provide and maintain in connexion with such house, water-closet, earth-closet or privy accommodation in the proportion as aforesaid, and he shall have failed to comply with the notice.

For the purposes of this by-law, "a lodging-house" means a house or part of a house which is let in lodgings or occupied by members of more than one family. "Landlord" in relation to a house or part of a house which is let in lodgings, or occupied by members of more than one family, means the person (whatever may be the nature or extent of his interest) by whom or on whose behalf such house or part of a house is let in lodgings or for occupation by members of more than one family, or who for the time being receives or is entitled to receive the profits arising from such letting. "Lodger" in relation to a house or part of a house which is let in lodgings or occupied by members of more than one family, means a person to whom any room or rooms in such house or part of a house may have been let as a lodging for or his use or occupation.

Nothing in this by-law shall extend to any common lodging-house.

Illustrations.

RESTAURANT, GREAT PORTLAND-STREET.

THIS elevation shows the extension and alteration of Messrs. Pagani's building, which has been recently effected. Before these works the elevation consisted of two ordinary house fronts, with a small arcade of four arches on the ground floor, from the designs of Mr. C. Worley.

The adjoining house was added, the upper part of which was maintained, and the mezzanine arcade of three arches and one complete bay to the ground floor was added.

The whole of the upper fronts were covered with a glass mosaic and connected with a coved cornice.

These works were executed by Messrs. Hayward and Son, of Regent-street; the terra-cotta by the Leeds Fireclay Company; and the mosaic by George Bridge, of Oxford-street. BERESFORD PITE.

DESIGN FOR CAPE UNIVERSITY BUILDINGS.

THIS design, by Mr. W. F. Harber, did not gain any honours in the competition for new buildings for the Cape University, but we think it quite worth illustration as a design which shows both original character and a satisfactory unity of conception.

The plan explains itself. The exterior was intended to be built of granite, banded in two colours; the dome vaultings, flats, floors, and galleries would be of ferro-concrete. The dome above the granite steppings to be covered with granite chipping thrown on the cement. The hall and corridors were to be paved with mosaic, with hardwood blocks for the University Hall and other rooms.

Architectural effect has been sought for by mass rather than detail, which latter has been purposely avoided, except as regards the introduction of sculpture.

HOUSE AT MEDMENHAM.

THE drawing reproduced was the original design for a house at Medmenham, to be carried out in red brick, Portland stone, and tiles. The stables are shown to the right of the drawing.

The design was considerably altered in execution.

Mr. Blomfield sent us a plan, but too late to have it reproduced in this issue; we will give it in our next.

MANSFIELD HOUSE UNIVERSITY SETTLEMENT, BARKING-ROAD, E.

THIS building was erected in 1896 for the residence and necessary offices of the Mansfield House University Settlement, which had already been at work in the district since 1890. The hall, workmen's clubrooms, boys' club, and other centres of work are housed in different buildings close by, most of them also in the Barking-road. The building illustrated is, therefore, strictly residential, except for the suite of offices on the ground floor, to which the central door leads.

The structure is carried on a raft of concrete 3 ft. thick, covering the whole area, and stiffened with embedded steel joists where concentrated loads had to be distributed.

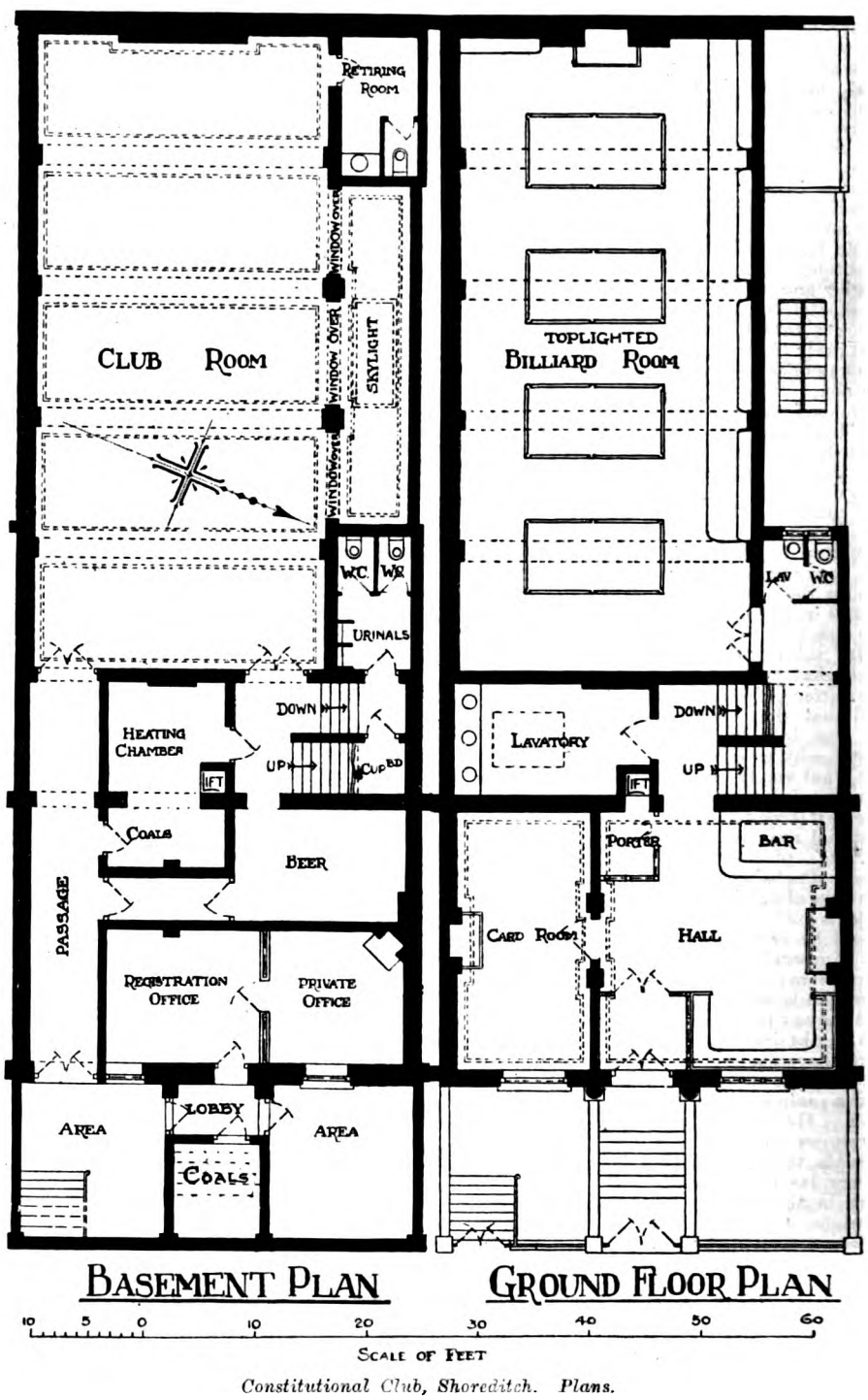
The lower portions of the front wall are of granite and salt-glazed bricks, the remainder of red brick, with Portland stone balcony, copings, etc. The Mansard roof is covered with lead and Westmorland grey slates. On the nearer portion of the roof a good-sized conservatory has been built, the main stair going up to the roof and giving access to it.

The two large rooms shown on the first floor plan are used for social gatherings of various kinds. The warden's suite of rooms are in the back wing of this floor. The two floors above consist mainly of single rooms, one or two, however, being double sets, for the residents and visiting workers.

The builders who carried out the work were Messrs. Gregar and Son, of Stratford, E., and the total cost was between six and seven thousand pounds. F. W. TROUP.

PAVILION FOR THE CONSOLIDATED CLUBS, MAGDALEN COLLEGE, OXFORD.

THIS pavilion was built, during last year, on the new ground between the Cherwell and the Marston road. It contains on the ground



Constitutional Club, Shoreditch. Plans.

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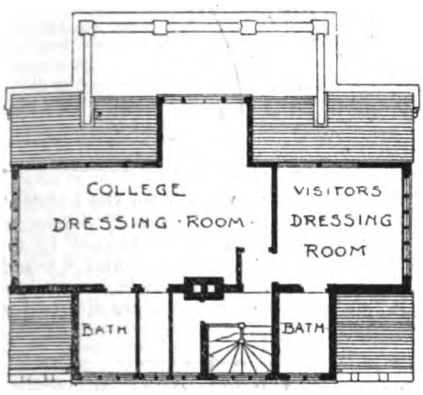
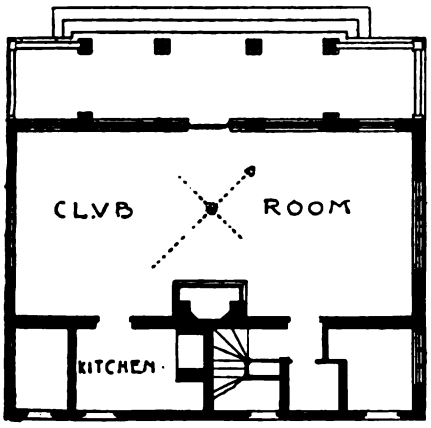
floor a club room 40 ft. by 18 ft., with a paved terrace and loggia in front, and kitchen, etc., at the back. On the first floor are college and visitors' dressing-rooms with hot and cold water supply, and bathrooms, etc.

The exterior is faced on the ground floor with yellow roughcast, and the roof and walls of the first floor are covered with special sand-faced red tiles.



FIRST FLOOR PLAN



GROUND PLAN

0 5 10 20 FT

Building for the Consolidated Clubs, Oxford. Plans.

The contractor was Mr. J. A. Hunt, of Hoddesdon, and the work was carried out from the designs and under the superintendence of Mr. Ronald P. Jones, M.A., architect, of London; a past undergraduate of the college.

CONSTITUTIONAL CLUB, SHOREDITCH.

THE present building, which was opened in December last, has been erected by the Directors of the Borough of Shoreditch Constitutional Club, in the New North-road, Hoxton, N.E.

The accommodation provided includes:—Club room, 56 ft. by 26 ft., with retiring-room, lavatories, etc.; billiard-room, 56 ft. by 26 ft., top-lighted: entrance hall with bar, card-room, grill-room, library, stewards' apartments, bedroom accommodation for members, and registration offices. The club-room will occasionally be used as a concert hall and is provided with a separate entrance from the New North-road.

The front elevation is carried out in buff terra-cotta and red bricks. The roof is slated with Precelly green slates. The contractors are Messrs. Sabey and Sons, of Islington; the electric lighting has been carried out by Messrs. Mather Brothers, of Farringdon-street; the heating by Messrs. R. Crittall and Co.; and the terra-cotta was supplied by the Hathern Station Brick and Terra-cotta Company.

The architect is Mr. Sydney W. Cranfield.

LIBRARY AT BROCKLEY.—At the meeting of the Lewisham Borough Council on Wednesday the Libraries Committee reported that negotiations with respect to obtaining a site for the proposed Brockley Library were completed. It was decided to invite nine local architects to send in designs for the new buildings.

COMPETITIONS.

WAKEFIELD CATTLE MARKET.—The Governors of the Charities some time since advertised a competition for plans for the reconstruction of the Cattle Market, and Mr. Vickers Edwards, the Architect to the West Riding County Council, consented to act as assessor. Fourteen designs were sent in. The first premium (50 guineas) has been awarded to Mr. C. W. Richardson, architect, Wakefield; and the second (25 guineas) to Mr. R. J. Girling, architect, Grantham.

THE ETON MEMORIAL.—The Headmaster of Eton writes to the *Times* that the committee have decided, as a first step towards obtaining a design for the proposed memorial building, to invite Old Etonians who are architects to compete.

POLICE STATION, WINDSOR.—The competition for police and fire stations, Windsor, has resulted in the selection of the design sent in by Mr. Lewis E. Hickmott, St. Raphael's, Codrington-road, Bishopston, Bristol.

WAKEFIELD UNION WORKHOUSE.—A competition for new receiving wards, attendants' rooms, porter's lodge, and new entrance gates, Wakefield Union Workhouse, limited to the architects resident within the limits of Wakefield Union, has been decided by the guardians of the Union. Nine sets of plans were sent in under motto and were submitted to Mr. Vickers Edwards, the architect for the West Riding of Yorkshire, as assessor, who placed the following in order of merit: First premium, 25*l.*, to those under motto "Economy;" second, "Light and Air," 15*l.*; third, "Vagrant," 5*l.* Upon opening the sealed envelopes "Economy" was found to be by Mr. John Day, 89, Kirkgate, Wakefield; "Light and Air," by Mr. Thornton, King-street, Wakefield; "Vagrant," by Mr. Newbald, King-street, Wakefield. The guardians adopted the report of their assessor and subsequently appointed Mr. John Day to carry out the works as their architect.

BOOKS RECEIVED.

UP-TO-DATE TABLES OF WEIGHTS AND MEASURES. By Alfred J. Martin, F.S.I. (T. Fisher Unwin).

RECENT EXCAVATIONS IN THE ROMAN FORUM, 1898-1904. A Handbook. By E. Burton Brown. (John Murray, 3s. 6d.)

STATELY HOMES IN AMERICA. By Harry W. Desmond and Herbert Croly. (Gay and Bird. 31s. 6d.)

THE COMMON-SENSE OF MUNICIPAL TRADING. By Bernard Shaw. (Archibald Constable and Co.)

ELEMENTARY PRINCIPLES OF GRAPHIC STATICS. By Edward Hardy. (B. T. Batsford, 3s.)

TABLE OF MULTIPLICATION, DIVISION, AND PROPOSITION: for Ready Calculation of Quantities, Wages, Wage Premiums, etc. By Robert H. Smith, M.I.M.E. (Archibald Constable and Co.)

THE YEAR'S ART: 1904. Compiled by A. C. R. Carter (Hutchinson and Co. 3s. 6d.)

The Student's Column.

ARCHES.—VIII.

THE principle of least thrust at the crown, which was briefly defined in our last article, deserves further consideration.

The segment of an arch represented in Fig. 44 is maintained in a state of equilibrium by the following separate series of forces:—

(1) The horizontal thrust Q at the crown.
(2) The reaction R at the abutment.
(3) The vertical forces w_1 w_2, etc.
(4) The horizontal forces h_1 h_2, etc.

For our present purpose it is not necessary to take into account the precise direction of the reaction R, applied at the point *b*, the exact position of which is not yet determined. As we assume the arch to be uniformly loaded over the entire span, the direction of Q may be taken to be horizontal, and we will take the point of its application to be at *a*, although the precise position of this point is as yet unknown.

Referring to Fig. 44 we see that

Q = horizontal thrust at the crown.
x_1 x_2, etc. = horizontal distances between *b* and the lines of action of the vertical forces w_1 w_2, etc., respectively.
y = perpendicular distance between *b* and the line of action of the horizontal thrust Q.
z_1 z_2, etc. = perpendicular distances between *b* and the lines of action of the horizontal forces h_1 h_2, etc.

Now, taking moments about *b*, we have:—

$$Qy = (w_1 x_1 + w_2 x_2 + .. w_x x_x) + (h_1 z_1 + h_2 z_2 + .. h_z z_z) \quad \ldots\ldots (4)$$

Whence:—

$$Q = \frac{\Sigma\, wx}{y} + \frac{\Sigma\, hz}{y} \quad \ldots\ldots\ldots\ldots (5)$$

It is evident that the value of Q is governed by the expression $\Sigma\, hz$, which represents the sum of the moments of the horizontal component of the external forces applied to the arch. In the present case we have not assumed any knowledge as to the nature of the material supported by the arch ring, and as already explained in Article VII. (pp. 170-171), it is impossible to prophesy the exact effects likely to be produced by either masonry or earth so supported. Owing to this inability, it is usual to neglect the value of $\Sigma\, hz$, when applying the hypothesis of least thrust at the crown.

The disregard of the factor $\Sigma\, hz$ in computations has the effect of giving a value for Q which is less than the actual value. Consequently the line of resistance corresponding with any value of Q so calculated must be nearer to the intrados at the haunches of an arch, than is the true line of resistance. Sometimes the conditions may be such that, while the line of resistance, as determined upon the assumption mentioned, is apparently in a safe position, the true line of resistance will really approach so closely to the extrados at the haunches as to threaten the stability of the arch. The development here indicated is somewhat unlikely in ordinary cases, and disregard of the factor $\Sigma\, hz$ usually leads to increased stability.

Omitting from consideration the effect of the horizontal component of the external forces, equation (5) is reduced to:—

$$Q = \frac{\Sigma\, wx}{y} \quad \ldots\ldots\ldots (6)$$

From the formula so modified, it is evident that the value of Q must be inversely proportional to the value of *y*.

Hence it follows, to obtain a minimum value for Q, the point of application *a* should approach as near as possible to the extradosal end of the crown joint E, consistent with stability against crushing of the stone.

By reference to Article VI., on p. 142, it will be seen that the distance of the point *a* from the outer extremity of the crown joint E should be equal to at least one-third the thickness of the arch at that place. Under this condition the average unit pressure will be one-half of the assumed unit working pressure; or, stated otherwise, double the value of the horizontal thrust Q divided by the depth of the crown joint will be equal to the unit working pressure

For the purpose of computing the value of *y*, it is necessary to know the direction of the thrust Q. In the present case we have assumed this force to be horizontal, but it should be mentioned that such an assumption is only justifiable for a symmetrical arch loaded uniformly over the whole span. When an arch is subject to heavy moving loads, as generally happens in the case of arches employed in bridge construction, the thrust at the crown cannot be horizontal under the influence of such loading, and its actual direction cannot be reliably defined even by the most complicated mathematical processes.

If the surface of the joint A is inclined, as shown in Fig. 44, the position of *b*—the point of application of R corresponding to a minimum value of that reaction—can only be found by trial, because the effect of moving *b* towards the intradosal extremity of the joint A, is to diminish the distance x_1 and simultaneously to increase the distance *y*. In practice, however, the distance of the point *b* from the inner extremity of the joint may be assumed to be equal to at least one-third of the thickness of the arch ring, whatever be the inclination of the springing joint.

In arches where the springing joint is horizontal, the position of *b* should be taken as near to the intrados as may be consistent with the crushing strength of the stone, safety being usually insured by placing the point *b* at one-third of the length of the joint measured from the intrados.

The *joint of rupture* of an arch is that joint

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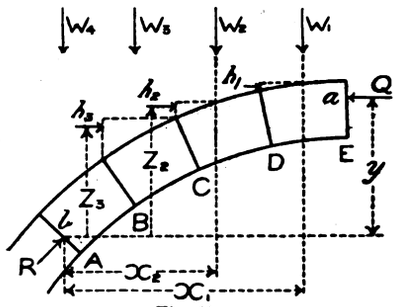

Fig. 44.

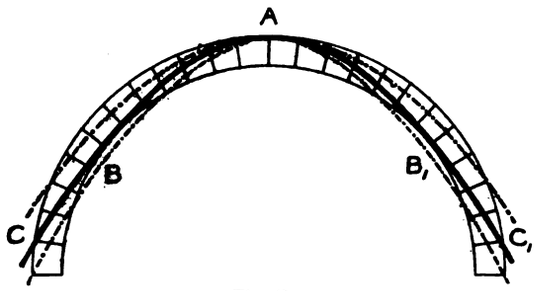

Fig. 45.

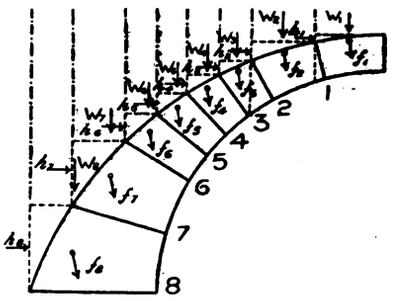

Fig. 46.

where the tendency to open at the extrados is greatest; or, otherwise defined, it is the joint at which the longest line of resistance, or linear arch, that can be drawn within the arch ring, is tangent to the extrados at the crown, and to the intrados at the haunches.

To make this matter clear we show in Fig. 45 a semi-circular arch and a series of three linear arches, all drawn for the same load, the difference in the shape of the curves being due to different horizontal thrusts. Here the heavy curve is evidently the longest linear arch that can be drawn within the ring. Any smaller horizontal thrust would give a curve such as the inner one in the diagram, and any larger horizontal thrust a curve like the outer one, and horizontal thrusts such as either of the latter are incompatible with the equilibrium of the entire arch down to the joints C C_1. If failure of the arch takes place by yielding of the abutments or of the lower portions of the ring, it will be first evidenced at the joints A, and B, B_1, where the middle curve is tangent to the arch ring, and at joint C where the curve cuts the back of the ring.

Horizontal thrusts smaller than that corresponding with the middle curve will serve to keep the voussoirs in equilibrium above and below the joints B, B_1, but unless that portion of the arch below B, B_1 and the corresponding abutments are able to resist the tendency of the arch to spread, the joints B, B_1 will open at the top, the crown joint A will open at the bottom, and the joints C, C_1 will open at the back.

The horizontal thrust necessary to make a linear arch—which is tangent to the extrados of the arch at the crown—pass through the extremity of the joint of rupture at the intrados, is greater than the horizontal thrust required to produce a linear arch passing through the extremity of any other joint in the intrados, and it is the smallest horizontal thrust consistent with equilibrium of the arch between B and B_1, and between B and C, and B_1 and C_1.

When the *apparent* springing is lower than the joint of rupture, the linear arch will fall outside the extrados at some point C, as in Fig. 45, tending to cause failure by rotation about the outer extremity of the joint affected. Such failure may be guarded against by the use of backing, and in cases where it is so used the backing really forms part of the arch, as stated in Article VII. Here we find an explanation of the work performed by backing, and one reason why the *real* arch differs in form from the *apparent* arch suggested by the visible ring of voussoirs.

It is obvious that the best method of providing backing for an arch is to make the ring thicker towards the springings, so that it may be in itself capable of resisting the forces developed. We are now able to see the reason why Rennie increased the depth of the voussoirs from the crown to the springing, as pointed out in Article II., p. 38.

The portions of the arch below the joints of rupture are often considered as parts of the abutments, and taking this view, the joint of rupture may be designated as the joint between the abutment and the springer. In order that no joint may open at the extrados, the value of horizontal thrust at the crown must be not less than that indicated by formula (5). If the thrust is of smaller value, the joint of rupture will open at the extrados, and if of greater value the conditions will be inconsistent with the hypothesis of least thrust at the crown. As the moment of the horizontal components of the external forces cannot be determined, the position of the joint of rupture must be ascertained by trial for assumed values and positions of the horizontal forces.

To illustrate this method we take an example given by Professor Ira O. Baker, showing the determination of the joint of rupture of a 16-ft. arch as employed by the Chicago, Kansas and Nebraska Railroad.* It is assumed that the arch supports an embankment of earth extending 10 ft. above the crown, and that the earth weighs 100 lbs. per cubic foot, and the masonry 160 lbs. per cubic foot. For the sake of simplicity a section of the arch one foot thick is considered. The semi-arch, shown in Fig. 46, and the earthern embankment above it are divided into eight sections, which are made smaller near the supposed position of the joint of rupture, so as to facilitate accuracy of determination. The weight of the first section rests upon the first joint, that of the first two sections upon the second joint, and so forth. The values and the positions of the lines of action of the weights of the several sections are given in the second and third columns of Table I.

TABLE I.—TO FIND THE JOINT OF RUPTURE OF ARCH RING IN FIG. 46.
(*Professor Baker.*)

Number of Joint, counting from Joint next to the Crown.	Data for Vertical Forces.		Data for Horizontal Forces.		Position of Centre of Pressure for each Joint.		Thrust at the Crown.		
	Amount of the Force.	Horizontal Distance of Point of application from the Crown Joint.	Amount of the Force.	Vertical Distance of Point of application from the top of the Crown Joint.	Horizontal Distance from the Crown Joint.	Vertical Distance from the top of the Crown Joint.	$\frac{\Sigma wx}{y}$	$\frac{\Sigma hz}{y}$	Total Thrust.
	lb.	Feet.	lb.	Feet.	Feet.	Feet.	lb.	lb.	lb.
1	2,938	1·20	66	0·10	2·20	1·18	3,866	94	3,960
2	3,045	3·57	243	0·55	4·27	1·86	7,744	308	8,052
3	1,644	5·33	192	1·17	5·27	2·42	8,518	424	8,942
4	1,716	6·45	259	1·78	6·17	3·11	**8,748**	662	**9,410**
5	1,825	7·50	315	2·53	6·98	3·90	8,577	700	9,277
6	1,888	8·47	415	3·40	7·71	4·81	8,407	941	9,348
7	3,939	9·77	1,030	5·02	8·85	6·84	7,506	1,407	8,911
8	4,098	11·05	1,624	7·70	9·50	9·25	5,990	1,983	7,973

We have already shown the difficulty of determining the value and position of the horizontal components of the external forces, but according to Rankine's theory of earth pressure† the horizontal pressure cannot be greater than three times, nor less than one third, the vertical pressure.

In the present example Professor Baker takes the horizontal intensity at one-third the vertical intensity; or, $h = (e\,d\,l) \div 3$, where $e =$ the weight of a cubic foot of earth, $d =$ the depth of the centre of the pressed surface below the top of the earthen embankment and $l =$ the vertical dimension of the surface. The values and positions of the horizontal forces acting upon the different sections of the arch ring are given in the table. The centre of pressure on any joint is assumed to be at a distance from the intrados equal to one-third of the length of the joint, and the co-ordinates to the several centres of pressure are given in the same table. The thrust at the crown is supposed to be applied at the upper limit of the middle third of the crown joint, the length of which is 1.25 ft., and the computed values of the crown thrust are given in the three last columns of the Table I. Inspection of the figures in the last column of this table shows that the thrust is at a maximum for joint No. 4, which may be taken as the true joint of rupture. Any increase in the assumed intensity of the horizontal components must proportionately decrease the computed value of the angle of rupture. For instance, if the quantities in the last column but one of the table be doubled, the maximum thrust will be at No. 7 joint.

As a general rule it will be found that the position of the joint of rupture is such that it makes an angle of 30 deg. with the horizontal for circular arches, and about 45 degrees for elliptical arches. The angle formed by the joint of rupture with the horizontal is termed the *angle of rupture*. This angle is sometimes measured from the crown, a practice causing unnecessary confusion.

* "Masonry Construction," p. 457.
† "Civil Engineering," p. 320.

AMERICAN PROFESSIONAL PRACTICE.

THE following is the statement of architects' charges, &c., as revised at the Convention of American Architects at Cleveland in October, 1903, and now officially issued by the American Institute of Architects:—

"The architect's professional services consist in making the necessary preliminary studies, working drawings, specifications, large scale and full size details, and in the general direction and supervision of the work, for which the minimum charge is 5 per cent. upon the cost of the work.

For new buildings, costing less than 10,000 dollars [2,000*l.*], and for furniture, monuments, decorative and cabinet work, it is usual and proper to charge a special fee in excess of the above

For alterations and additions to existing buildings, the fee is 10 per cent. upon the cost of the work.

Consultation fees for professional advice are to be paid in proportion to the importance of the questions involved.

None of the charges above enumerated covers alterations and additions to contracts, drawings, and specifications, nor professional or legal services incidental to negotiations for site, disputed party walls, right of light, measurement of work, or failure of contractors. When such services become necessary, they shall be charged for according to the time and trouble involved.

Where heating, ventilating, mechanical, electrical, and sanitary problems in a building are of such a nature as to require the assistance of a specialist, the owner is to pay for such assistance. Chemical and mechanical tests, when required, are to be paid for by the owner.

Necessary travelling expenses are to be paid by the owner.

Drawings and specifications, as instruments of service, are the property of the architect.

The architect's payments are due as his work progresses in the following order: Upon completion of the preliminary sketches, one-fifth of the entire fee; upon completion of working drawings and specifications, two-fifths; the remaining two-fifths being due from time to time in proportion to the amount of work done by the architect in his office and at the building.

Until an actual estimate is received, the charges are based upon the proposed cost of the work, and payments are received as instalments of the entire fee, which is based upon the actual cost to the owner of the building or

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other work, when completed, including all fixtures necessary to render it fit for occupation. The architect is entitled to extra compensation for furniture or other articles purchased under his direction.

If any material or work used in the construction of the building be already upon the ground or come into the owner's possession without expense to him, its value is to be added to the sum actually expended upon the building before the architect's commission is computed.

In case of the abandonment or suspension of the work, the basis of settlement is as follows: Preliminary studies, a fee in accordance with the character and magnitude of the work; preliminary studies, working drawings, and specifications, three-fifths of the fee for complete services.

The supervision of an architect (as distinguished from the continuous personal superintendence which may be secured by the employment of a clerk of works) means such inspection by the architect, or his deputy, of work in studios and shops, or of a building or other work in process of erection, completion, or alteration, as he finds necessary to ascertain whether it is being executed in conformity with his drawings and specifications or directions. He is to act in constructive emergencies, to order necessary changes, and to define the true intent and meaning of the drawings and specifications, and he has authority to stop the progress of the work and order its removal when not in accordance with them.

On buildings where the constant services of a superintendent are required, a clerk of the works shall be employed by the architect at the owner's expense."

COURT OF COMMON COUNCIL.

THE usual Court of Common Council was held at the Guildhall on Thursday last week.

On the recommendation of the Sanitary Committee, it was agreed to appoint the Chairman of the Committee, Mr. W. J. Downes, the late Chairman, Mr. R. W. Edwards, and the Medical Officer of Health, Dr. W. Collingridge, as delegates to represent the Corporation, as the Sanitary Authority for the City of London, at the annual Congress and Exhibition of the Sanitary Institute, to be held at Glasgow in July next.

Mr. Carl Hentschel asked the Chairman of the Streets Committee if he had given instructions for the work in connexion with the improvement of Long-lane, West Smithfield, to be continued day and night.

The Chairman of the Committee replied that he had instructed the engineer to see that that was done, but he understood that the inclement weather of the past few nights had prevented the continuance of the work. He considered, however, that some of the officers of the Corporation had not been doing their duty with regard to the carrying on of continuous work. The whole matter would shortly come before the Committee.

Major Vickers Dunfee moved, on behalf of Mr. F. G. Dray, "That the Bridge House Estates Committee be instructed to include in the plans for rebuilding Southwark Bridge an alternative scheme for giving protection from the weather, by an arrangement of light iron and glass, to be raised above the balustrades."

Mr. Deputy Millar Wilkinson said, in the course of a short discussion, that he considered the proposal impracticable and absurd. It was calculated to make the bridge look like a greenhouse.

The motion was carried, with the addition of the words, after instructed, "to consider the advisability of including," etc.

The Port of London Sanitary Committee reported on a letter from the Under-Secretary of State for War, relative to the discharge of sewage from military establishments into the river Thames within the jurisdiction of the Port of London Sanitary Authority. On the recommendation of the Committee, it was agreed to refer the matter to the City Solicitor, to obtain, and submit to the Committee, the opinion of the Law Officers of the Corporation as to what action, if any, could be taken, with a view to preventing the pollution referred to.

The Freemen's Orphan School Committee were authorised to expend a sum not exceeding 300*l.* in the erection of iron staircase fire-escapes at each end of the school building.

MEMORIAL HALL, CASTLETOWN.—A hall in connexion with St. Margaret's Church, Castletown, near Sunderland, has been erected as a memorial of the late Colonel Charles Briggs, of Hylton Castle. The hall, which occupies a site immediately contiguous to the church, measures 60 ft. by 27 ft., and will accommodate about 400 people. The architects were Messrs. Henderson and Hall, of Sunderland, and the contract has been carried out by Mr. T. Robinson, of Washington.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held on Thursday last week, at the City Hall, Charing Cross-road.

On the recommendation of the General Purposes Committee, it was agreed to hand over to the London County Council a stone coat-of-arms, in front of No. 8, Clare-street. The Committee reported that the arms were those of Gilbert Holles, Earl of Clare and Baron Houghton (titles apparently extinct), and bore the date 1665.

Amendments to By-laws under Sections 16 *and* 39 *of the Public Health Act*, 1891.—The General Purposes Committee reported that on presentments from the Public Health Committee and the late Works, Sewers, and Highways Committee, they had considered a letter from the London County Council, dated August 10 last, stating that that Council had under consideration the question of what amendments it was desirable should be made in the by-laws made by them under sections 16 and 39 of the Public Health (London) Act, 1891. The Council requested to be furnished with a statement of any points in which the City Council were of opinion that the by-laws required amendment. The Committee stated that the two above-mentioned Committees had made certain suggestions and observations, which had been considered by them (the General Purposes Committee). The following were the amendments suggested:—

By-laws under Section 16.

By-laws Nos. 1 *and* 2. [*Also No.* 25 *of By-laws under Section* 39 (1).]

That the by-laws be altered so as to permit of offensive refuse being removed between the hours of 12 midnight and 9 a.m. all the year round, and that under any circumstances the following exemption clause be inserted:—

"This by-law shall not apply to any person removing or carrying, or causing to be removed or carried, such fæcal or offensive or noxious matter or liquid, deposited in an impervious air-tight receptacle or receptacles, and removed or carried in the same impervious air-tight receptacle or receptacles—such receptacle or receptacles being cleansed periodically as required."

By-law No. 8.

That the word "suitable" or "properly covered" be added before the words "movable receptacle."

By-laws under Section 39.

By-law No. 1.

That words be introduced which would allow of water-closets being placed on the top floors of houses where the roof might be taken as the external wall with proper louvred lights, and with a view also to meeting the difficulty introduced by the Building Act, which permits of the ground floor of a building being entirely built over, the roof of such building might be taken as the external wall when the area of part of the ground floor extending beyond the main building is not less than 40 ft. in extent and efficient ventilation is obtainable.

That in the last paragraph of the by-law the words "constructed below the surface of the ground, and" be omitted.

That it is desirable that the floors of all water-closets be constructed of impervious material. (At present this requirement is only applicable in the case of external water-closets.)

By-law No. 2.

That the area of the window prescribed, viz., 2 sq. ft., is insufficient for the purpose of effectively lighting the water-closet, and should therefore be increased.

By-law No. 14.

That a new by-law be made that would prevent any subsequent structural alterations being made in premises which would in any way cause non-compliance with these by-laws.

That by-law No. 14 be amended so as to require the giving of notice to the Sanitary Authority of any structural alterations that may be made to a water-closet subsequent to its erection, as well as the giving of notice in regard to its erection, etc.

By-law No. 25. [*Also No.* 1 *of By-laws under Section* 16 (2).]

That where the receptacle is a suitable covered carriage, cart, or other contrivance in which the dung of horses or other cattle with stable litter is stored, and which is removed without disturbing the contents, this by-law should not apply.

The Committee recommended, and it was agreed, "that the London County Council be informed that the City Council are of opinion that the by-laws should be amended in the manner suggested in the above statement."

Projections over the Public Way.—The report of the Works Committee contained the following statement with regard to the authority for sanctioning projections over the public way:—

"Upon the notifications from the London County Council of their decisions on applications under the London Building Act, 1894, being submitted to us, our attention was called to the fact that one notification referred to the retention of an illuminated sign at the Tivoli Restaurant, Strand. Upon this application being first notified to us by the London County Council, we pointed out that the section of the London Building Act under which the application was stated to be made does not apply to this class of projection, and that the London County Council have no power to deal with the application, but that they should make by-laws for the regulation of lamps, signs, and other structures overhanging the public way, pursuant to section 164 (1) of the London Building Act.

"The Act provides that on such by-laws being made they shall be administered by the local authority. Ever since the passing of the Act, the London County Council and the various local authorities have differed with regard to this question, and although upon more than one occasion the County Council have drafted by-laws, the draft has not commended itself to the authorities whose duty it would be to administer the by-laws, and, as a result, the by-laws have not been confirmed.

"The obvious intention of the legislature when passing the London Building Act was that projections of the character above described should be the subject of by-laws to be administered by the local authority, and we are of opinion that the difficulties which have arisen are caused by the failure of the London County Council to make reasonable by-laws for such purpose, although the Act has been in force for over eight years.

"Under these circumstances we have suggested to the Building Act Committee of the London County Council that a small Sub-Committee of our members, consisting of the Mayor, our Chairman and Vice-Chairman, and Alderman Everitt, should meet them and discuss the whole question, with a view to steps being taken for its settlement."

The same Committee recommended, and it was agreed, that the City Engineer be authorised to carry out additional works at the jetties at Grosvenor-road Wharf, in accordance with the requirements of the Thames Conservancy. The estimated cost is 150*l.*

The Committee further reported on a letter received from the Wandsworth Borough Council, forwarding a copy of the following resolution passed by that Council:—

"That where any 'new street' which is within the provisions of the Metropolis Management Acts relating to the paving of new streets or any part of such street, abuts on one side on any open space dedicated to or held for the recreation or benefit of the public, a fair proportion of the cost of the first paving of such streets or part of a street ought to be charged against the said open space, and be borne by the body or persons answerable for the maintenance of such open space in the same manner and to the same extent as if such open space was land belonging to a private owner, and that the London County Council be requested to take such steps as may be proper for giving Parliamentary sanction to the above-stated principle."

The Committee stated that they had been informed that cases similar to that referred to were not likely to occur in Westminster, and that therefore the Council had not sufficient knowledge on the subject to form an opinion. It was agreed to inform the Wandsworth Council accordingly.

The Council, having transacted other business, adjourned.

ROYAL COMMISSION ON LONDON LOCOMOTION.

AT the sitting of the Commission, under Sir David Barbour, on Friday last week, further evidence was given by Mr. J. E. Waller, M.Inst.C.E., who strongly advocated the establishment of a Traffic Board, which, he would prefer, should be a Government department, and deal with tramways over the whole of the country. In the case of municipal tramways, where there was a loss on the working, he thought the Traffic Board should be allowed to come in and deal with the rates of pay, hours of labour, etc., of the employees. He suggested that the Board should invite companies to make offers for working the tramways on lease, and, if the offers made were favourable, the working should be taken out of the hands of the municipalities.

Mr. C. E. Baker, Hon. Secretary of the Urban District Councils Association, said he was in favour of an independent tribunal to deal with the traffic in and out of London. He considered that there should be more main radiating roads out of London, to be constructed by widening and straightening existing lines. With regard to the widening of High-street, Brentford, to make it more suitable for tramway purposes, it would be a

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serious burden on the locality if the local authority had to pay for the widening.

Mr. C. G. Mott, Chairman of the City and South London Railway Co. for the past eighteen years, said he considered that they could only look for serious relief of the future growing traffic of the Metropolis to the construction of deep-level underground railways. He pointed out the impossibility of such railways going under private property, because they had to pay for the sub-soil. While the cost of the sub-soil was not great, the legal costs of conveyance were very heavy, and he felt that Parliament might fix some uniform sum to be paid, and so avoid legal expense. The witness sketched the history of the City and South London Railway Company, and strongly advocated the construction of subways, by which different underground stations could be linked up. He favoured the existing system of procedure in the case of Parliamentary bills, but urged that a permanent committee might be appointed, consisting of members of the Board of Trade, Home Office, and Local Government Board, which should sit frequently and report to Parliament at the commencement of each session on all bills affecting railways in the Metropolitan area, and such reports should be referred to the various committees to whom the bills are sent. The permanent committee should also have as one of its duties the constant consideration of how best to improve the means of locomotion, and to draw out comprehensive plans for that purpose. It should have power to make suggestions to the County Council and Borough Councils upon any matters where it considered improvements could be made with regard to traffic.

Mr. A. E. Gathorne Hardy, Chairman of the East London Railway, suggested that in any measures taken for the improvement of the means of locomotion, by the development of intercommunication between railways and tramways, due consideration should be given to the position of the East London Railway.

OBITUARY.

MR. ROBERT ELLIN.—We learn from New York of the death of Mr. Robert Ellin, an architectural stone and wood carver, who was an Englishman by birth, and commenced his work in this country, but in 1867 emigrated to the United States, and made a great success in New York, where he founded the firm of Ellin and Kitson. He was looked upon, according to the *New York Herald*, as "The founder of the artistic stone-carving business in New York." To have started and carried on a large firm, with many working under him, Mr. Kitson must, of course, have had other qualities and abilities besides those of talent as a carver. Mr. Ellin executed the carving on the exterior of the house of Mr. W. K. Vanderbilt, and the wood carving in the hall and stairway and dining-room; and his firm carried out the exterior and interior carving on the house of Mr. Cornelius Vanderbilt; also that on the marble arch in Central Park, and many other works.

MR. EMANUEL.—We regret to announce the death on Sunday, February 14, at his residence, No. 147, Harley-street, W., of Mr. Barrow Emanuel, in his sixty-third year. Mr. Emanuel was partner, with Mr. H. D. Davis and, latterly, Mr. H. C. Smart, of the firm of Messrs. Davis and Emanuel, of No. 2, Finsbury-circus, E.C. He was a native of Portsmouth, he graduated M.A. at Trinity College, Dublin, and was a Justice of the Peace for the County of Middlesex. Of the architectural works carried out by the firm the following have been illustrated in *The Builder*:—The Kent-street, Portsea, Schools for Portsmouth School Board, jointly with Messrs. Mileham and Kennedy (May 2, 1874); the City of London School, Victoria Embankment, for which they won the first premium in competition, and subsequently modified the plans of the premiated design for the School Committee (May 15, 1880, and, interior of the great hall, December 16, 1882); a block of buildings in Cartwright-street, Royal Mint-street, for the East-end Dwellings Company, as architects to the company (March 28, 1885); the Yarrow Home for Convalescent Children, Broadstairs (August 3, 1895); and the Synagogue in Lauderdale-road, Maida-hill (December 26, 1896). The firm were appointed architects of, and carried out, the Albert-road, Portsmouth, School Board Schools, jointly with Messrs. Mileham and Kennedy; the Synagogue in Upper Berkeley-street, W., in competition; the East London Synagogue at Stepney-green; premises in Throgmorton-street, E.C.; a block of industrial dwellings, Gibson's Buildings, at Stoke Newington (1884); a block in Cromer-street, Gray's-inn-road, for the East-end Dwellings Company (1891); and some buildings in Lloyd's-avenue, E.C., after they had laid out that new thoroughfare from Crutched-friars to Fenchurch-street. They were architects also of the branch offices of the London and Joint Stock Bank, erected upon the site of St. Michael's Church, Wood-street, E.C. (1898); the Convalescent Home for the London Hospital Extension at Felixstowe; the house on the site of the stabling and part of the garden of No. 147, Harley-street (1897); the offices, at Nos. 60-62, Finsbury-pavement, of the North Metropolitan Tramways Company and Provident Society; etc., etc. On January 1, 1902, Mr. Emanuel and Mr. H. D. Davis took into partnership Mr. H. C. Smart, who had been in their office for a period of fifteen years, but made no change in the style of the firm. Mr. Emanuel was a member of the Jewish Board of Guardians, and of the Council of the Anglo-Jewish Association; he took a warm interest in the housing of the industrial classes.

GENERAL BUILDING NEWS.

ST. JOHN'S CHURCH, KIDDERMINSTER.—The Church of St. John, Kidderminter, has just been reopened after restoration. In 1891, when it was found that the old blue brick church was quite inadequate to the growing needs of the congregation, reconstruction and enlargement in some form was decided on. The first and second portions of the scheme were carried out in 1893-4, at the cost of nearly 10,000*l*. These consisted of a new nave, 24 ft. wide and 90 ft. long, on the north side of the old church, with a chancel and apse at the east end 44 ft. long, a north aisle, and also a vestry. During the last year, workmen have again been busy in the church transforming the old portion to be in harmony with the newer work. The old flat roof and the plaster walls have now disappeared, and their place is taken by a nave aisle, south aisle, and transept, built of red and buff brick, with Bath stone columns, shafts, and mouldings, and an open timbered roof running from end to end of the same character as that of the nave. The new arcade is somewhat similar to the others, and carries a clerestory, with perpendicular traceried windows. At the east end of the nave aisle the old apse has been reconstructed in redstone, harmonising with the chancel and chancel apse, and the reredos has been cleaned. The transept extending southwards, terminated by the south porch, is the principal entrance to the church. This south porch is a prominent feature outside. The entrance archway is moulded and traceried, surmounted by a niche and canopy, in which some day is to placed a carved figure of St. John the Baptist. The total length of the church inside is 134 ft., and it is 74 ft. wide, with the south transept 20 ft. in addition. There are now three arcades in the church. The church accommodates over 1,000 people. The work has been carried out by Messrs Collins and Godfrey, builders, of Tewkesbury, from the designs of Messrs. J. A. Chatwin and Son, of Birmingham.

CATHOLIC CHURCH, SWANAGE.—The Bishop of Plymouth recently laid the foundation-stone of the new church to be dedicated to the Holy Ghost and St. Edward King and Martyr, which is to be erected at Swanage. The site is situated at the corner of Victoria-avenue and Rempstone-road, and the church will be erected from the designs of the architects, Messrs. Scoles and Raymonds, of Basingstoke. The builders are Messrs. Parsons and Hayter. The church will consist of nave, sanctuary, aisles, side chapels, and sacristy, though only the nave and transept chapel (which will be used as a sacristy) are to be built at present. The nave will be 61 ft. long and 22 ft. wide, and will be entered from a narthex porch, to which there will be two outer doors, and it will also contain the staircase to the organ gallery, situated above the porch. The walls will be faced on the outside with Purbeck stone, random coursed and rock faced, and the dressings and freestone will be of the same kind. Facing Victoria-avenue will be the main entrance, which will be recessed, and with a moulded arched head, the tympanum being filled in with carving. Over this doorway will be a four-light tracery window. There will be two niches for statues, one in the side wall of the nave, and the other in the gable of the chapel. The roof will be covered with tiles, and at the intersection of the nave with sanctuary there will rise above it a bell turret. On the inside the walls will be finished in tinted stucco, and the stone-work will be of Bath stone. The ceiling of nave will be white in panels, with the intersecting wooden ribs stained dark, and the ceiling of chapel will be of pitch-pine. On the right a stone arch will open to the chapel, and opposite to it a small archway, for the present to be blocked up, will show where the entrance from the future sacristy will be. The big chancel arch, about 27 ft. high, will also be blocked up by a temporary wall, and 14 ft. of the nave will be raised above the general floor level for a sanctuary until the permanent one can be built.—*Tablet*.

WESLEYAN MISSION CHURCH, ST. PHILIP'S MARSH, BRISTOL.—The memorial-stones have just been laid of a new Wesleyan Church in Victoria-road, St. Philip's Marsh. The hall will consist of a nave, with short aisles on either side. The nave is 45 ft. 9 in. long by 24 ft. wide, with a platform at the back raised above the nave. There will be a gallery round three sides, supported by iron stanchions encased in wood, and approached by two staircases. There are three entrances leading directly into the hall; two of these entrances lead to the gallery. There is a fourth entrance through the minister's vestry. The hall roof will be in one span, and will rise to a height of 27 ft. to the ceiling line, and 31 ft. 6 in. to the ridge of the roof. The building will be lighted by a five-light, semi-circular window in the front gable, and also by ten two-light windows, five on each side, four under and six above the gallery, to be filled with cathedral glass in lead lights. There are six class-rooms; three school class-rooms, average size 11 ft. by 8 ft.; one Bible class-room, 24 ft. by 15 ft.; one infants' class-room, 24 ft. by 11 ft.; and a minister's vestry, 13 ft. by 11 ft. There is also a library, and a scullery for tea meeting purposes, in connexion with a heating apparatus chamber in the basement, 17 ft. by 10 ft. 6 in. in size. The various school class-rooms can be thrown into the hall by the removal of screens and curtains. For Sunday school purposes and for social meetings the hall will accommodate 450—254 on the ground floor and 196 in the gallery. The walls throughout are to be of hard-burnt bricks, faced with Cattybrook bricks. The stone dressings are to be of Monks Park Bath stone. Mr. Robert Curwen, London, is the architect; and Mr. W. Foster, Bristol, is the builder; while Mr. G. Bright, of Newtown, Bristol, is acting as clerk of works.

METHODIST CHURCH, HEXHAM.—Plans have been selected by the Trustees of the Hexham Free Methodist Church for a new church and schools to be built in the Fair Field at the west end of Hexham, and opposite Leazes-terrace and Shaftoe-leazes. The design selected was submitted by Mr. T. E. Davidson, architect, of Newcastle and London.

UNITED METHODIST FREE CHURCH, LOSTOCK HALL, NEAR PRESTON.—Plans have been passed for a new United Methodist Free Church at Lostock Hall, near Preston, and the foundation-stone will be laid in April. The church will be erected from the plans of Mr. Dinsley, of Chorley, and the estimated cost is about 3,200*l*. It will be built on a site in Watkin-lane, in the grounds of Lostock House.

SCHOOLS, ATHERTON, LANCASHIRE. — The National Schools at Atherton have been re-opened after alterations and additions. The old buildings have been repaired and remodelled, and converted into a junior school, arranged with six class-rooms opening out of a central hall. A new school for the upper standards opens out from the old building. It has its own separate entrances and cloak-rooms, and consists of a central hall surrounded by five class-rooms, one of which is fitted up for cookery class-rooms. The old and new buildings are so connected that they may be conducted under the supervision of one headmaster. The schools provide accommodation for 620 children. Mr. Isaac Taylor is the architect, and Mr. John Dickinson, of Bolton, the general contractor.

SCHOOL, PUDSEY.—A school-room, built from plans prepared by Mr. Appleyard, of Bramley, and erected at a cost of 1,112*l*., in connexion with the United Methodist Free Church, Bethel Chapel, Lowtown, Pudsey, was opened recently.

TECHNICAL SCHOOL AND FREE LIBRARY, BRIERLEY HILL.—The building which has been erected in Brierley Hill for the joint accommodation of the Technical Institute and Public Library was opened a few days ago. It is situated at the junction of Moor-street and Bell-street, the entrance to the technical school being in the former, and to the library in the latter street. Mr. J. Lewis Harpur, Surveyor to the Urban Council, is the architect.

INFECTIOUS DISEASES HOSPITAL FOR STRANRAER.—The Local Government Board having recommended a new Infectious Diseases Hospital for the burgh of Stranraer and the Upper District Committee of the County Council, a meeting of Stranraer Town Council was held on Monday night, at which it was agreed to adopt the plans and specifications prepared by Messrs. Spiers and Co., Glasgow, for a new structure to be built of iron and wood.

AUCTION MART, SHREWSBURY.—A new covered auction mart has been erected in the Smithfield, Shrewsbury, by the Corporation, for special sales of store cattle. The building has cost 1,000*l*., and has been erected from the designs of Mr. Eddowes, the Borough Surveyor.

NEW HOTEL AND STABLES, CROYDE, BARNSTAPLE.—It is proposed to build a new hotel and stables at Croyde, Barnstaple. Plans have

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been prepared by Mr. J. C. Southcombe, architect, and the total cost of the work will be under 3,000*l.*

LODGING-HOUSE FOR WOMEN AT SOUTHAMPTON.—The foundation-stone has just been laid of the new lodging-house for women, which is the result of the conversion of the Ragged School and Palk Memorial Home, at Houndwell, Southampton. The new premises will provide accommodation for between fifty and sixty women. Messrs. Jurd and Sanders were the architects, and the work has been carried out by Messrs. H. Stevens and Co.

SANITARY AND ENGINEERING NEWS.

CONCRETE-STEEL BRIDGES AT ROCHDALE.—Two works now in course of construction at Rochdale are interesting, although not monumental, examples of the usefulness of concrete-steel. One is a covering for the river Roch, in the centre of the town, for a length of 300 ft. by 60 ft., so as to form an open space which will be used as a sort of terminal for a system of electric tramways, and the other comprises two arch bridges, each of 24 ft. span, to carry a new street 45 ft. wide over the river Spodden. With regard to the river covering, we may point out that concrete-steel, besides offering advantages in the way of construction, is a particularly suitable material for a structure exposed on the underside to vapour emanating from the river. The continual examination and painting that would have been absolutely essential in the case of ordinary steel construction will be entirely avoided, thus effecting a great saving in the way of maintenance. In the case of the two bridges, the special reason for the adoption of concrete-steel has been the difficulties presented by the presence of old colliery workings under the sites. These workings contain water, which is being pumped out and used for industrial purposes, and, after careful consideration, it was decided to annul a contract already let for the construction of steel bridges. The new bridges are founded on concrete-steel piles, passing through the old workings into the clay beneath, and the foundations provide for possible alteration of the river bed, which may arise at some future time if adjoining weirs should be abandoned.

SANITARY ASSURANCE ASSOCIATION.—The twenty-third annual meeting of the members of this Association was held on Monday last, the 15th inst., at the offices, 5, Argyll-place, W., Mr. Andrew Stirling, President, in the chair. In the annual report the council expressed regret that the principle of a Sanitary Registration Bill, promoted by the Association, has not yet received the sanction of Parliament. The income of the year was 202*l.* 15s. 7d., which, after meeting all liabilities, left a balance in hand. The report was adopted on the motion of the Chairman, seconded by Mr. Mark H. Judge, and the retiring members of the council, Mr. Walter Butler and Dr. Willoughby, were re-elected.

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science held at Plymouth, on February 12 and 13, two candidates presented themselves. The following candidate was granted a certificate:—J. S. Knight, Tavistock.

FOREIGN.

FRANCE.—In virtue of a decree of the President of the Republic, the square forming the intersection of Rue Auber and Rue Scribe is to be named Place Charles Garnier. The newly-named "Place" is just in front of the monument to Garnier.——Mr. Charles Lefebvre has been appointed architect to the Colonial Office.——The Louvre has acquired for 90,000 francs, at a public auction, a curious antique stele, of Egyptian work, decorated on one face with a sculpture representing a hawk and a serpent. It has been found during the excavations carried out at Abydos by M. Amélineau.——It is supposed that M. Carolus-Duran is the most likely person to be elected to fill the place of Gérôme at the Académie des Beaux-Arts.——The Condé Museum at Chantilly has been enriched by various objects left to it in his will by Gérôme.——The church at Beaulieu (Indre et Loire) is to be restored, at a cost of 100,000 francs.——M. Lucien Pallez, the sculptor, has been commissioned by the Franco-Italian League to execute the statue of Victor Hugo, which is to be offered to the City of Rome.

GERMANY.—The Hotel of the Four Seasons at Münich has been enlarged and decorated; the work was carried out by the firm of Heilmann und Littmann, and the interior decorations by the artists Herr Paul Rieth and Herr Max Obermayer. Instead of the ostentatious luxury and display of costly materials usually found in modern hotels, the building has been decorated in such a manner as not only to insure bodily comfort, but also to satisfy the artistic sense.——The restoration of the Church of St. Lawrence, at Nuremberg, has been placed in the hands of Professor Josef Schmitz.

AUSTRIA.—The foundations are being laid of the new Geographical Institution in Vienna; the building is to be four stories high, and is to contain rooms for printing, lithography, and photography. The work has been entrusted to the architects Herr Stigler and Herr Siedek.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Frederick Rings, architect, Bank-chambers, Tooley-street, has entered into partnership with Mr. John Myers, of 33, Randolph-crescent, and the practice will be carried on under the style of Rings and Myers, at 21, Railway-approach, London Bridge, S.E.——Mr. Morley Clarke, civil engineer, 94, Market-street, Manchester, has taken into partnership Mr. Basil Pendleton. The practice will be carried on under the style of Morley, Clarke, and Pendleton.——The Edison and Swan Electric Light Company have opened new West-end show-rooms at 60, Great Marlborough-street, W.——Messrs. Frank Jordan and Co., 15, George-street, Mansion House, are appointed the agents for London and the south-eastern district of Messrs. Holdsworth and Sons, boiler makers, of Bradford.——Messrs. George Howson and Sons (Eastwood Sanitary Works, Hanley) have removed their London office to 20, Sandland-street, Bedford-row, W.C.——Messrs. Lane and Son, builders and decorators, 25 and 41, London-street, Kingston-on-Thames, have taken into partnership Mr. W. H. Farley, their confidential clerk for many years. The style of the firm remains as before.

FRAZZI FLOORS.—Messrs. Albert Gray and Co. send us a model of one form of the Frazzi floors, of which he is London agent. This is a form of fire-resisting floor, in which, for steel joists of from 2 ft. to 4 ft. 3 in. span, the filling is made by a hollow-chambered terra cotta beam, the bevelled ends of which rest on hollow skewbacks of the same material, which protect the steel, and are carried by the lower flange of the steel joist, which fits into a groove in the terra cotta. Thus a hollow fire-resisting ceiling is formed, which can be put up without scaffolding, and which should be a good non-conductor of sound. Upon this terra cotta beam is a concrete filling, which is entirely carried by the terra cotta. The floor appears, as far as one can judge from the model, to be an exceedingly good one, with a great deal to recommend it in the way of simplicity, lightness, and economy.

CONSISTORY COURT OF LONDON.—Dr. Tristram, K.C., Chancellor of the Diocese, has agreed to issue two faculties relating to the churches of St. Giles, Cripplegate, and St. John, Clerkenwell. In the former instance, the vicar and churchwardens sought for authority to make some alterations and improvements consequently upon the demolition of the "Quest House" and other buildings in Fore-street, and the laying out of the ground thus gained, which we lately described. The faculty will extend to (*a*) the closing up of the small round window at the east end of the north wall of the north aisle, which is now brought into view; (*b*) the erection at the north entrance into the church of an interior oak screen or lobby, for which it is proposed to use some of the old woodwork from the recently demolished church of St. Bartholomew, in Moor-lane; and (*c*) the making of a path across the church-yard to lead to the principal entrance, and the lowering, to the extent of about 2 ft. 6 in., the level of the ground thereabout. The last-named alteration is to be made concurrently with the scheme for closing a part of the old pathway, and making a new entrance into the church-yard over the land which has been bought from the Corporation of the City of London. The closing up of the comparatively modern circular window is desired in connexion with the project for restoring that portion of the north wall of the church, as far as possible, to its pristine condition. The other faculty relates to the vesting in the Finsbury Borough Council of the disused burial-ground in Benjamin-street, Turnmill-street, of the Church of St. John, Clerkenwell, which, having been closed in 1853 by an Order in Council, and being charity property, was vested in trustees by an order of the Charity Commissioners in May, 1881. A faculty was granted four years afterwards for the laying out of the burial-ground as an open space. It was laid out as a public garden, being about one quarter of an acre in extent, upon a plan supplied by the Metropolitan Public Gardens Association, at a cost of some 100*l.*, defrayed by subscriptions, and opened to the public in July, 1885. The garden has since been maintained by a committee, whose members are appointed by the Clerkenwell Vestry and the Holborn District Board of Works, both of which bodies are now represented by the Borough Council of Finsbury.

SMALL-POX HOSPITAL, MOOR CROFT, NEAR BILSTON.—It is proposed to erect the new South Staffordshire Joint Small-pox Hospital on a site at Moor Croft Colliery, near Bilston, and a Local Government Board inquiry into the matter was recently held at the Wolverhampton Town Hall, an application having been made for a loan of 15,000*l.* for the purposes of the scheme. Numerous plans were produced, and it appeared from the statement made to the Inspector (Mr. R. J. Reece, M.D.) by the Clerk (Mr. H. Brevitt) that the population of the area over which the hospital would operate is 337,387 persons, the rateable value 970,877*l.*, and acreage 34,183. It is proposed to spend 3,484*l.* on temporary buildings. The hospital would occupy a site of 49 acres, around which it is proposed to erect an iron fence at a distance of over 40 ft. An arrangement has been made with the Bilston Urban District Council for a supply of water, and a system of irrigation is to be adopted. The ward blocks will each contain sixteen beds, and the administrative block will afterwards be used as an observation building. After the completion of the works, the permanent administrative block, discharge block, lodge, laundry stables, and so forth, will be pushed forward. Mr. George Green, the architect, gave evidence, and there was no opposition.

THE EAST-END DWELLINGS COMPANY.—The report of this company to be submitted to the twenty-first ordinary general meeting on February 22 states, among other things, that the company has entered into possession of an important leasehold site, with frontages to Cromer-street and Tonbridge-street, near St. Pancras Station. The site has been cleared, and building operations commenced. The new buildings have been named "Tonbridge Houses," and will comprise 239 rooms, divided into seventy-three tenements of three rooms each, and five tenements of four rooms each, as well as accommodation for a superintendent. This site adjoins the company's Cromer-street estate, and the new buildings, when ready, can be conveniently managed therewith. There is a good demand for dwellings in the district, and it is anticipated that there will be no difficulty in letting the new buildings. The letting of the company's properties has been quite satisfactory, with the exception of the buildings in and near Victoria Park-square, and Globe-road, Bethnal Green, where it still proves difficult to secure eligible tenants in sufficient numbers. A reduced scale of rents has recently been adopted, in the hope of effecting a diminution in the number of empty rooms.

WESTON-SUPER-MARE MASTER BUILDERS' ASSOCIATION.—The annual dinner of the members of the Weston-super-Mare Master Builders' Association was held recently at Glass's Restaurant. The chair was occupied by the President of the Association, Mr. Charles Addicott, and the vice-chair by Mr. G. Stokes (Vice-President of the Association). The loyal and patriotic toasts having been honoured, Mr. W. Dyer proposed the toast of "Architects and Surveyors." They had architects in the town who were at all times ready to meet the builders in a reasonable way, as far as they could—always keeping their clients' interests in view. They tried to do the best they could for their clients without injuring the builders, and *vice versâ*.—Mr. W. Jane, in reply, said he had his doubts occasionally as to whether architects were not sometimes considered by the general public and by the builders as necessary evils, and by some as an unnecessary luxury. However, he supposed they did form a useful buffer sometimes, by taking the hard knocks of conflicting interests upon themselves.—Mr. E. T. Gillmore also responded.—Dr. Grey then proposed the toast of "The President and Vice-President of the Weston-super-Mare Master Builders' Association." If there were not such an Association what a state of things they would have! There would be a continual series of hostilities, which were now happily avoided; there would be no organised body to deal with matters affecting their trade; there would be no master man at the helm to prevent their interests going on the rocks, because their's was a trade which, from time to time, had difficulties to contend with. It had public authorities to deal with, and it required men of some considerable skill and strategy to govern its policy. Bad building could only produce bad results in the way of the diminished prosperity of the town. A health resort like Weston depended entirely for its prosperity upon its bill of health, and its bill of health depended very largely upon the builder.—The Chairman, in responding, said their business was to try, as far as it lay in their power, to keep the trade together. Building was the staple trade of the town, and if it were prosperous, other branches of trade must derive some benefit. He was sorry

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to say that just at present trade was bad, but it was not only locally that it was bad, for he heard from commercial gentlemen that the same state of things prevailed nearly throughout the land.—Mr. Gilbert Stokes also replied. Other toasts followed.

MANCHESTER SHIP CANAL.—The directors have deposited a bill to authorise the company to raise the level of the water in the tidal section and to deepen the upper reaches of the Ship Canal, and to construct a diversion of the river Mersey at Warrington with a lock and sluices. A bill has been deposited by the Trafford Park Estates Ltd. and their directors, acting as promoters, the object of which is to obtain powers to construct a dock and wharves in Trafford Park, and to work them as a public dock estate. The directors consider that such powers would be injurious to the interests of the company, and they are taking steps to vigorously oppose the bill. The engineer's report for the half-year ending December 31, 1903, states that the depth of water in the Ship Canal and Docks has been fully maintained throughout the entire length of the waterway by means of the dredging operations. The deepening of the approach channel below the locks at Eastham has been completed; the timberwork of the leading jetty at the inner end of Eastham locks is well advanced towards completion; and the work required for the construction of the spare steel gates for the upper end of the 80 ft. lock is in hand. Mooring dolphins, intended for the use of vessels desiring to tie up, are in course of construction below Latchford locks. The works required for the extension of the coaling basin at Partington, and of the railways and sidings in connexion therewith, have been completed. The leading jetty at the upper end of the 65 ft. lock at Barton has been completed. A new berth, with railway connexions and sidings, is being constructed on the northerly side of the Canal at Weaste, for the accommodation of the coal traffic which is at present carried on at Salford Quay. The large group of railway sidings on the southerly side of the new dock now in course of construction has been completed. Considerable additions have been made to the timber storage ground and to the roads and railways round the docks. The embankments and slopes of the canal are generally in good condition, and the works throughout have been efficiently maintained. The works in connexion with the new dock on the site of the old racecourse, and with the transit sheds on the southerly side thereof, which are being carried out by Mr. Henry Lovatt and others, under contract with the Manchester Dock and Warehouse Extension Company, have made good progress during the half-year.

WAR MEMORIAL, LIVERPOOL.—The memorial to the members of the Liverpool Regiment who fell in the South African war, which is being executed by Mr. Goscombe John, will stand 25 ft. in height, and will have a width of the same length. The main parts of the sculpture consists in two figures of soldiers supporting a panel, on which the names of the fallen will be inscribed, and the figure of Britannia, with which the memorial is surmounted.

A RESERVOIR COLOURING BRUSH.—This, which is called in the description sent to us "reservoir colouring pen," is more intelligibly described as a colouring brush, though it fills some of the uses of a broad pen. It consists of a brush connected with, and filled from, a compressible reservoir, the action of which serves both to draw up the colour and to fill the brush again when required. The brush is clipped between two thin sheets of metal, which can be separated or brought together by a screw, so as to produce a broader or narrower brush as required, and to maintain the brush line at the same width during use. We thus have a brush available for drawing broad lines of colour of uniform width, and which can be used either with free hand or against a ruler. Such an implement can be useful in many ways—in outline colouring to maps or plans, in drawing full size mouldings, or giving a section colour to them when drawn; in making diagrams on a large scale, etc. The brush is the patent of H. G. Lloyd, and is made by Messrs. Van Neck and Co.

PORTSMOUTH MASTER BUILDERS' ASSOCIATION.—The thirty-first meeting of the Portsmouth Master Builders' Association was held at the Sussex Hotel recently, Mr. W. W. Evans presiding. The annual report and balance-sheet, having been read, was adopted. Mr. J. W. Perkins proposed the re-election of Mr. W. W. Evans as President. He said that the Association's thanks were due to Mr. Evans for the able way in which he had arranged the many difficult questions which came before him during the past year. Mr. Light having seconded, the resolution was carried *nem. con.* The President thanked the members for their confidence. Mr. A. Sprigings was then elected Vice-President, and Mr. Jones as Treasurer. The following were elected as Committee:—Messrs. G. J. Davis, Salter, J. Crockerell, Light, C. Dye, H. G. Wilkins, G. R. Chamberlain, and J. W. Perkins. Mr. Frank J. Privett, who had been Secretary for the past few years, was unable to offer himself for re-election. The President proposed a hearty vote of thanks to him for the great assistance he had always given them, and expressed regret at losing his services. Mr. Perkins, in seconding, expressed his pleasure that Mr. Privett was about to become a member of the Association, and, several members having supported, the resolution was carried unanimously. Mr. F. B. Roskell was elected Secretary, and the following as new members:—Messrs. D. Gammins, Frank J. Privett, J. Timpson, and E. J. Hoile.

NORTH STAFFORDSHIRE BUILDERS' ASSOCIATION.—Under the chairmanship of the President, Mr. J. Gallimore, J.P., the annual dinner of the N.S. Builders' Association was held recently at the North Stafford Hotel, Stoke. Mr. A. E. Tallis, secretary of the Midland Centre of the National Federation of Building Trade Employers of Great Britain and Ireland, proposed the toast of "The North Staffordshire Builders' Association." Mr. John Bagnall proposed "The Local Governing Bodies." Mr. James Heath (Leek) submitted "The Architects and Surveyors." He said that the aims of an architect must be very high, and in that district they were most fortunate, for they had men of considerable eminence. One might sympathise with the architects that they had not a more genial atmosphere to work in, otherwise the beauty of their accomplishments would be more apparent. The system of estimating was probably responsible sometimes for work which did not produce the best architectural effects, but this could not be helped. Mr. Alexander Scrivener, who responded, said that architects were placed in a very awkward position, having to exercise a judicial capacity as regarded their contracts. They had, on the one hand, to see that justice was done to their clients, and, on the other, that the builders had their rights. Mr. Heath struck rather a high note when he suggested that the architects might do better than choose the lowest tender, but it was not the architects who did it; it was the proprietor. It might be expected that he should say something about a circular which had been sent to architects as regarded contracts. Unfortunately, architects were placed in a much worse position than the builders. The latter had an excellent association, which enabled them to meet together and devise all sorts of schemes for kicking the architects. The architects were not in the same position. As architects they never met together, and there were one or two members of the profession in that room whom he did not even know. The position of the architect, unfortunately, was always insular. He always worked for himself, and by himself; they never co-operated as they ought to do. For many years past he had felt that the architects of the district ought to be associated, but they did not know who was to take the initiative. As regarded "quantities," which seemed to be a serious point in connexion with the contract, his firm were prepared—and in their last contract they had embodied it—to make the quantities part of the contract, and to adopt absolutely what the builders suggested, *i.e.*, that, if any error should be found in any of the quantities, if it were no fault of the builders in carrying out or in pricing, it should be corrected. Such errors would not vitiate the contract, but would be dealt with in the ordinary way and added to, or deducted from, as the case might be. He was bound, however, to say that, so far as his own firm's work was concerned, he thought it would be worse for the builder than for the proprietor, for they had had very few discrepancies pointed out in their quantities by the builder. They never looked into the quantities on their own part, or on their clients'. If they did do, he thought they would find that they must carry out the clause to its fullest extent, and take something off the builders, rather than let the latter put something on. Further, his firm had been prepared for many years past to consider any error in their quantities, if a builder pointed it out, and they were now putting that clause into their quantities for the future. The toast of "The Visitors" was proposed by Mr. H. Howlett, and acknowledged by Mr. A. Boulton.

FATAL BUILDING ACCIDENT.—At Westminster, on the 15th inst., an inquest was held on Henry George Cressy, aged 52, a labourer, lately living at Queen's-road, Battersea. On Friday last week, twelve pieces of timber, each about 22 ft. long and weighing 82 lb., were being hoisted some 70 ft. high at the new Gaiety Restaurant buildings. One of the pieces slipped from the sling attached to the crane, and fell, striking Cressy, inflicting injuries which caused death. James Mackintosh, the foreman, said there were from 120 to 150 men employed there. The timber would not pass over Cressy as it was being hoisted, but it was a windy day, and the timber must have been blown in his direction. A verdict of "Accidental death" was returned.

BARNSLEY FEDERATION OF BUILDING TRADE EMPLOYERS.—About fifty members of the Barnsley Federation of Building Trade Employers dined, on the 12th inst., at the Royal Hotel, Barnsley, the President, Mr. James Smith, presiding. In proposing "The National and Yorkshire Federations," Mr. G. Porter alluded to a scheme for the establishment of a building trades conciliation board. The necessity for a closer union between men and employers had been felt for some period, and the scheme now before the Yorkshire Federation was that an equal number of men and employers should form such a board. The matter was one that had received great attention, principally on account of the large number of trumped-up strikes that had taken place throughout the country, and he had hopes for its successful inauguration. The speaker referred to the fact that the financial position of the Yorkshire Federation was far better than it had ever been. Mr. E. Good responded. Referring to the labour question, he said that if their line of action was right, they should tell a man straight that he was wrong; not tell him that he was right and then tell his neighbours that he was wrong. If they could waken up to more straightforwardness on the part both of masters and men, it would be the greatest lever for bringing about a closer union between them. Councillor W. G. England also responded. Mr. J. H. Taylor, C.E., proposed "The Barnsley Federation of Building Trade Employés." The President and Mr. H. Medley responded, and Mr. T. Lindley followed with the "Mayor and Corporation of Barnsley," to which the Mayor responded.

QUEEN VICTORIA MEMORIAL SCHOOL, SCOTLAND.—The Executive Committee of the Queen Victoria Memorial School for the Sons of Scottish Sailors and Soldiers have decided, instead of acquiring any existing building, to accept the offer of a site which lies upon the property of Mr. Stirling, of Kippendavie, about four miles distant from Dunblane, and to obtain plans and estimates accordingly. Sir Rowand Anderson is a member of the Committee.

CAPITAL AND LABOUR.

MASONS' STRIKE AT SOUTHPORT.—A masons' strike has taken place in connexion with the erection of Holy Trinity Church, Southport. The reason assigned is that the stone is cut, etc., at the Bath quarries, from which it *is* taken, instead of on the job. Accordingly the men have been withdrawn by their Society. At Bath, the men, it is understood, are paid at the rate of 7d. per hour, whereas the rate in Southport is 9d. The President of the Southport Trades Council, at the annual meeting, said it was a very serious matter for Southport. A rule had been in force twelve years that no stone of a certain dimension should come into the town, but such stone had come. The committee of Holy Trinity Church had accepted the tender from a man outside the town, and he came into Southport, cut out the local employers re labour, and sent work into a low-paying district and got it put up in Southport, in violation of a rule. The stonemasons could not help it, and had to leave their work. A deputation was appointed from the Trades Council to join a deputation from the Stonemasons' Union, to see the committee of the church with a view to getting the grievance remedied.

Legal.

RELAYING A DRAIN.—TENANT'S LIABILITY.

THE case of Stockdale *v.* Ascherberg came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, last week, on the appeal of the defendant from a judgment of Mr. Justice Wright in the King's Bench Division.

In this case the plaintiff had let to the defendant, under an agreement in writing, a tenancy of No. 68, Brondesbury-villas, Kilburn, for the term of three years, at an annual rent of 55*l.* By the agreement, the defendant agreed "to pay all taxes, rates, assessments, and outgoings of every description for the time being payable in respect of the premises as they become due (landlord's property tax only excepted)." The defendant also agreed "to keep and leave the premises (including the fixtures) in as good condition as they are now in (reasonable wear and tear excepted)," and "to keep the gutters, stack pipes, water-closets, and cisterns clean, and to keep in repair all sash lines and internal pipes and taps." In September, 1902, the plaintiff was served with notice by the Urban District Council of Willesden, under the Public Health Act, 1875, which stated that there was a

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nuisance on the premises, and that the plaintiff must abate it by taking up and relaying the existing drain. The plaintiff did this, at a cost of 83*l.* 10s., and brought the present action to recover the amount from the defendant under the agreement. Mr. Justice Wright held that the defendant was liable, and gave judgment for the plaintiff for the amount claimed—hence the present appeal of the defendant.

Mr. Edgar Foà appeared for the appellant, and Mr. G. F. Hohler for the respondent.

The Master of the Rolls, without calling upon counsel for the respondent, in giving judgment, said that though they felt great sympathy with the defendant, the question they had to decide was whether or not the defendant was bound by his contract to accept this burden. He thought it had been clearly established that the word "outgoings" in the covenant covered this particular class of expenditure. The order to alter the system of drainage was, no doubt, a very drastic one, but, having regard to the condition of the premises at the time of the contract, it was impossible to say that it was outside the contemplation of the parties that the Sanitary Authority might not make such an order. It was impossible to say that it was unreasonable to suppose that the defendant undertook this responsibility in view of the fact that the plaintiff and the defendant had come to an agreement in perfectly clear and unambiguous terms, by which the tenant agreed to pay all "outgoings," His Lordship thought it would be straining the language if the Court acceded to the argument on behalf of the defendant.

The Lords Justices concurred, and the appeal was accordingly dismissed with costs.

ACTION TO ENFORCE A CHARGE OF PAVING EXPENSES.

THE case of the Mayor, etc., of West Bromwich *v.* Owen came before Mr. Justice Buckly in the Chancery Division on the 11th inst., an action by the plaintiffs against the defendant to enforce a charge for paving, etc., under the Public Health Act, 1875.

Mr. Buckmaster, K.C., and Mr. Guy Lushington were counsel for the plaintiffs; and Mr. Frank Dodd for the defendant.

Mr. Buckmaster, in opening the case, said each step in regard to the apportionment of the road had been complied with, and the plaintiffs had served the notices on the persons who were the owners of the property abutting thereon within the meaning of the Act.

His Lordship asked what the defence was.

Mr. Dodd said that the plaintiffs asked for a charge on the property. The defendant was only the owner of the equity of redemption. There were mortgagees, and they ought to have been served with notice by the plaintiffs. He submitted that under the 257th section of the Act all the notices had not been served.

Mr. Buckmaster said the facts of the case were these:—There were certain houses in a road called Poplar-avenue, Nos. 2 to 26, even numbers, and No. 55, Legg-street. The plans for making this road were deposited on March 26, 1896, with the local authority. On February 15, 1899, a notice was served on the then owner of this property, Mr. George Walker, requiring him to do certain work to the road, such as levelling, etc. The owner did not do the work, and the plaintiffs did it in default. On September 28, 1899, the works were completed, the total cost being 364*l.* On June 26, 1900, the amount was apportioned, and the amount apportioned in respect of the property in question was 128*l.* Notice of apportionment was given to the defendant on April 23, 1901, and as no dispute had arisen it was binding, and could not be disputed now. On November 28, 1901, a demand was made for payment, and this was now admitted. The only one thing further to prove was that when the plaintiffs served the notice of apportionment the defendant was the owner.

Mr. Dodd said that the defendant was not the owner on April 23, 1901.

His Lordship: What is the point?

Mr. Dodd: The point between us is whether the service on me is compliance with the Act, and whether it should not have been service on the owner at the time the works were completed.

Mr. Buckmaster said he wanted to have the defendant's interest in the property bound by the charge. He was in receipt of the rack-rent. He did not ask for a personal charge.

Mr. Dodd said the 257th section was the only section which gave the charge on the premises, and only applied in all cases where a local authority had incurred expenses in respect of which the owner was made liable under the Act. When they came to that the only section to be relied upon was the 150th, and the owner was not liable under that until he had made default. There must be a default by the person sued, and that was not the case here.

In the result, His Lordship made an order in favour of the plaintiffs in the usual form, declaring that there was a charge, and calling for an inquiry to see who the owners were. He ordered the defendant to pay the costs of the action, so far as they exceeded the costs that would have been incurred if an originating summons had been issued.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

2,065 of 1903.—H. H. OWEN and A. C. GOOD: *Boiler Heater and Fuel Economiser for use in Domestic and other Fireplaces and Furnaces.*

This invention consists of a bar of fireclay or other approved refractory material, which forms the upper part of a hot chamber, the sides or legs of such chamber being formed of two independent pieces of cast iron. The special feature of the article is, that by being moulded in the thickness of the material so that the aperture of the economiser is narrower in the front than the back portion, when placed in position in the firebox of range or furnace in front of a boiler, the recessed portion forms a hot air chamber, thereby intensifying the heat of the fire and increasing the rapidity of heating the water in the boiler with less consumption of fuel than would otherwise be the case.

2,080 of 1903.—J. P. GUY: *Edge-runner Grinding Mills or Mortar Mills, or other Grinding Mills.*

Edge-runner grinding mills or mortar mills, or the like grinding mills, consisting in the arrangement and combination therewith of a series of apertures in the side wall of the pan, and one or more auxiliary rollers and one or more spring scrapers adapted to act in conjunction with said perforated side wall of the pan on the material under treatment in said pan.

2,127 of 1903.—R. PALMER: *Tiles, Slabs, or Plates for Walls, Ceilings, and for use in the Construction and Decoration of Buildings generally.*

Tiles, slabs, or plates formed out of sheet metal, or other suitable material, and with one or both sides turned up to form a flange, or flanges, said flanges being perforated to form a locking device for mortar or cement.

2,421 of 1903.—A. H. MAURICE and H. G. J. BARROW: *Picks, Sockets, and Helves, and the Method of Attaching Sockets to Helves.*

This invention relates to a method of combining a movable pick head and a socket with a helve, the socket being attached to the helve without the use of pin, rivet, screw, or such like attachment.

5,216 of 1903.—J. GOODARE and J. B. GOODARE: *Locks.*

Locks and latches characterised by a spring actuated trigger bolt, which engages with and retains the ordinary bolt when drawn back, and has a projection through the face plate which, upon meeting the staple or catch plate, simultaneously releases the bolt, which then shoots into the staple.

5,383 of 1903.—G. HAYES: *Windows and Window Sashes and Frames.*

This consists in the combination of an outer fixed frame, shouldered at each side with an overlap along its sill, and a lengthwise overlap in or along the under face of its top rail; an inner frame, fitted swinging within the outer frame, and shouldered at each side in correspondence therewith, and having vertical lengthwise passages through its top and bottom rails, in correspondence with vertical grooves in its sides; a lower sash, fitted sliding in the front of said grooves of the inner frame, and adapted to pass beyond and through the bottom passage thereof to a junction with the overlapping sill of the outer frame, and an upper sash, fitted sliding in the rear side grooves of the inner frame, and adapted to pass beyond and upward through the top passage thereof to a junction with the overlap-provided top rail of the outer frame.

5,453 of 1903.—J. AYERS and A. T. AYERS: *Adjustable Sofa Ends, Chair Backs, and the like.*

A fitting for the purpose of holding the head or end of a settee, sofa, chair, or other article of furniture in any given position or at any required angle, consisting of one or more sliding bars, having ratchet teeth suitably cut on one edge, which are engaged by a detent lever held by a spring, which may be pivotted on and form part of another sliding bar.

5,594 of 1903.—H. H. LAKE (Chemisch-Technische Fabrik): *A Process for Colouring and Hardening Natural Stone, also applicable to Organic Material, such as Ivory, or the like.*

A process for colouring natural crystalline compact stones, especially natural marble or organic materials such as ivory, consisting in first freeing the stone or other material from air, then forcing colouring solutions by pressure therein, and finally evaporating the solvents.

5,611 of 1903.—A. GILES, F. C. GILES, and A. C. HOWELL: *Casement Stays and Window-blind Cord Rack Pulleys.*

A casement stay, the combination and employment with the stay proper of a gripping device, consisting essentially of a spring, made by bending a piece of strip or sheet metal, or other metal, to form two outwardly projecting spring limbs through holes in which the stay proper passes, said spring limbs being so shaped and arranged that when they are squeezed towards each other their angles with the stay become less acute, and the stay is free to slide through them, but when the limbs are released they spring apart and the stay is gripped in the holes in the limbs.

6,022 of 1903.—W. MOTTERSHALL: *Smoke Extracting Apparatus for Chimneys, applicable also for Ventilating.*

A smoke extracting apparatus, consisting of a horizontal tube forming part of, or attached to, or supported by or in, a vertical revolvable tube, the said horizontal tube being parallel or partly parallel and partly conical or doubly conical, and having located in the interior of one end a conical tube, open at one end to the outer atmosphere, and at the other end to the interior of the horizontal tube and a vane located on the horizontal tube.

6,465 of 1903.—R. HODGES and J. H. WATSON: *Indicating Bolts or Latches for Lavatories.*

Indicating bolts or latches for doors, consisting in the combination with a bolt or like part and a pivottal handle or finger piece of a cam, operated by the angular movement of the said handle or finger piece, and adapted to impart a sliding movement to the said bolt or like part.

7,232 of 1903.—A. SOWDEN (M. Sowden): *Apparatus for Humidifying Air.*

This invention relates to an apparatus designed for humidifying the atmosphere of weaving sheds, spinning sheds, and other rooms and buildings. The invention consists of a tube of woven material, which is saturated with water and then placed in such a position that a stream of air passes through, and the draught distributes the moisture. According to this invention, a tube or funnel is employed, made of cloth or woven textile fabric, which is lowered into a vat of water, or otherwise saturated, and then raised into position wherever required, and acting as a chimney or ventilator; a current of air, preferably from the outside of the building, passes through the tube, and the draught causes a dispersal of the moisture contained in the tube, the moisture being driven off in the form of a very fine spray, and thus ensures humidification.

10,733 of 1903.—W. G. BEHENNA: *A Safety Fire Curtain.*

The object of this invention is to provide a curtain to be attached to fire grates or mantelpieces for protection from fire. The curtain is fixed on a roller on the inside top part of the grate, the grate having a slot cut to allow the curtain to pass through and down a groove on each side of the grate. The curtain is fixed on a spring roller, which can be partially or fully lowered or raised as desired, and, being composed of non-inflammable material, when lowered prevents cinders or burning coals from falling on to the floor, thereby preventing all possibility of danger to the room from fire.

9,637 of 1903.—W. MAWLAM and S. R. HINGLEY: *Means for Suspending Sliding Window Sashes and the like.*

This invention is applicable to sliding windows and the like. In carrying out this invention a metallic bracket is used, with a spring and pulley attached, which is fastened to the sash frame, and the pulley rotates on to a metallic corrugated rack, which is fastened on the window frame. The sash frame can be raised and lowered, and will stop in any position required. The bracket or the rack can be fastened either to the sash frame or to the window frame, as the case may be.

22,264 of 1903.—B. COHEN AND SONS, LTD., and W. RUTTER: *Knock Down or Folding Furniture.*

According to this invention a series of fasteners is employed, provided with screw shanks and laterally projecting heads, the said fasteners being applied to one section of the furniture so that the heads are some little distance away from the surface thereof; in the adjacent part

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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of another section a recess is formed, which is covered by a metal plate having in it a slot into which the head of the fastener can be inserted in such manner that when the two parts are moved slightly relatively with each other the head thereon will engage with the metal plate and so form the necessary lock. In some cases the screwed shank is made of sufficient length to permit of the head, when the fastener is fixed to one part of the furniture, being passed entirely through a slot in the adjacent section, so that it projects beyond the surface thereof, the shank being then turned to place the head of the fastener out of coincidence with the slot.

26,350 of 1903.—J. COSSMANN: *Daylight Reflectors.*

A daylight reflector, comprising a plurality of reflecting plates revolvubly journalled above each other, and provided with pintles, bars adjustably secured to the sides of the bay of the window and provided with oblong slots for the reception of said pintles, fingers secured to one of the pintles of each reflecting plate, and means connecting said fingers for simultaneously rotating said reflecting plates.

751 of 1903.—J. B. DAVIES: *Nail or Screw for Securing Corrugated Iron.*

A nail or screw having a soft metal bearing part or surface under the solid head, secured by being made to overlap the periphery of the head when covering the head, and by fitting above projections on or into indentations formed in the shank of the plank nail, such projections being either left as existing before attachment of soft metal part, or forced upward during attachment of said soft metal part.

5,533 of 1903.—T. GREEN: *Apparatus for Washing and Cleansing Air or Smoke, also for General Ventilating Purposes, and for Disinfecting or Perfuming.*

An apparatus for ventilating, cleansing, disinfecting, and perfuming buildings, as also for washing smoke, consisting in the combination with the chamber of inlet and outlet pipes, the latter provided with disinfecting or perfuming means, an outer pan or chamber forming a water seal, horizontally disposed turbine and fan provided with pockets, and water jets provided with delivery nozzles for driving the turbine.

5,876 of 1903.—J. SMART: *Method of Asphalting Bridges, Viaducts, Roofs, Damp Courses, and the Manufacture of Slabs for such purpose.*

A method of asphalting bridges, viaducts, roofs, damp courses, and the like, consisting of first coating the ground or surface with asphalt and then applying sheets of perforated metal, covering same with asphalt, then covering with other sheets of perforated metal, and covering same with more asphalt, and the whole being amalgamated and bonded together when set.

5,917 of 1903.—A. FAULKES: *Paving Flooring and the like.*

A new device in pavement for streets, shops, warehouses, dwelling houses, stairs, and landings, composed of lime or cement concrete or mineral asphalt into which wood, stone, metal, asphalt, composite, or concrete blocks are inserted. The paving made up in separate blocks, or laid *in situ* over any area.

6,153 of 1903.—S. WRIGHT: *Blocks for the Erection of Fireproof Partitions.*

Blocks for the erection of fireproof partitions composed of plaster of Paris or Portland or other cements, with an admixture of cocoanut or coke breeze, stone ballast, granite, or other similar material, with a square sinking on each end.

6,596 of 1903.—R. MAIN: *Rolled Iron and Steel Joists or Girders.*

A girder of H section composed of two parts or sections, each rolled of T section, and having a half-check formed in the web in such wise that when the web parts are placed together they overlap, the said overlapping web parts being rivetted together so that the lines of rivetting are approximately along the neutral axis or mid-depth of the girder.

7,203 of 1903.—T. HILLMER: *Bore Hole Plummet or Deviation Recorder.*

A bore hole plummet comprising a cylinder adapted to be lowered into the bore hole to be examined, such cylinder having a plummet needle within its interior adapted to mark its position on a disc if a relative movement occurs between the needle point and the cylinder, or part thereof.

7,373 of 1903.—A. KENDRICK: *Devices for Making Branch Connexions to a Range of Pipes for Draining and other purposes.*

A device for facilitating the connexion of branch auxiliary pipes to a range of flanged pipes, consisting of a ring which is adapted to be interposed between two adjacent flanges in the range of pipes, and make fluid-tight joints therewith, such ring having a passage from the interior to the exterior, the external end of which is adapted to make fluid-tight connexion with a branch auxiliary pipe.

13,455 of 1903.—O. BERTAZZOLI and B. GAZZANO: *Securing or Fastening Sheets or Plates of Suitable Material over Surfaces such as Floors, Ships' Decks, Bridges, and the like, and Rivets therefor.*

In fastening together sheets or plates of suitable material over surfaces, particularly such as the metal bridges of ships, consisting in rivetting a covering strip or strips of such material, or rivetting the overlapping parts by means of rivets, the shanks of which are partly hollow, and are provided at the end opposite the head with a flared plug, which rests upon the surface to be covered, so that when the rivet is hammered the shank is caused to spread out in accordance with the profile of the plug, forming a rivetted joint.

26,910 of 1903.—F. A. HEADSON: *Pipe Cutting Tools.*

A pipe cutting tool, consisting in the combination of a frame portion provided with a jaw having a plurality of bearing points, a sliding block mounted on such frame provided with roller mechanism, a cutting tool provided with a cutting point mounted between the axial centre of such roller mechanism and the bearing points of the jaw, and means for moving such cutting tool independently of the sliding block and roller mechanism.

27,165 of 1903.—E. TIETZCH: *Locks, Bolts for Doors, and the like.*

A bolt for house doors and the like, characterised by its being shot back by the key on opening the door, and on closing the door shoots automatically into place.

27,588 of 1903.—E. G. ABELL: *Holder for Window Sashes.*

A window holder consisting in the combination with a pair of window sashes and jambs, of a holder pivotted to the jamb centrally or above or below the meeting rails of said sashes, and having pivot eye or loop ends to suit similar eye plates or pins or bolts affixed to styles of top and bottom sashes.

27,784 of 1903.—R. M. SOMERS: *Boilers for Kitchen Ranges.*

A boiler for kitchen ranges, composed of a main boiler permanently set with the range, and an auxiliary boiler placed at the front of the main boiler and removably connected therewith.

27,928 of 1903.—N. FARNHAM: *Waterproofing of Bricks, Stone, and the like Porous Materials.*

A method of waterproofing and finishing the surface of stone, brick, and other porous material by heating the porous material, and, while heated, applying a waterproof compound to the heated surface and subsequently hardening the surplus of the compound and removing it from the surface by a blast of sand and air.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 2.—By HY. SPENCER & SONS (at Gainsborough).

Hemswell, Lincs.—Freehold house and 1 a. 1 r. 21 p.	£421
Three freehold closes, 8 a. 0 r. 7 p.	507
Snitterby, Lincs.—Freehold farm buildings and 28 a. 3 r. 19 p.	1,000

February 4.—By NORMAN & SON (at Uxbridge).

Hillingdon, Middx.—Villier-st., "The Canteen" b.h., f., y.r. 36*l*	925
2 to 13, Villier-st., f., y r. 162*l*	1,475
Colham Green, 13 freehold cottages, w.r. 149*l*. 10s.	1,400
Pole-hill, three freehold building plots	350
Uxbridge, Middx.—10 to 14, Bennett's-yd., f., w.r. 61*l*. 2s.	645
1, 2, and 3, Crown and Sceptre-yd., f., w.r. 23*l*. 8s.	130
Bridge-rd., a freehold building plot	180

February 6.—By WILLSON & PHILLIPS (at Southend).

Westcliff-on-Sea, Essex. — Sea View estate, main-rd., a freehold house and shop, y.r. 30*l*.	400

February 8.—NIGHTINGALE, PHILLIPS & PAGE.

Fulham.—Waterford-rd., f.g. rents 18*l*., reversion in 55½ yrs.	520
Surbiton.—4, Brighton-rd. (S), f., y.r. 35*l*.	510
Twickenham.—21 and 23, Orleans-rd., f., w.r. 33*l*. 16s.	335

By IZARD & IZARD.

St. George's East.—74, 75 and 76, St. George-st. (S), with yards and workshops, part freehold and part u.t. 44 yrs., g.r. 25*l*., e.r. 286*l*	2,250

February 9.—By SIMMONDS & MOORE (at Richmond).

Teddington.—11, Cambridge-rd., u.t. 965 yrs., g.r. 6*l*., e.r. 42*l*	360

February 10.—By BAXTER, PAYNE & LEPPER.

West Wickham, Kent.— Grosvenor-rd., f.g. rents 60*l*., reversion in 77 yrs.	1,400

By MULLET, BOOKER & CO.

Hyde Park.—147, Gloucester-ter., u.t. 38¼ yrs., g.r. 18*l*., p.	1,310

By THURGOOD & MARTIN.

Hanover Square.—18, George-st. (S), area 1,536 ft., f., y.r. 260*l*.	11,100
Hackney.— Blackstone-rd., f.g. rents 30*l*., reversion in 43¼ yrs.	820
Westbourne Park.—Aldridge-rd. villas, l.g. rents 81*l*., u.t. 52¼ yrs., g.r. nil	1,620

By DOUGLAS YOUNG & CO.

South Lambeth.—219, South Lambeth-rd., u.t. 61¾ yrs., g.r. 12*l*., e.r. 65*l*.	700
Clapham. — Triangle-pl., f.g. rents 21*l*., reversion in 43 yrs.	550
Battersea.—38, Comyn-rd., u.t. 80 yrs., g.r. 8*l*. 8s., y.r. 45*l*.	450
Wandsworth.—32 and 34, Atheldene-rd., u.t. 93 yrs., g.r. 11*l*., w.r. 67*l*. 12s.	400
Brockley.—71, Brockley-rd. (S), u.t. 60 yrs., g.r. 5*l*., y.r. 40*l*.	380

February 11.—By CHESTERTON & SONS.

Kensington.—4, Cluny-mews, u.t. 71½ yrs., g.r. 8*l*., y.r. 45*l*.	450

By WHEELER & SON.

Ealing.—8, St. Leonard's-rd., u.t. 83 yrs., g.r. 10*l*., p.	755

By THOMAS SHARP.

East Ham.—11, 13, 41, 63, 71, 73, 75 and 77, Compton-av., f., w.r. 223*l*. 12s.	2,040
43, 53, and 57, Barking-rd. (S), f., y.r. 155*l*.	1,845

By STIMSON & Sons.

Old Kent Road.—No. 519, f., y.r. 34*l*.	700
Camberwell.—17, Caspian-st., f., w.r. 36*l*. 8s.	400
Catford.—Scrooby-st., f.g.r. 22*l*., reversion in 83¼ yrs.	495
Hackney.—Southborough-rd., l.g. rents 20*l*. 5s., u.t. 38¼ yrs., g.r. 4*l*.	250
Clapham.—53, Fentiman-rd., u.t. 24½ yrs., g.r. 7*l*. 10s., e.r. 48*l*.	250
Brixton.—84, 86, 94, 96, 98, 102, and 104, Dalberg-rd., u.t. 70 yrs., g.r. 46*l*. 7s., y.r. 255*l*.	2,390
Lambeth.—17 to 27 (odd), Stangate-st., u.t. 39¼ yrs., g.r. nil, y.r. 222*l*. 14s.	1,890
56, Oakley-st., f., w.r. 46*l*. 16s.	450
Bermondsey.—Grange-rd., f.g.r. 6*l*., reversion in 21 yrs.	350
Camberwell.—Waterloo-st., f.g.r. 6*l*. 6s., reversion in 68½ yrs.	165

By EDWIN EVANS (at Battersea).

Wandsworth.—47 to 75 (odd), and 79, Trentham-st.; and 35, Lonsdale-ter., u.t. 96½ yrs., g.r. 89*l*. 5s., w.r. 530*l*. 8s. (in one lot)	3,255
5, Hugon-rd., u.t. 75 yrs., g.r. 4*l*., w.r. 28*l*. 12s.	240
9 and 11, Chatto-rd., u.t. 80 yrs., g.r. 12*l*., w.r. 76*l*. 14s.	610
Battersea.—5, 7 and 9, Currie-rd., u.t. 70 yrs., g.r. 12*l*. 12s., w.r. 101*l*. 8s.	750
89, Harbut-rd., u.t. 75 yrs., g.r. 6*l*. 15s., w.r. 44*l*. 4s.	395
126, Usk-rd., u.t. 47½ yrs., g.r. 2*l*., w.r. 23*l*. 8s.	160
21 to 27 (odd), Savona-st., u.t. 31 yrs., g.r. 8*l*., w.r. 106*l*. 12s.	395
69, Wye-st., f., w.r. 33*l*. 16s.	295
Clapham.—76, North-st., u.t. 66½ yrs., g.r. 5*l*. 12s. 6d., e.r. 36*l*.	343
Kensington.—8, Bolingbrooke-rd., u.t. 82 yrs., g.r. 12*l*., y.r. 50*l*.	550

By ROBERT NEWMAN (at Uxbridge).

Sipson, Middx.—Harlington-rd., "Hollycroft" and 2½ acres, f., y.r. 70*l*.	1,200
Harlington-rd., freehold fruit plantation, 7 a. 0 r. 5 p., y.r. 75*l*.	1,555
Chitterfield-gate, "Scroogeall" fruit plantation, 2 a. 2 r. 36 p., f., y.r. 30*l*.	780
Chitterfield Gate, market garden and fruit land, 4 a. 2 r. 16 p., f., y.r. 25*l*.	235
Harmondsworth, Middx.—Heathrow, freehold fruit plantation, 9 a. 3 r. 4 p., y.r. 40*l*.	720

February 12.—By W. A. BLAKEMORE.

Ealing. — Windmill-la., a freehold building estate, area 5 acres	3,000

By G. A. WILKINSON & SON.

New Bond Street.—11, Conduit-st. (S), area 2,335 ft., corporation lease, g.r. 25*l*. 1s. 1½d., y.r. 520*l*.	14,000
Southwark.—29, 30 and 31, Emerson-st., f., w.r. 109*l*. 4s.	1,220
Westminster.—31, 32 and 33, Medway-st., f., w.r. 98*l*. 16s.	1,450
Kensington.—112, North End-rd. (S), 1 to 4, Ebenezer-cottages, and land adjoining, area 13,000 ft., f., y.r. 166*l*. 12s.	2,850
Fulham.—112a, 114 to 126 (even), North End-rd., f., w.r. 232*l*. 14s.	4,380
126, North End-rd. (S), f., y.r. 60*l*.	1,210
130 to 136 (even), North End-rd. (S), c., y.r. 202*l*.	2,545
Lanfrey-pl. yd., workshop, &c., f., p.	170
Lanfrey-pl. stabling and coach-house, c., w.r. 28*l*. 12s.	225
1 to 23 (odd), Lanfrey-pl., c., w.r. 254*l*. 16s.	2,695
2 to 12 (even), Lanfrey-pl., f., w.r. 153*l*. 8s.	1,815
35, Lanfrey-pl., c., w.r. 23*l*. 8s.	260
Kensington.—39 and 41, North End-rd. (S), c., y.r. 115*l*.	1,970
43 and 45, North End-rd., c., y.r. 95*l*.	1,870
4 to 16 (even), Portland-st., c., y.r. 235*l*. 15s.	2,190
Notting Hill.—1, 3 and 5, Latimer-rd., f., w.r. 81*l*. 18s.	755
7 and 9, Latimer-rd. (S), f., w.r. 59*l*. 16s.	560

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r or leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

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MEETINGS.

FRIDAY, FEBRUARY 19.

Architectural Association. — Mr. W. H. White on "Corner Houses." 7.30 p.m.

Institution of Mechanical Engineers.—Fifty-Seventh Annual General Meeting. The annual report of the council will be presented, and the results of the ballot for the annual election of the president, vice-presidents, and members of council will be announced. The discussion on "Heat Treatment of Steel" will then be continued and concluded, after which a paper on "The Motion of Gases in Pipes, and the Use of Gauges to Determine the Delivery," will be read by Mr. Richard Threlfall, F.R.S., of Birmingham. 8 p.m.

Royal Institution.—Mr. H. Brereton Baker, M.A., F.R.S., on "Some Unexplained Experiments," illustrated. 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. R. Dudfield on "Duties of a Sanitary Inspector: Indoor." 7 p.m.

SATURDAY, FEBRUARY 20.

Architectural Association.—Third Spring Visit to Holy Trinity Church, Prince Consort-road, Kensington Gore (back of Royal Albert Hall), by permission of Mr. G. F. Bodley, R.A. Members to meet at the church at 2.30 p.m. A visit will afterwards be paid to the Royal College of Science, Kensington, by permission of Mr. Aston Webb, R.A.

Royal Institution.—Right Hon. Lord Rayleigh on "The Life and Work of Stokes," I. 3 p.m.

Junior Institution of Engineers.—Visit to the Colonial Consignment and Distributing Company's Frozen Australasian Meat Store, Nelson's Wharf, Commercial-road, Lambeth, under the guidance of Mr. C. S. T. Molecey, A.M.I.C.E., Chief Engineer. 2 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at a house in Stoke Newington. 3 p.m.

Association of Managers of Sewage Disposal Works (Meeting at Westminster Hotel, New York-street, Leeds).—Mr. J. Ashton on "The Disposal and Utilisation of Sewage Sludge." 3 p.m.

MONDAY, FEBRUARY 22.

Surveyors' Institution.—Mr. J. H. Elwes, F.R.S., on "British Timber and its Uses." 8 p.m.

Incorporated Clerks of Works' Association.—Twenty-first Annual Dinner, Holborn Restaurant (King's Hall). 6.15 p.m.

Regent-street Polytechnic (University Extension Lectures).—Professor Vivian B. Lewes on "The Chemistry of Air, Fire, and Water," IV. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. R. Dudfield, M.A., on "Duties of a Sanitary Inspector: Offensive Trades and Trade Nuisances, etc." 7 p.m.

Glasgow Philosophical Society.—Paper by Mr. R. Scott. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. Charles T. Jacobi on "Modern Book Printing." 8 p.m.

TUESDAY, FEBRUARY 23.

Sanitary Institute (Demonstration for Sanitary Officers).—Demonstration of Bookkeeping as Carried out in a Sanitary Inspector's Office, at the Public Health Office, Town Hall, Upper-street, Islington, N., by Mr. J. R. Leggatt. 7 p.m.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Mr. A. Alban H. Scott on "Quantities and Measurements of Sanitary Works." 7 p.m.

Institution of Civil Engineers.—(1). Mr. J. Denis Twinberrow on "The Construction of Railway-Wagons in Steel." (2). Mr. A. L. Shackleford on "The Construction of Iron and Steel Railway-Wagons." (3). Mr. J. T. Jepson on "Iron and Steel Railway-Wagons of High Capacity." 8 p.m.

WEDNESDAY, FEBRUARY 24.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(1). Inspection in the District of Islington. 2 p.m. (2). Dr. A. Wellesley Harris on "Infectious Diseases." 7 p.m.

Northern Architectural Association.—Mr. Ralph Hedley on "Architectural Details in Charcoal." 7.30 p.m.

Society of Arts.—Mr. F. Tiffany on "Mahogany and Other Fancy Woods Available for Constructive and Decorative Purposes." 8 p.m.

Institution of Civil Engineers (Students' Visit).—To Inspect the Reinforced Concrete Pier in Course of Construction at Purfleet. Train from Fenchurch-street Station to Purfleet, 1.48 p.m.

THURSDAY, FEBRUARY 25.

Royal Institution.—Professor H. L. Callendar on "Electrical Methods of Measuring Temperature," I. 5 p.m.

Carpenters' Hall, London-wall (Free Lectures on Matters Connected with Building).—Professor W. Schlich on "The Forestry Problem in the United Kingdom." 8 p.m.

Institution of Electrical Engineers. — Adjourned discussion on Paper on "Trans-Atlantic Engineering Schools and Engineering," by Dr. R. M. Walmsley. 8 p.m.

London Master Builders' Association. — Annual General Meeting. 4 p.m.

Leeds and Yorkshire Architectural Society.—Mr. W. H. Bidlake on "The Romanesque Churches of Auvergne." 6.30 p.m.

FRIDAY, FEBRUARY 26.

Royal Institution.—Mr. Alexander Siemens on "New Developments in Electric Railways." 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. A. Wellesley Harris on "Methods of Disinfection." 7 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. Colin Sinclair on "Floor Paving: Wood, Granolithic, Asphalte." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. L. G. Crawford on "Boiler-House Design." 8 p.m.

SATURDAY, FEBRUARY 27.

Royal Institution.—Rt. Hon. Lord Rayleigh on "The Life and Work of Stokes," II. 3 p.m.

Sanitary Institute (Demonstration for Sanitary Officers).—Inspection at Tottenham Disinfecting Station and Dust Destructor. 3 p.m.

WEDNESDAY, MARCH 2.

Institute of Sanitary Engineers, Ltd.—Mr. Chilvers on "W.C.'s in General." 7 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect price—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.	
Hard Stocks	1	16	0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1	13	0	" " "
Facing Stocks	2	12	0	" " "
Shippers	2	10	0	" " "
Flettons	1	10	0	" a railway depôt
Red wire Cuts	1	13	0	" " "
Best Fareham Red	3	12	0	" " "
Best Red Pressed Ruabon Facing	5	0	0	" " "
Best Blue Pressed Staffordshire	4	4	0	" " "
Do. Bullnose	4	10	0	" " "
Best Stourbridge Fire Bricks	4	8	0	" " "
GLAZED BRICKS.				
Best White and Ivory Glazed Stretchers	13	0	0	" " "
Headers	12	0	0	" " "
Quoins, Bullnose, and Flats	17	0	0	" " "
Double Stretchers	19	0	0	" " "
Double Headers	16	0	0	" " "
One Side and two Ends	19	0	0	" " "
Two Sides and one End	20	0	0	" " "
Splays, Chamfered, Squints	20	0	0	" " "
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	" " "
Quoins, Bullnose, and Flats	14	0	0	" " "
Double Stretchers	15	0	0	" " "
Double Headers	14	0	0	" " "
One Side and two Ends	15	0	0	" " "
Two Sides and one End	15	0	0	" " "
Splays, Chamfered, Squints	14	0	0	" " "
Second Quality White and Dipped Salt Glazed	2	0	0	" less than best.

	s.	d.	
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	" "
Best Portland Cement	29	0	per ton, "
Best Ground Blue Lias Lime	20	6	"

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fire Clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s.	d.	
BATH STONE—delivered on road waggons, Paddington depôt	1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms depôt	1	8½	" "
PORTLAND STONE (20 ft. average)—			
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	2½	" "

	s.	d.	
Ancaster in blocks	1	11	per ft. cube, deld. rly. depôt.
Beer in blocks	1	6	" "
Greenshill "	1	10	" "
Darley Dale in blocks	2	4	" "
Red Corsehill "	2	5	" "
Closeburn Red Freestone	2	0	" "
Red Mansfield "	2	4	" "

YORK STONE—*Robin Hood Quality.*

	s.	d.	
Scappled random blocks	2	10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per foot super. "
6 in. rubbed two sides ditto, ditto	2	6	" "
3 in. sawn two sides slabs (random sizes)	0	11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	" "
1½ in. to 2 in. ditto, ditto	0	6	" "

STONE—(*continued*)—

	s.	d.	
HARD YORK—			
Scappled random blocks	3	0	per ft. cube rly. depot.
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super. "
6 in. rubbed two sides Ditto	3	0	" "
3 in. sawn two sides slabs (random sizes)	1	2	" "
2 in. self-faced random flags	0	5	" "
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube.
" 6 in. sawn both sides landings	2	7	deld. rly. depôt. per ft. super. deld. rly. depot.
" 3 in. do.	1	2½	" "

SLATES.

in.	in.	£	s.	d.	
20 × 10	best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
20 × 12	" "	13	17	6	" "
20 × 10	best seconds "	12	15	0	" "
20 × 12	" " "	13	10	0	" "
16 × 8	" "	7	0	0	"
20 × 10	best blue Portmadoc	12	12	6	" "
16 × 8	best blue Portmadoc	6	12	6	per 1000 of 1200 at r. d.
20 × 10	best Eureka unfading green	15	2	6	" "
20 × 12	best Eureka unfading green	17	2	6	" "
18 × 10	" "	12	10	0	" "
16 × 8	" "	10	5	0	" "
20 × 10	permanent green	11	10	0	" "
18 × 10	" "	9	10	0	" "
16 × 8	" "	6	10	0	" "

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depot.
Hip and Valley tiles	3	7	per doz. " "
Best Broseley tiles	50	0	per 1000 " "
Do. Ornamental tiles	52	6	" " "
Hip and Valley tiles	4	0	per doz. " "
Best Ruabon red, brown or brindled do. (Edwards)	57	6	per 1000 " "
Do. Ornamental do.	60	0	" " "
Hip tiles	4	0	per doz. " "
Valley tiles	3	0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 " "
Do. Ornamental do.	54	6	" " "
Hip tiles	4	1	per doz. " "
Valley tiles	3	8	" " "
Best "Rosemary" brand plain tiles	48	0	per 1000 " "
Best Ornamental tiles	50	0	" " "
Hip tiles	4	0	per doz. " "
Valley tiles	3	8	" " "
Best "Hartshill" brand plain tiles, sand faced.	50	0	per 1000 " "
Do. pressed	47	6	" " "
Do. ornamental, do.	50	0	" " "
Hip tiles	4	0	per doz. " "
Valley tiles	3	6	" " "

WOOD.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15	10	0	16	10	0
Deals: best 3 by 9	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 3 in., and 3 in. by 7 in. and 8 in.	11	10	0	12	10	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	"		
2 in. by 4 in. and 2 in by 6 in.	9	0	0	" 9 10 " 0		
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0	10	0	more than battens.		
½ in.	1	0	0	"		
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft. average)	3	5	0	3	15	0

JOINERS' WOOD.

	At per standard.					
White Sea: first yellow deals, 3 in. by 11 in.	23	0	0	24	0	0
3 in. by 9 in.	21	0	0	22	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	18	10	0
Second yellow deals, 3 in. by 11 in.	18	10	0	20	0	0
" " 3 in by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	15	10	0	16	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Petersburg: second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	10	0	14	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14	10	0	15	10	0
" " 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
" " 3 in. by 9 in.	12	10	0	13	10	0
" " battens	9	10	0	10	10	0
Pitch-pine: deals	16	0	0	18	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	33	0	0	upwards.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine oddments	20	0	0	22	0	0
Kauri Pine—Planks, per ft. cube	0	3	6	0	4	6
Danzig and Stettin Oak Logs— Large, per ft. cube	0	2	6	0	3	6
Small " "	0	2	3	0	2	6

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WOOD—(*continued*)—

JOINERS' WOOD.—(*Contd.*)	At per standard. £ s. d.	£ s. d.
Wainscot Oak Logs, per ft. cube..	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
½ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch....	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks—per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot	0 11 6	0 1 6
1 in. by 7 in. white, planed and matched	0 12 0	0 14 0
1¼ in. by 7 in. white, planed and matched	0 14 6	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do.	0 10 0	0 11 6
1 in. by 7 in. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ..	7 5 0
Compound Girders, ordinary sections	8 2 6 ..	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ..	8 17 6
Flitch Plates	8 5 0 ..	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ..	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 10 0 ..	8 0 0
Staffordshire Crown Bars, good merchant quality	8 0 0 ..	8 10 0
Staffordshire "Marked Bars"	10 10 0 ..	—
Mild Steel Bars	8 15 0 ..	9 5 0
Hoop Iron, basis price	9 5 0 ..	9 10 0
,, ,, galvanised	17 10 0 ..	—

(*And upwards, according to size and gauge.)

Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ..	—
,, ,, 24 g.	10 15 0 ..	—
,, ,, 26 g.	12 5 0 ..	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ..	—
Ordinary sizes to 22 g. and 24 g	13 5 0 ..	—
,, ,, 26 g.	14 5 0 ..	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ..	—
,, ,, 22 g. and 24 g.	16 10 0 ..	—
,, ,, 26 g.	18 0 0 ..	—
Galvanised Corrugated Sheets—		
Ordinary sizes, 6 ft. to 8 ft. 20 g	12 15 0 ..	—
,, ,, 22 g. and 24 g.	13 5 0 ..	—
,, ,, 26 g.	14 0 0 ..	—
Best Soft Steel Sheets, 6ft. by 2ft. to 3 ft. by 20 g. and thicker..	11 15 0 ..	—
Best Soft Steel Sheets, 22 g. & 24 g	12 15 0 ..	—
,, ,, 26 g	14 0 0 ..	—
Cut nails, 3 in. to 6 in.	9 5 0 ..	9 15 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 5 0 ..	—
Pipe in coils	14 15 0 ..	—
Soil pipe	17 5 0 ..	—
Compo pipe	17 5 0 ..	—
ZINC—Sheet—		
Vieille Montagne .....ton	26 5 0 ..	—
Silesian	26 0 0 ..	—
COPPER—		
Strong Sheet..... per lb.	0 0 10½..	—
Thin ,,	0 0 11½..	—
Copper nails ,,	0 0 11 ..	—
BRASS—		
Strong Sheet ..... per lb.	0 0 10 ..	—
Thin ,,	0 0 11 ..	—
TIN—English Ingots .... ,,	0 1 5 ..	—
SOLDER—Plumbers' .... ,,	0 0 6½..	—
Tinmen's ,,	0 0 8 ..	—
Plowpipe ,,	0 0 9 ..	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft. delivered
,, fourths	1½d. ,, ,,
21 oz. thirds	3d. ,, ,,
,, fourths	2½d. ,, ,,
26 oz. thirds	3½d. ,, ,,
,, fourths	3d. ,, ,,
32 oz. thirds	4½d. ,, ,,
,, fourths	4d. ,, ,,
Fluted sheet, 15 oz.	2½d. ,, ,,
,, 21 oz.	3½d. ,, ,,
¼ Hartley's Rolled Plate	1½d. ,, ,,
⅜ ,, ,, ,,	2d. ,, ,,
½ ,, ,, ,,	2½d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels..	per gallon	0 1 8
,, ,, ,, in drums	,,	0 1 11
Boiled ,, ,, in pipes or barrels..	,,	0 1 11
,, ,, ,, in drums	,,	0 2 2
Turpentine, in barrels	,,	0 3 10
,, in drums	,,	0 4 0
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	,,	19 0 0
Best Linseed Oil Putty	per cwt.	0 7 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

T. E. R. (Below our limit).

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional casse and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERDEEN.—For drainage of the east-end of Point Law, for the Aberdeen Harbour Commissioners. Mr. R. Gordon Nicol, Harbour Engineer, Aberdeen:—

Roderick McKay, 2, Abergeldie-road, Aberdeen	£383 9 3

ABERYSTWYTH.—For arcade and concert hall, Terrace-road, for Mr. D. Phillips. Mr. J. Arthur Jones, architect, 7, Queen's-terrace, Aberystwith:—

Lewis Bearne	£7,995	J. P. Lewis	£6,280
Owen Bros.	7,277	Edwards Bros.	6,150
David Williams	6,896	Edward E. Jenkins, Aberystwyth*	6,000
Edward Evans	6,800		
W. & J. Jones	6,538		

ACLE (Norfolk).—For partial restoration of nave, roof, and other work, Church of St. Edmund, Acle. Mr. H. J. Green, architect, 31, Castle-meadow, Norwich:—

E. G. Bland	£905 0 0	R. Chapman	£560 0 0
Graveling & Sewell	853 15 2	R. W. Riches	511 0 0
W. E. Jones	626 6 6	J. S. Smith	505 0 0
Downing Bros.	597 0 0	Chaston & Grimson	479 0 0
T. Gill	573 0 0		

ALNWICK.—For the erection of workmen's dwellings (in two blocks), for the Alnwick Council. Mr. J. Wightman Douglas, architect, 1, St. Nicholas'-buildings, Newcastle-on-Tyne, and 40, Bondgate Without, Alnwick:—

Tully & Sons	£16,344 11 8	Muckle Bros	£13,115 8 7
G. Bain	14,967 13 5	Green Bros.	12,720 0 0
Porteus	13,870 0 0	W. Dunn	12,471 1 0
McNeil	13,844 0 0	E. & T. George	12,378 13 1
Fordy	13,582 11 9	J. C. Mather	11,801 0 0
Davidson & Sons	13,368 15 0	Elliott Bros., Chathill*	11,685 0 0
R. M. Gibson.	13,216 5 4		

[Architect's estimate, £11,880.]

ASHTON-UNDER-LYNE.—For boundary wall, etc., George Mellor-road, Union Infirmary, for the Guardians. Messrs. Eaton, Sons, & Cantrell, architects, Stamford-street, Ashton-under-Lyne:—

James Lidyard, Railway Saw Mills, Ashton-under-Lyne	£1,360 10 0

ASHTON-UNDER-LYNE.—For heating system at Nurses' Home, connected with Union Hospital, for the Guardians. Messrs. J. Eaton, Sons, & Cantrell, architects, Stamford-street:—

Saunders & Taylor, Lower Moseley-street, Manchester	£189 10 0

BEDFORD.—For additions to schools, for the Education Committee. Mr. H. Young, architect, Maitland-street, Midland-road, Bedford. Quantities by architect:—

C. E. Haynes	£1,962	Corby & Son	£1,802
Litchfield & Son	1,950	Melcombe Bros.	1,763
Brown & Son	1,906	E. Dawes	1,745
R. Jeakings	1,876	Warton & Dunstall	1,708
G. Harrison	1,873	Mann & Son	1,700
E. Casbeard	1,869	C. Kilpin	1,683
J. Potter	1,866	S. Foster, Kempston, Beds.*	1,672
A. Ibbott	1,846	A. E. Pryer	1,537
C. Negus	1,845		

‡Accepted subject to the approval of the Education Department.

BLAIRGOWRIE (N.B.)—Accepted for the erection of an auction mart, for Messrs. M'Kinnon & Doeg. Mr. W. J. Brewster Grant, architect, Bengarth, Blairgowrie:—

Excavator, Mason, and Brickwork: W. & C. Duncan, Murthley	All per schedule to cost £3,000.
Carpenter, Joiner, and Glazier Work: W. T. Robertson, Blairgowrie	
Slater Work: A. R. Duncan & Son, Rattray	
Plumber Work: Robt. Kidd, Blairgowrie	
Plaster and Concrete: Peter Donaldson, Coupar Angus	
Ironwork: J. S. Fraser & Son, Rattray	
Erection of Pens: W. Falconer, Rosemount	

BRIDLINGTON.—For erection of a house and shop, Clough Bridge, for Messrs. Spencer & Son. Mr. A. T. Martindale, architect, 66, Wellington-road, Bridlington:—

T. Wood	£569 0	T. Spink	440 0
E. Corne	545 0	F. Kneeshaw	438 0
J. Rennard	510 5	E. Wilson	432 1
H. Hoggard	492 9	Sampson & Siddall, Bridlington*	431 11
J. H. Hudson	479 10	G. Storr & Son (iron not included)	415 0
A. A. Booth	461 0		
Smallwood & Shaw	452 0		
J. Stork	449 0		

BRIDLINGTON.—For the erection of shops on Clough Bridge, Bridlington, for Messrs. Chambers & Bielly. Messrs. Brodrick, Lowther, & Walker, architects Central-chambers, Bridlington:—

	For Mr. Bielly.	For Mr. Chambers.
Booth	£654 0 0 ..	£660 0 0
Spink	653 14 0 ..	673 14 0
Wilson	636 0 0 ..	623 17 0
Smallwood & Shaw	635 2 9 ..	624 16 9
Hudson	612 8 0 ..	637 10 0
Kneeshaw	604 14 6 ..	618 6 0
E. Corner, New Burlington-road, Bridlington*	582 15 0 ..	593 12 0
Rennard‡	450 0 0 ..	469 10 0

‡ Withdrawn.

BRIDLINGTON.—For the supply of 3,500 tons of whinstone and 1,000 tons of slag, for the Rural District Council of Bridlington. Mr. John Haggitt, Surveyor to the Rural Council:—

	Tons.	Price. s. d.
Whinstone, Machine Broken.		
Ord & Maddison, Darlington*	1,500 ..	11 0
R. Summerson & Co., Cockfield, Durham*	1,000 ..	11 0
Bradley Bros., Ltd., Great Ayton, Yorks.*	500 ..	11 0
Wm. Schofield, Grosmont, Whitley*	500 ..	9 6
Slag, Machine Broken, Ironstone.		
W. C. Clark, Darlington*	300 ..	7 3
Slag, Machine Broken, Annealed.		
G. Hodsman, York*	250 ..	7 9
Gladstone & Co., Grosmont, Whitley*	250 ..	6 6
Wm. Schofield, Grosmont, Whitley*	250 ..	6 6

BUCKHURST HILL (Essex).—For making-up roads, Palace-gardens, part of The Drive, and Powell-road, for the Urban District Council. Mr. H. Tooley, Surveyor:—

	The Drive.	Powell-road.	Palace-gdns.
T. Adams	£359 0 0	£497 0 0	£720 0 0
J. Ball	435 11 9	613 17 7	872 2 6
W. & C. French, Buckhurst Hill*	327 17 1	467 2 7	686 3 8
Grounds & Newton	406 11 9	579 10 8	874 19 5
Harvey Bros.	300 15 6	370 10 5	619 15 3
G. Lamble	298 0 0	429 0 0	718 0 0
Parson & Parsons	365 10 11	521 7 7	772 16 8
D. H. Porter	297 0 0	427 0 0	669 0 0
C. Summerfield	533 16 2	755 3 10	1,141 16 11
Surveyor's esti.	361 10 6	510 3 8	718 5 9

CAMELSDALE (Sussex).—For the erection of a new school in Camelsdale, near Haslemere, for the West Sussex Education Committee. Mr. J. H. Howard, architect, Lower-street, Haslemere:—

D. Fry	£1,530	L. M. Thompson	£1,220
F. Milton	1,296	W. Rollason	1,195
J. W. Humphreys	1,290	W. Harding	1,150
C. Baker	1,267	Mitchell Bros., Shalford, Guildford	1,132
Haslemere Builders	1,240		

CARDIFF.—For paving, kerbing, and channelling the footways, and forming and metalling the carriageways, of Pentyrch-street, Cwmdare-street, etc., for the Corporation. Mr. W. Harpur, M.Inst.C.E., Borough Engineer, Cardiff. Quantities by Borough Engineer:—

	C. Davies, Cardiff.	E. Osmond & Sons, Cardiff.	T. R. Williams, Cardiff*
Pentyrch-street.	£229 4 2	£220 5 3	£207 17 [illegible]
Cwmdare-street	551 1 9	533 15 6	505 16 [illegible]
Brithdir-street	220 5 7	213 18 8	202 11 11
Llsvane-street	222 10 3	216 9 11	204 16 [illegible]
Rhygoes-street	382 18 4	363 16 4	343 8 1
Gelligaer-street	174 18 4	169 10 11	159 15 [illegible]
Cwmdare-lane	65 19 7	65 17 8	62 4 [illegible]
Brithdir-lane	54 12 1	54 2 2	51 9 [illegible]

CWMYSTWYTH.—For master's house, for the Llanllhangel-y-Croyddin Upper School Board. Mr. J. A. Jones, architect, 7, Queen's-terrace, Aberystwyth:—

Henry Wright	£450	Elias Ishmael, Pontrhydygroes*	£35[illegible]
Lewis Davies	352		

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DARTFORD.—For new ward, laundry, and additions to staff quarters, Bow Arrow-lane, for the Dartford Joint Hospital Committee. Mr. R. Marchant, architect, 28, Theobald's-road, W.C. Quantities by Messrs. J. S. Paul & Son, 31, Bedford-row, W.C. :—

T. Knight*	£9,369	Nightingale	£8,380
West & Sons	9,275	Enness Bros.	8,096
Scott & Branton†	9,106	A. Faulks	7,999
Multon & Wallis	8,982	Pearless, Dennis, & Co.	7,950
J. Lonsdale	8,957	Ellingham & Sons	7,877
Spencer & Sons	8,563	W. F. Blay, Dartford*	7,636
J. Ferguson & Co.	8,560		
Terry Building Co.	8,417		

DRIGHLINGTON.—For the erection of a branch store, for the Co-operative Society, Ltd. Mr. T. A. Turpin, architect. Quantities by architect :—

Masons' Work : S. and D. Thornton, Drighlington, near Bradford, Yorks.	£570	0	0
Joiners' Work : J. E. Grayshon, Adwalton, near Bradford	150	0	0
Slaters' Work : J. M. Thornton & Son, Heckmondwike, Yorks	24	18	0
Plumbers' Work : Alf. Cooper, Drighlington	13	18	0

EDINBURGH.—For the reconstruction of tenements, Nos. 20 to 25, Greenside-row, for the Magistrates and Council. Mr. James Massie, Burgh Engineer. Quantities by Mr. Alexander B. M. Smith :—

Mason : Scott & Brown, Barclay-place, Edinburgh	£1,057	6	7
Joiner : Jas. Duncan & Son, Grove-street, Edinburgh	615	0	0
Smith : P. Bell & Son, Pitt-street, Edinburgh	91	5	0
Slater : Jas. Duncan & Son, Buccleuch-street, Edinburgh	80	17	0
Plumber : D. Blake & Co., Beaverhall-road, Edinburgh	225	0	0
Plasterer : John Findlay, South Fort-street, Leith	240	0	0
Painter : P. & J. Gordon, Leithwalk, Edinburgh	49	10	0
Glazier : Coutts & Co., Lochrin-place, Edinburgh	11	12	0

GREAT YARMOUTH.—For Carnegie gift extension to the Free Library, for the Free Library Committee. Mr. J. W. Cockrill, A.R.I.B.A., Borough Surveyor, Town Hall, Great Yarmouth :—

Carter & Wright, Great Yarmouth* £4,790

HASTINGS.—For building and drainage work at workhouse infirmary, Ore, for the Guardians. Messrs. A. W. Jeffery & Son, architects, 5, Havelock-road, Hastings :—

Piper	£1,325	0	
Leonar	1,277	17	
A. Cruttenden	1,249	0	
T. King	1,225	0	
Padgham & Hutchinson	1,219	0	
Cramp	1,214	0	
Harvey	1.197	10	
Roffe	£1,195	0	
Snow	1,151	0	
Adams	1,123	0	
H. E. Cruttenden	1,092	0	
Lamb	1,021	0	
Paulson	1,010	0	
Ditch	1,007	0	

[All of Hastings].

KING'S LYNN.—For new public library. Mr. H. J. Green, architect, 31, Castle-meadow, Norwich :—

Read & Wildbur	£4,360	0	0
J. Medwell	4,340	9	0
Bardell Bros.	4,298	0	0
Tash, Langley, & Co.	£4,150	0	0
R. Dye	4,072	0	0
A. F. Foreman	3,887	5	0
W. F. Smith	3,827	12	0

KINGSWINFORD.—For 1,155 tons of c.i. pipes (contract No. 3), for the Rural District Council. Mr. W. Fiddian, Engineer, Old Bank Offices, Stourbridge :—

Nine tenders from £6,703 12s. 11d. downwards were received. Messrs. David Parsons & Sons, Brierley Hill, accepted at £5,363 17s. 8d.

KINGSWINFORD.—For manholes and lamphole covers, etc. (contract No. 2), for the Rural District Council. Mr. W. Fiddian, Engineer, Stourbridge :—

Thirty-nine tenders from £1,760 14s. downwards were received. Mr. George Glaze, of Pensnett, near Dudley, accepted at £796 9s. 7d.

KINGSWINFORD.—For distributing carriers, effluent drains, road making, and additions to farmhouse and buildings, for the Rural District Council. Mr. W. Fiddian, Engineer to the Council, Stourbridge :—

Eleven tenders from £7,955 12s. 1d. downwards were received. Messrs. T. Vale & Sons, Ltd., of Stourport, Kidderminster, accepted at £4,780.

LEYTON.—For watering and cartage, for the Leyton Urban District Council. Mr. W. Dawson, M.Inst.C.E., Town Hall, Leyton :—

M. H. Abbott & Co., Leytonstone.*

Watering :—Man, horse, and harness, at per day : Division 1, 9s. 6d. ; Division 2, 9s. 6d. ; Division 3, 9s. 6d. ; for the three divisions included in one contract, 9s. 6d.

Cartage :—Cart, horse, and driver, at per day : Division 1, 9s. ; Division 2, 9s. ; Division 3, 9s. ; for the three divisions included in one contract, 9s. Slop cart, horse, and driver, at per day : Division 1, 9s. 3d. ; Division 2, 9s. 3d. ; Division 3, 9s. 3d. ; for the three divisions included in one contract, 9s. 3d. Horse, harness, and man for "slopping," council supplying slop cart, at per day : Division 1, 8s. 9d. ; Division 2, 8s. 9d. ; Division 3, 8s. 9d. ; for the three divisions included in one contract, 8s. 9d. Horse, harness, and man, for "road sweeper," at per day : Division 1, 8s. 9d. ; Division 2, 8s. 9d. ; Division 3. 8s. 9d ; for the three divisions included in one contract, 8s. 9d.

LLANWRDA.—For constructing a new roadway and water supply at Llathygae and Cwm-bach-tel, near Pumpsaint, Llanwrda, for Mr. H. M. Lloyd. Mr. D. Jenkins, architect, Llandilo :—

Water Supply.

Fitzmaurice & Co.	£392	0	0
Evans Bros.	377	4	6
Pritchard Davies, Llandilo*	£350	0	0
William Morgan.	349	17	0

Roadway.

William Morgan	£1,048	0	
Pritchard Davies	965	0	
Evans Bros.	£888	10	
Fitzmaurice & Co.	876	0	

LICHFIELD.—For improvement and extension of sewerage system, for the Corporation of Lichfield. Messrs. Elliott & Brown, engineers, Burton-buildings, Parliament-street, Nottingham. Quantities by engineers :—

J. White, jun.	£9,828	5	7
Jas. Jameson	9,000	0	0
O. Warburton	8,300	0	0
Bentley & Loch‡	8,322	3	0
Fitzmaurice & Co., Ltd.	8,258	1	10
Siddons & Freeman	7,900	0	0
J. Laing	7,721	0	0
H. H. Barry	7,660	0	0
T. Lowe & Sons	£7,650	0	0
W. Williams	7,400	0	0
G. J. Tomlinson	7,374	0	0
Johnson & Langley, Leicester*	7,306	7	7
W. Walkerdine	7,136	0	0
J. Holme	7,129	0	0
W. H. Pickin‡	7,102	15	0
J. W. Dean, Ltd.	6,920	13	7

‡ Withdrawn.

LONDON.—For reconstruction, for electrical traction, of the Streatham cable tramways, and construction of authorised tramways at Tooting, for the London County Council :—

George Law	£128,587	11	3
William Kennedy	113,896	12	11
John Mowlem & Co., Ltd.	111,710	0	0
Pethick Brothers	110,142	16	8
Robert W. Blackwell & Co., Ltd.	104,604	10	6
William Underwood & Brother	99,221	0	0
Edmund Nuttall & Co.	97,132	13	1
Dick, Kerr, & Co., Ltd.	95,751	7	9
J. G. White & Co., Ltd.	95,005	7	4
William Griffiths & Co., Ltd., London‡	86,623	19	11

‡ Recommended for acceptance.

LONDON.—For alterations and additions at the Jews' Free School, Spitalfields, E. Mr. Edward Robert Robson, F.S.A, architect, Palace-chambers, Westminster. Quantities by Messrs. John Leaning & Sons, 28, John-street, Bedford-row.

		Net Credit for old materials.
J. Mowlem & Co., Ltd.	£71,990	£100
J. Garrett & Son	57,990	—
Coulsell Bros.	56,479	250
Holland & Hannen	54,697	100
Foster & Dicksee	54,445	400
Holloway Bros.	53,876	176
F. & H. F. Higgs	53,925	500
F. G. Minter	52,488	—
G. H. & A. Bywaters	52,395	50
H. Lovatt	52,200	300
E. Lawrence & Sons	51,585	50
J. Carmichael	50,575	40

LONDONDERRY.—For hot water heating apparatu, in County Council offices, for the Proposals Committee County Council. Mr. Chas. L. Boddle, County Surveyor, Londonderry :—

Riddels, Ltd.	£328	10	
Joseph Donaghy	319	0	
Musgrave & Co.	318	10	
Brightside Foundry & Engineering Co.	318	0	
Maguire & Gatchell, Ltd.	£308	10	
Lancashire Heating Co., Manchester*	287	0	

LONDON SCHOOL BOARD TENDERS.

Buckingham-terrace School, North Kensington, for Halls and other Improvements.

Providing halls, about 45 ft. by 31 ft., for all departments ; new infants' teachers' room and additional cloakroom ; re-stepping classrooms in the boys' and girls' departments. Heating by open fires and stoves. The alterations will result in a net reduction of twenty-four places in the total accommodation of the school, the revised accommodation, on the completion of the improvements, being for boys, 348 ; girls, 348 ; infants, 442—total, 1,138 :—

Stimpson & Co.	£6,264	0	0
Stevens Bros.	5,956	0	0
General Builders, Ltd.	5,928	0	0
Marchant & Hirst	5,680	0	0
H. Wall & Co.	5,585	0	0
J. Simpson & Son	£5,542	0	0
Lathey Bros.	5,333	0	0
F. G. Minter	5,333	0	0
Leslie & Co., Ltd.	5,204	2	6
Treasure & Son	5,117	0	0
E. Triggs*	5,067	0	0

Sydenham Hill-road School, for Enlargement and Improvement of Boys' and Girls' School.

Boys' and girls' departments : Providing halls, about 35 ft. by 28 ft. 6 in. ; two new classrooms, fifty and forty-eight each, for boys' department ; providing one new classroom for fifty and enlarging one classroom to sixty in girls' department ; additional staircase for girls' ; two new rooms for teachers, cloakrooms and lavatories ; re-dividing and re-lighting existing classrooms ; providing new heating chamber and low-pressure hot-water apparatus. Providing combined cookery and laundry centre, and manual training centre for twenty boys ; new covered playground for girls' and infants' ; refixing present boys' covered playground ; removing existing babies' w.c.'s and rebuilding same ; and enclosing, draining, and tar-paving the additional land. Revised accommodation—Boys, 326 ; girls 346 ; total, 672. Net gain of places—Boys, 32 ; girls, 62 ; total, 94.

F. & H. F. Higgs	£11,999		
G. E. Wallis & Sons	11,344		
General Builders, Ltd.	11,341		
E. Lawrance & Sons	11,080		
Patman & Fotheringham, Ltd.	10,985		
Lathey Bros.	10,933		
W. J. Mitchell & Son	£10,928		
J. Appleby & Sons	10,850		
J. Garrett & Son	10,663		
Martin, Wells & Co., Ltd.	10,648		
J. Smith & Sons, Ltd.	10,464		
J. & C. Bowyer*	10,357		

Hearnville-road Site, Balham, for Erecting Three Brick Structures for Temporary School Accommodation in the first instance.

Holloway Bros., Ltd.	£5,207		
W. Akers & Co.	5,187		
E. P. Bulled & Co.	5,075		
General Builders, Ltd.	4,995		
Spencer, Santo, & Co., Ltd.	4,984		
T. D. Leng	4,975		
J. Carmichael	4,962		
Rice & Son	4,958		
Lathey Bros.	£4,953		
J. Garrett & Son	4,880		
W. Johnson & Co., Ltd.	4,850		
Martin, Wells, & Co., Ltd.	4,824		
Stimpson & Co.	4,795		
Edwards & Medway	4,792		
E. Triggs*	†4,697		
J. Appleby & Sons	4,230		

† This amount is inclusive of the sum of £125 for extra for glazed brick internal facings.

[A letter was received from Messrs. J. Appleby & Sons, whose tender is lowest, stating that they had made a clerical error in their tender, which should read as £4,630 ; and withdrawing their tender.]

Various articles of furniture :—

(*a*) Mr. H. Bouneau, of Nos. 1A and 2, Royal Victor-place, Old Ford-road, E., for the supply of large green baize notice boards, at 2s. 9d. per foot run.*

(*b*) Mr. T. Cruwys, of No. 73, Camden-street, Camden Town, N.W., for the supply of (i.) E.C. boards (large), at £4 16s. per doz. ; (ii.) do. (small), at £3 11s. per doz. ; and (iii.) tool racks for Manual Training Centres, at £1 3s. each.*

(*c*) Messrs. G. M. Hammer & Co., Ltd., of No. 370, Strand, for the supply of (i.) swing slates (No. 1), at £1 18s. each ; and (ii.) do. (No. 2), at £2 7s. 6d. each.*

(*d*) Messrs. T. R. Roberts, Ltd., of Upper-street, Islington, N., for the supply of (i.) slate slabs (No. 1), at 11s. 1d. each ; and (ii.) do. (No. 2), at 6s. 2d. each.*

(*e*) Messrs. T. Wallis & Co., Ltd., of Holborn-circus, E.C., for the supply of folding steps at £7 13s. per dozen pairs.*

Running Contracts for the Supply of Sockets and Rubber Rings for Casters.

(*a*) Rubber rings (for castors).

	per doz. s. d.		per doz. s. d.
T. Bugden	7 6	J. G. Ingram & Son	3 9
Sheath Bros.	5 6	Reddaway & Co., Ltd.*	3 0
P. B. Cow & Co.	3 9		

[Previous price, 6s. 10d. per doz. Existing Contract will expire on February 17, 1904.]

(*b*) Sockets (for Union Jacks).

	per doz. s. d.		per doz. s. d.
F. Bird & Co.	10 6	Pryke & Palmer	6 8-16-25
J. Franklin & Son	7 3	Dawes, Betts, & Co.*	6 6
Portway & Sons	7 0		

[Previous price, 6s. 10d. per doz. Late contract expired on January 20, 1904.]

Running Contract for the Supply of Materials for Repairing Carpenters' Benches.

—	Tops. £ s. d.	Handles. s. d.	2-in. Screws. s. d.	2½-in. Screws. s. d.	Approximate annual expenditure calculated on the tender of each Contractor. £ s. d.
H. Bouneau ..... each	0 12 0	0 4	1 5	1 6	61 12 4
W. Brake & Co. ..... ,,	1 3 0	1 0	2 6	3 0	120 16 0
General Builders, Ltd. ..... ,,	1 1 0	1 6	2 6	3 0	119 12 0
Goodall, Lamb, & Heighway, Ltd. ,,	1 3 0	—	—	—	—
G. M. Hammer & Co., Ltd. ..... ,,	0 14 6	0 6	1 6	1 9	73 6 6
Marchant & Hirst ..... ,,	0 7 6	0 6	2 0	1 9	55 12 6
E. Spencer & Co.* ..... ,,	0 8 6	0 4	1 6	1 8	52 10 4
Previous prices ..... ,,	0 10 0	0 4	1 5	1 6	—

Repairs on Schedule of Prices.

In accordance with the authority granted by the Board on the 4th February, 1904, the Works Committee have now obtained fresh tenders for carrying out repairs to the schools of the Board in Group 2 of the Tower Hamlets Division on the printed Schedule of Prices as revised.

[The percentages required by the contractors to be added to the printed Schedule of Prices are shown below The percentages under "A" are for repairs, measured work, under "B" for sanitary measured work (executed under the orders of the Sanitary Surveyor) ; and under "C" for day work generally, *i.e.*, wages and materials. The small repairs to the schools in this Group are done by workmen employed direct by the Board.]

		A For Repairs, measured work.	B For Sanitary, measured work.	C For Daywork, generally.
J. Dolman & Co.	percentages on Schedule	+ 15	+ 25	+ 10
J. F. Holiday	,,	+ 12½	+ 20	+ 12½
Parrott & Isom*	,,	+ 15	+ 15	+ 15
A. J. Sheffield	,,	+ 20	+ 33⅓	+ 15
Vigor & Co.	,,	+ 22½	+ 37½	+ 17½
Previous Percentages		+ 20	+ 25	+ 10

TENDERS—*Continued on page* 211.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom required.	Premiums.	Designs to be delivered
*Designs for Isolation Hospital	Barnet Hospital Committee	Not stated	May 9
*Proposed Memorial Building	Eton College	Not stated	No date.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Boundary Wall, Plymouth-grove Recreation Ground	Manchester Corporation	City Surveyor's Office, Town Hall, Manchester	Feb. 19
Gates and Iron Fencing, do.	do.	do.	do.
Morrill-street Extension	Hull Corporation	A. E. White, City Engineer, Town Hall, Hull	do.
Buildings, 201, High-street, Elgin		J. Wittet, Architect, Elgin	do.
Bakery, Coal Stores, etc.	Newton Abbot Corporative Soc., Ltd.	S. Segar, Architect, 24, Union-street, Newton Abbot	Feb. 20
Electric Light, Boroughmuir School	Edinburgh School Board	J. A. Carfrae, 3, Queen-street, Edinburgh	do.
Cast Iron Pipes	Harrogate Corporation	E. W. Dixon, M.Inst.C.E., 14, Albert-street, Harrogate	do.
Hothouses at Ruchill Hospital	Glasgow Corporation	Superintendent of Parks, City-chambers, Glasgow	do.
Alterations, Golden Lion Inn, Romanby, N'rthallerton	Plews & Sons	W. H. Bourne, Architect, Darlington	do.
Add. to Hide & Skin Stores at Abattoir, M'Auley-st.	Belfast Corporation	City Surveyor's Office, Belfast	do.
Brick Kiln-lane Works	Coventry Corporation	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry	Feb. 22
Supplies	Stafford Corporation	W. Blackshaw, Borough Engineer, Borough Hall, Stafford	do.
Making-up Rutland-road-lane, etc.	Plymouth Corporation	J. Paton, Borough Engineer, Plymouth	do.
Materials	Kingston Guardians	J. Edgell, Union Offices, Coombe-road, Kingston-on-Thames	do.
Eight Houses, Barrass-terrace, Upper Wortley		J. Charles & Son, 98, Albion-street, Leeds	do.
Water-Closet Works, Whetley-lane School	Bradford Education Committee	Architect's Department, Education Office, Manor-row, Bradford	do.
Boundary Walls and Railings, Thackley School	do.	do.	do.
Alter., etc., Richm. Bl. Inst., 41, U. S'kville-st., Dublin		Patterson & Kempster, 95, Lower Leeson-street, Dublin	do.
Materials	Macclesfield R.D.C.	Assistant Clerk at Union Offices, Macclesfield	do.
Completion of St. Mary's Church, Wombwell		C. & C. M. Hadfield, Architects, 19, St. James-street, Sheffield	do.
Tail Shafts for Ferry Steamers	Wallasey U.D.C.	Manager, Egremont Ferry, Cheshire	do.
Stores (Electric Lighting)	Battersea Borough Council	Electrical Eng., Electric Light Station Lombard-rd., London, S.W.	do.
Foundations of Cricket Pavilion, Cardiff Arms Park		Veall & Sant, Architects, Cardiff	do.
Building Two Lead Stacks, Elswick Lead Works	Walkers, Parker, & Co.	J. Little, Engineer, Viaduct-chambers, Carlisle	do.
Covered Way at Workhouse Infirmary	Warwick Guardians	F. P. Treppass, 1, Church-street, Warwick	do.
One 750 kw. Continuous Current Dynamo	Aston Manor Corporation	T. J. Ballard, Eng., Electricity Works, Chester-st., Aston Manor	Feb. 23
Quarrying and Carting Road Material	Midlothian County Council	Road Office, 29, St. Andrew-square, Edinburgh	do.
Painting, etc., Baths Roof, Pitfield-street	Shoreditch Borough Council	Borough Surveyor, Town Hall, Old-street, E.C.	do.
Thirteen Houses, Scarbottom, Mytholmroyd		T. Kershaw, A.R.I.B.A., Lancs. & Yorks Bank-chambers, Halifax	do.
Air Compressor, Steam Engine, etc.	Health Committee, Stafford	W. Blackshaw, Borough Engineer, Borough Hall, Stafford	do.
Granite	Foleshill R.D.C.	A. P. Oswin, Clerk, Council Offices, Little Heath, Foleshill	do.
Rebuilding Railway Hotel, Askern	Carter's Knottingley Brewery Co.	Garside & Pennington, Architects, Pontefract	do.
Disinfectant	Middleton Corporation	C. H. Norton, Sanitary Inspector, Town Hall, Middleton	do.
*Annual Contracts	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Roadmaking and Paving Works	do.	do.	do.
Comiston-road Sewer	Edinburgh City Council	Burgh Engineer, City-chambers, Edinburgh	Feb. 24
Erection, Removal, and Repair of Stalls for Markets	Kingston-on-Thames Corporation	H. A. Winser, Town Clerk, Municipal Offices, Kingston-on-Thames	do.
Electricity Meters, etc.	Hammersmith Borough Council	G. G. Bell, Borough Electrical Eng., 57, Fulham Palace-rd., London	do.
Additions, etc., to Steading at Midtown, Glass		J. S. Thomson, Blairmore Estates Office, Fife, Keith	do.
Shop and Dwelling-house at Bowerham, Lancs.	E. Williams	J. Parkinson, Architect, 67, Church-street, Lancaster	do.
Villa at Coedsaeson, near Swansea		C. T. Ruthen, Architect, Bank-chambers, Heathfield-st., Swansea	do.
Sunday School, Lower Darwen	United Methodist Free Church	Sames & Green, Architects, Knott street, Darwen, Lancs.	do.
One 750 kw. Steam Alternator	Ealing Corporation	J. D. Knight, Engineer, Electricity Works, South Ealing, W.	Feb. 25
Paving Streets	Gateshead Corporation	J. Bower, C.E., Borough Engineer, Town Hall, Gateshead	do.
Materials	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham	do.
Electric Generator	Greenock Corporation	J. A. Robertson, Burgh Electrical Eng., Hunter-place, Greenock	do.
Five Motors		W. H. Archer & Son, The Grove, Gravesend	do.
Granite, etc.	Tadcaster R.D.C.	T. Scott, Surveyor, Aberford, near Leeds	do.
Carting Materials	do.	do.	do.
Steel Works, St. Peter's-square	Harrogate Corporation	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	do.
Furnishings, etc., & Works, for Lighting Department	Glasgow Corporation	Lighting Department, 52, College-street, Glasgow	do.
Sewer., Pav., etc., Sts. & Passa., Seaford-rd. Pendleton	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	do.
Building a Wall, do.	do.	do.	do.
74 Cottages, 6 Houses, and 25 Shops, do.	do.	do.	do.
56 Cottages and 8 Houses, do.	do.	do.	do.
36 Cottages and 7 Houses, and 1 Shop, do.	do.	do.	do.
34 Cottages and 7 Houses, do.	do.	do.	do.
Painting Cemetery Chapels, etc.	Burial Board Committee, Stafford	W. Blackshaw, Borough Engineer, Borough Hall, Stafford	do.
Stone, etc.	Brixworth R.D.C.	W. C. Woodford, Market-square, Northampton	do.
Hauling Materials	do.	Mr. Wykes, 5, Elysium-terrace, Northampton	do.
Pair of Cottages, East Harting, near Petersfield	E. Lephard	J. Luff, East Harting Farm, Petersfield	do.
Police Station, Kelso		Police Station, Kelso	do.
Vestry, etc., St. Mary's Church, Roch, Pembroke		D. E. Thomas, Architect, Victoria-place, Haverfordwest	do.
*Cottages, Houses, and Shops, Pendleton	Salford Borough Council	Borough Engineer, Town Hall, Salford	do.
*Works and Materials	Hackney Borough Council	Borough Surveyor, Town Hall, Hackney, N.E.	do.
Electricity Works Contracts	Stourbridge U.D.C.	J. B. Clarke, Engineer, Town Hall, Stourbridge	Feb. 26
Workmen's Library, Institute, etc., Caeran, Maesteg	Trustees	E. W. Burnett & Son, Architects, Jarrow House, London	do.
Five One-horse Carts	Newburn U.D.C.	T. Gregory, Surveyor, Newburn-on-Tyne	do.
Materials, etc.	do.	do.	do.
Extensions to Engineering Works, Hare-st., Halifax.	Stead Bros.	T. Kershaw, A.R.I.B.A., Lancs. & Yorks Bank-chambers, Halifax	do.
Presbyterian Church, Hawthorn-road, Llandaff		D. Pugh-Jones, Architect, Queen's-chambers, Queen-street, Cardiff	do.
Two Shops and House in Cross-street, Camborne	Mrs. Faull	C. Richards, Pendarves-street, Tuckingmill, Cornwall	do.
*Refreshment Room and Kitchen, Victoria Park	London County Council	Architect's Department, 15, Pall Mall East, S.W.	do.
†500 Tons of c.i. Pipes	Glasgow Corporation	J. R. Sutherland, Eng. to Water Dept., 45, John-street, Glasgow	Feb. 27
Steam Dynamo	St. Anne's-on-the-Sea U.D.C.	J. H. Clothier, Engineer, Electricity Works, St. Anne's-on-the-Sea	do.
Caretaker's House and Reading Room	The Horden Collieries, Ltd.	G. Wells, Shotton Colliery	do.
1,000 Tons English Portland Cement	Harrogate Corporation	E. W. Dixon, M.Inst.C.E., 14, Albert-street, Harrogate	do.
Limestone and Team Labour	Llandaff and Dinas Powis R.D.C.	J. Holden, Surveyor, Llandaff-chambers, Cardiff	do.
Clee Hill Stone	do.	do.	do.
Tools, Cartings, etc.	do.	do.	do.
6,000 Tons of Whinstone and Gravel	East Riding County Council	County Surveyor, Beverley	do.
Team Labour	do.	do.	do.
Two Miles of Fencing, Glendinning, etc.		J. Stark, Westerhall, Langholm, N.B.	do.
Electric Tramways for Specification No. 24	Kirkcaldy Corporation	O. F. Francis, Burgh Electrical Engineer, Victoria-road, Kirkcaldy	do.
Additions, etc., to Bank, Newport-road, Cardiff	Wilts and Dorset Bank	E. H. Bruton, F.R.I.B.A., 119, Queen-street, Cardiff	do.
Add., etc., Bank Meadow Municipal School, Ardwick	Manchester Education Committee	Education Office, Deansgate, Manchester	do.
House, Ardgye		J. Wittet, Architect, Elgin	do.
Temporary Staging for Bridge, Carlisle	Workington Bridge & Boiler Co., Ld.	J. Eden, C.E., 58, Pow-street, Workington	do.
Granite, etc.	Thrapston R.D.C.	C. Hunnybun, Clerk to Council, Thrapston	do.
Police Station at Lenghenydd, near Caerphilly	Glam. Quarter Sess. & Coun. Council	T. Mansel Franklin, County Council Offices, Westgate-st., Cardiff	do.
Sixteen Cottages at Graigberthlwyd, near Treharris	Building Club	W. Dowdeswell, Architect, Treharris	do.
Materials and Stones	Heaton Norris U.D.C.	F. W. Brooke, Council Offices, Heaton Moor	do.
Reading and Recreation Rooms, Nethy Bridge		The Reading Rooms, Granite Villa, Nethy Bridge, Inverness	do.
1¼ Miles of Steel Piping, Snowden Power Station	Portmadoc & N. Wales Co.	Harper Bros., Engineers, 13, St. Helen's-place, London, E.C.	Feb. 29
Stores	King's Norton and Northfield U.D.C.	Surveyor, 23, Valentine-road, King's Heath	do.
Pipe Sewer in Seacliffe-road	Bangor U.D.C.	E. L. Woods, C.E., Town Hall, Bangor, co. Down	do.
Chalk, Flints, and Granite	Steyning West R.D.C.	E. Cripps, Clerk, Council Offices, New Shoreham, Sussex	do.
Main Pipes	Edinburgh Gas Commissioners	W. R. Herring, Engineer, New-street Works, Edinburgh	do.
Stores and Materials, Highways and Tramways	Halifax Corporation	J. Lord, Borough Engineer, Town Hall, Halifax	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Stores, Electricity Department	Halifax Corporation	W. M. Rogerson, Borough Electrical Engineer, Foundry-st., Halifax	Feb. 29
Stores, Tramways Department	do.	F. Spencer, Tramways Manager, Southern Depot, Halifax	do.
Midhurst Drainage, Contract No. 1	Midhurst R.D.C.	J. Taylor, Sons, & S. Crump, Engs., 27, Gt. George-st., Westminster	do.
Stores (Electric Lighting)	Electricity and Tramways Com.	A. S. Giles, Engineer, Electricity Works, Jubilee-street, Blackburn	do.
Pipework, etc., Electric Light, etc., Supply	Kilmarnock Corporation	W. Middlemas, Town Clerk, Kilmarnock	do.
Lamps, Electric Light, etc., Supply	do.	do.	do.
Lighting & Tract'n Feeders, etc., Elec. Light, etc., Sup.	do.	do.	do.
Meters, Electric Light, etc., Supply	do.	do.	do.
Stores for Electricity Works	Hornsey Town Council	N. Staniland, Borough Electrical Eng., Tottenham-lane, Hornsey	do.
Cables and Cable Stores	do.	do.	do.
Stores, Road Materials, etc.	York Corporation	City Engineer's Office, York	do.
1,983 Yds. of Stone Flagging for Pavem't, Duncrue-st.	Belfast Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast	do.
Fifty Cottages, Nicholas-street, Limerick	Thomond Artisan Dwellings Co.	J. F. Power, Carr-street, Limerick	do.
Eighty Tons c.i. Pipes, etc.	Sandal U.D.C.	F. Massie, A.M.Inst.C.E., Tetley House, Wakefield	do.
Material	Bolton-upon-Dearne U.D.C.	J. L. Hawksworth, Clk., Co. Of., Bolton-upon-Dearne, Rotherham	do.
Road Works, Park-crescent, Roundhay	Leeds District Council	E. J. Silcock, M.Inst.C.E., 10, Park-row, Leeds	do.
Sewering, Paving, etc., Streets and Passages	Waterloo-with-Seaforth U.D.C.	F. S. Yates, Surveyor, Town Hall, Waterloo, near Liverpool	do.
School Furniture, Shaftesbury-road School	East Ham Education Committee	H. C. Padgett, Education Office, East Ham, E.	do.
Renewal of Guild-street Bridge, Aberdeen	Caledonian Railway Company	P. M. Barnett, C.E., 80, Guild-street, Aberdeen	do.
Enlargement to Auchtermuchty School		W. Birrell, Architect, 200, High-street, Kirkcaldy	do.
Fire Station, Borough-road, Darlington	Corporation	G. Winter, Borough Surveyor, Town Hall, Darlington	do.
Sunday School, Wesleyan Ch., Shortlane End, Truro		H. Northey, Saddler, Shortlane End	do.
*Annual Contracts	Hendon U.D.C.	Council's Surveyor, Council Offices, Hendon, N.W.	do.
House and Shop Refuse Contract	Waterloo with Seaforth U.D.C.	F. S. Yates, Surveyor, Town Hall, Waterloo, near Liverpool	Mar. 1
Sewerage Works and Bridge, Langley Park	Lanchester R.D.C.	J. R. Lupton, Surveyor, Lanchester	do.
Painting, Papering, etc., Dispensary, etc., Crumlin	Antrim Union	Mr. Carkin, Crumlin, Antrim	do.
Business Premises and House, New Tredegar	Isaac Pruss	G. Kenshole, Architect, Station-road, Bargoed	do.
Twenty Houses, Bedlinog	Bedlinog Building Club	P. Vivian Jones, Architect, Bengoed	do.
Schools, Cawood, near Selby	Cawood Feoffees	T. S. Ullathorne, Architect, Selby	do.
Street Improvement and Surface Water Drainage	Kirkby-in-Ashfield U.D.C.	W. Dodsley, Surveyor, Stockwell-gate, Mansfield	do.
Sewering Mill Fold-road	Middleton Corporation	W. Welburn, Town Hall, Middleton	do.
Celtic Cross, Gill Abey, Cork	Com., Cork Soldiers' Memorial	W. H. Hill & Son, Architects, 28, South-mall, Cork	do.
Pier or Br'kwater & Quay, Pennan Harbour, Aberdeen		J. Barron, M.Inst.C.E., 216, Union-street, Aberdeen	do.
*Making-up Roads	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	do.
*New Stabling at Reliance Wharf, Hertford-road, N.	M.B. of Shoreditch	Borough Surveyor, Town Hall, Old-street, E.C.	do.
Scavenging and other Works	Llandaff and Dinas Powis R.D.C.	M. Warren, Clerk, Llandaff-chambers, Cardiff	Mar. 2
Restoration of Roofs of Wolborough Church	Rector and Churchwardens	W. Rowell, Architect, 2, St. Paul's-road, Newton Abbot	do.
Materials (Stones, etc.)	Headington R.D.C.	J. C. Coates, Dis. Surv., Hartfield Cott., New Headington, Oxford	do.
Carting Work	do.	do.	do.
Team Labour	Northampton R.D.C.	R. W. Wood, District Surveyor, Kislingbury	do.
Stone, etc.	do.	W. Tomalin, 14, Guildhall-road, Northampton	do.
Painting Station Buildings	N.E. Ry.	C. A. Harrison, Engineer, Central Station, Newcastle	do.
Block of Offices at Forth Banks, Newcastle-on-Tyne	do.	W. Bell, Architect, Central Station, Newcastle	do.
Ten Ornamental Shelters	Blackpool Corporation	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool	do.
90 ft. of Old Iron or Steel Circular Boiler Shells	St. Austell R.D.C.	T. H. Andrew, Engineer, 1, Trevarrick Villas, St. Austell	do.
*New Corridor to Entrance Lodge, Norwood Schools	Lambeth Guardians	Clerk, Brook-street, Kennington-road, S.E.	do.
*Annual Contracts	Southgate U.D.C.	Council's Surveyor, Palmer's Green, N.	do.
*Annual Contracts	Borough of Hampstead	Borough Engineer, Town Hall, Haverstock Hill, N.W.	do.
Steel Suspension Foot-bridge at Blackhall Mill	Blaydon U.D.C.	G. Lyon, Surveyor, Blaydon-on-Tyne	Mar. 3
Timber Wharf at Runcorn	Manchester Ship Canal Co.	W. H. Hunter, M.Inst.C.E., 41, Spring-gardens, Manchester	do.
*Triennial Contracts for Repairs	Receiver for Metrop. Police District	Police Surveyor, New Scotland Yard, S.W.	do.
Wesleyan Chapel, Crowle, Lincs.		T. B. Thompson, Architect, 15, Parliament-street, Hull	Mar. 4
Gas Holder and Steel Tank, Penrhiwceiber	Mountain Ash U.D.C.	Corbett, Woodall, & Son, Eng., Palace-ch., Bridge-st., Westminster	do.
Materials and Stores	Levenshulme U.D.C.	J. Jepson, Surveyor, 8a, Tiviot-dale, Stockport	do.
*Superstructure, Northern District Post Office	Commissioners of H.M. Works, etc.	J. Wager, H.M. Office of Works, Storey's-gate, S.W.	do.
Three Miles of Tramways, Coventry	New General Traction Co.	J. E. Winslow, Engineer, 20, Bishopsgate-street Within, E.C.	Mar. 5
Reconstruction of 5¼ Miles of Tramways, Coventry	do.	do.	do.
Road Material and Carting	Rotherham R.D.C.	R. Bradbury, District Surveyor, 29B, High-street, Rotherham	do.
Flints	Steyning West R.D.C.	E. Cripps, Clerk, Council Offices, New Shoreham, Sussex	Mar. 7
Road Materials	Wangford R.D.C.	F. S. Rix, Clerk to Council, Beccles	do.
Road and Street Works	Holywood U.D.C.	J. H. Barrett, Council Office, Town Hall, Holywood	do.
*Works and Materials	St. Marylebone Borough Council	Town Clerk, Town Hall, St. Marylebone, W.	do
Materials	Batley Town Council	O. J. Kirby, Borough Surveyor, Branch-road, Batley	Mar. 8
*Supply of Waterproof Clothing	West Ham Borough Council	Borough Engineer, Town Hall, Stratford, E.	do.
*New Tower and Completion of Church, Hertford		Austen & Pa'ey, Architects, Lancaster	do.
*Circular Service Reservoir, etc.	Longleat Estate Office, Warminster	Willcox & Raikes, 63, Temple-row, Birmingham	do.
Whinstone, Dumbartonshire Roads		H. Hutcheson, Clerk, 115, Wellington-street, Glasgow	Mar. 9
Quarrying, etc., Gravel	Wimborne and Cranborne R.D.C.	R. T. S. Seymour, Surveyor, Wimborne Minster	do.
*Painting, etc., 62-68, Fuller-street, Bethnal Green		W. Brick, North-street, Horsham	do.
Materials	Bingham R.D.C.	R. H. Beaumont, Clerk, Market-place, Bingham	do.
Concrete to Footways	South Shields Corporation	S. E. Burgess, Borough Engineer, Chapter-row, South Shields	do.
Infectious Diseases Hospital, Alvaston	Nantwich Joint Hospital Board	C. E. Davenport, Architect, Nantwich	Mar. 10
*Works to Church, Walton-le-dale	The Committee	The Vicarage, Walton-le-Dale	Mar. 11
Church, Spiddal, co. Galway	Rev. M. D. Conroy, P.P.	W. A. Scott, A.R.I.B.A., 72, Hollybank-road, Drumcondra, Dublin	Mar. 12
*Engine Shed and General Depot	Romford R.D.C.	Council's Surveyor, Victoria-chambers, Romford	Mar. 14
Roof Boarding & Painting, Purifier House, Great Float	Wallasey U.D.C.	J. H. Crowther, Engineer, Gasworks, Great Float, near Birkenhead	Mar. 17
*Heating Aparatus to Library	Branksome Public Library	S. J. Newman, Branksome	Mar. 18
Covered Service Reservoir	Chelmsford Corporation	C. Brown, A.M.Inst.C.E., 16, London-road, Chelmsford	Mar. 28
2,253 Yards c.i. Pipes	do.	do.	do.
Pipe Laying	do.	do.	do.
Repairs and Painting to County Buildings, etc.	Northumberland County Council	J. A. Bean, County Surveyor, The Moot Hall, Newcastle-on-Tyne	No date.
Annual Contracts	Wimbledon U.D.C.	Council Offices, Wimbledon	do.
Provision Stores	Birkenshaw Industrial Soc., Ltd.	A. T. Verity, Architect, Birkenshaw	do.
Four Cottages, Weybridge (labour only)		T. Atkinson, 10, Clifton-road, Kingston Hill	do.
Jetty and Sheds, on River Tivy, Cardigan Bridge		Secretary, Western Counties Co-operative Assoc., Ltd., Plymouth	do.
*Supplies	Paddington Borough Council	Borough Surveyor, Town Hall, Paddington, W.	do.
*New Boy's School, Spennymoor	Tudhoe (U.D.) School Board	F. H. Livesay, Architect, Bishop Auckland	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Sanitary Inspector	Woolwich Borough Council	120*l.*	Feb. 27
*Surveyor's Assistant	Romford R.D.C.	2*l.* 2s. per week	Feb. 29
*Architect's Assistant	Sheffield Corporation	Not stated	No date.
*Engineer	do.	Not stated	do.
*Assistant Surveyors	Admiralty	150*l.*	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xviii.

TENDERS.—*Continued from page* 209.

LONDON.—For foreman engineer's house at the central station, Long-grove Asylum, for the London County Council :—

Charles Wall £831

LONDON.—For the erection of Guardians' offices, etc., at Camberwell, for the Guardians of St. Giles', Camberwell. Mr. Edwin T. Hall, architect, 54, Bedford-square, W.C. :—

Patman & Fotheringham	£22,200	Holliday & Greenwood	£20,677
Holloway Bros.	21,648	Gough & Co.	20,554
G. Parker	21,647	Higgs & Hill	20,474
Foster & Dicksee	21,234	H. L. Holloway	20,137
Balaam Bros.	21,150	F. & H. F. Higgs	20,060

LONDON.—For electric light extension at the Marshall-street Baths and Washhouses, for the Westminster City Council :—

Tamplin & Co.	£405 0 0	Taylor & Co.	£263 0 0
Rider & Co.	359 7 0	Bakewell & Co.	258 11 0
The District Electric Co.	269 0 0	Bromley & Co.	236 3 0
Jackson Bros.	265 0 0	Potter & Sons*	178 0 0

LONDON.—For sinking a preliminary boring in connexion with the deepening of the present well on the Long-grove Asylum estate, with a view to obtaining an increased supply of water, for the London County Council :—

Thomas Docwra & Son £933

LONDON.—For the erection of the watchman's shelter and tool and potting shed at the central garden, Millbank estate, Westminster :—

Spencer, Santo, & Co. £295 13 0

LONDON.—For works at the epileptic colony, for the London County Council :—

Fitting up Laundry : W. Summerscales & Son £1,369 14 6

Heating Apparatus in Store and Single Room in Two of the Villas : Geo. Wright & Sons 104 10 0

Fitting up of Padded Room : Pocock Bros. 87 10 0

TENDERS.—*Continued on page* 212

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LONDON.—For the erection of (1) stables, and (2) disinfecting station at Digby-street, for the Bethnal Green Borough Council:—

	Stables.	Disinfecting Station.
T. Almond & Sons	£7,300 0	£2,998 0
E. Brown & Son	7,497 10	3,095 0
W. G. Brown	—	2,926 0
J. Dolman & Co.	6,983 0	2,726 0
R. & E. Evans	7,356 0	2,915 0
J. Ferguson & Co.	7,090 0	2,837 0
Foster Bros.	6,988 0	2,837 0
F. Gough & Co.	7,094 0	2,890 0
J. Haydon & Sons	7,879 8	3,070 18
F. & H. F. Higgs	7,350 0	2,975 0
H. L. Holloway	7,184 0	2,842 0
Henry Kent	7,225 0	2,879 0
S. Kind	—	3,500 0
Knight & Son	6,927 0	2,762 0
W. Lawrence & Son	6,984 0	2,894 0
R. A. Lowe	7,623 0	2,999 0
William Mills	8,018 0	3,097 0
Albert Monk	7,398 0	2,998 0
S. E. Moss	6,950 0	3,000 0
B. E. Nightingale	6,989 0	2,784 0
Charles North	7,283 0	2,979 0
Sheffield Bros.	7,277 0	2,998 0
J. Shillitoe & Son	7,150 0	2,850 0
Terry Building Co.	7,300 0	3,000 0
W. Thomerson & Son	8,550 0	3,400 0
Todd & Newman	Irregular.	Irregular.
G. Wales & Co., Ltd.	8,340 0	3,612 0
L. Whitehead & Co., Ltd.	7,310 0	2,943 0
Wilkinson Bros.	7,448 0	3,052 0
F. Willmott	7,449 0	2,995 0
F. & F. J. Wood	7,640 0	3,043 0
C. Yates & Co.	7,323 0	2,978 0
J. Appleby & Sons, Cornwall Works, Lambeth, S.E.*	6,730 0	2,720 0

MAXSTOKE (Warwickshire).—For the erection of an entrance lodge and a coachman's cottage at Maxstoke Castle, near Coleshill, Warwickshire, for Mr. Beaumont T. Fetherston. Mr. Charles M. C. Armstrong, architect, 5, High-street, Warwick:—

E. A. Isherwood	£1,445	Kelley & Son	£1,340
G. F. Smith & Sons	1,434	C. Hope, jun.	1,300
Isaac Langley	1,424	F. Davis, Moseley†	1,275

MELKSHAM.—For sewering and sewage disposal works, including settling tank, filter, engine house, etc., for the Urban District Council. Mr. Sydney Howard, Engineer, Bradford-on-Avon:—

Johnson Bros.	£14,191 6 6	Bugbird & Seagrim	£10,093 5 9
F. W. Trimm	13,272 0 0	G. Rutter	10,082 16 0
T. Free & Co.	12,316 0 0	H. Brown	9,966 0 0
Wills & Son	12,190 0 0	S. Wood	9,450 0 0
H. & C. Spackman	11,400 0 0	Johnson & Langley	9,321 6 0
E. Ireland	11,224 1 1	J. Jackson	8,800 0 0
J. W. Dean, Ltd.	11,148 1 9	A. S. Morgan & Co., Newport, Monmouth*†	8,790 0 0
H. Roberts	11,000 0 0		
S. Ambrose	10,682 8 10		
J. Riley	10,453 0 0		

† £20 was included for extra printing, which is not included in the other tenders.

MERTHYR.—For erecting two shops in High-street, for Mr. A. J. Howfield. Mr. C. M. Davies, architect. Quantities by architect:—

Evan Jones	£1,581 0	S. Hawkins	£1,107 0
E. L. Sullivan	1,236 16	M. Warlow, Merthyr*	1,080 0
John Williams	1,217 6		

MIDSOMER NORTON (Somerset).—For alterations and additions to Town Hall premises, for the Urban District Council. Mr. W. F. Bird, C.E., Surveyor. Quantities by Surveyor:—

Wills & Sons	£966 0	W. A. Catley, Midsomer Norton*	£841
W. J. Heal	840 10		

[Engineer's estimate, £831.]

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ESTIMATES GIVEN FOR EVERY DESCRIPTION OF ROAD MAKING.

MORLEY.—For erecting a rag warehouse and stables in Townend, for Messrs. H. B. and J. E. Banks. Messrs. T. A. Buttery and S. B. Birds, architects, 1, Basinghall-square, Leeds:—

Builder: N. & H. Sykes, Westfield-road Morley*	£569 0 0
Joiner: Albert Furness, Morley*	498 0 0
Plumber: William Anty, Morley*	83 0 0
Plasterer: Edward Wilson, Morley*	34 0 0
Slater: John Atkinson & Son, Morley, Leeds*	54 12 0
Ironfounder: Newsum, Askham, & Co., Batley, Carr*	130 0 0

PORT GLASGOW.—For causewaying, etc., Anderson-street and eastern part of Castle-road, for the Town Council. Mr. James Murray, Burgh Surveyor. Quantities by Surveyor:—

A. A. R. Lang, Greenock*	£402 7 6	Anderson-st.
" "	455 17 1	Castle-road.

RADCLIFFE (Lancs.).—For paving, flagging, etc., part of Wilton-street, for the Urban District Council:—Fletcher, Bailey, & Co., Summit Inn, Heywood.* By schedule.

SOUTHEND-ON-SEA.—For painting exterior of the pier pavilion, for the Corporation. Mr. E. J. Elford, Borough Engineer, Southend:—

Ryan & Belding	£295 0 0	Sawley & Beckwith	£166 0 0
Edmund Searey	275 0 0	J. W. Westwood Southend*	165 10 0
M. White	220 0 0	R. Athey	149 0 0
J. Carter & Co.	200 0 0		
Vigor & Co.	195 0 0		
T. H. Fuller & Co.	167 11 8		

[Surveyor's estimate, £135.]

STRATHSPEY.—For water supply works, Knockando-Glenlivet Distillery, Dalbeattie. Mr. C. C. Doig C.E., Elgin:—

J. R. Petrie, Aberlour	£305 17

TEDDINGTON.—For making-up, etc., of portion of Kingston-lane, for the Urban District Council. Mr. M. Hainsworth, Surveyor, Teddington:—

S. L. Brice & Sons, Rochester*	£342 4 2

Sixteen other tenders received.

WINKFIELD (Windsor). — For alterations and additions to Forest Farm, for the Duke of Newcastle. Plans prepared in the Newcastle estate office:—

Hollis & Sons	£6,549	G. Brown	£5,200
B. E. Nightingale	6,140	W. Watson, Ascot*	5190
Holloway Bros., Ltd.	5,950		

W. H. Lascelles & Co.

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The Builder.

VOL. LXXXVI.—No. 3186 FEBRUARY 27, 1904.

ILLUSTRATIONS.

Design for a Crescent:—
Perspective View
Plan, Elevation, and Detail ..... By Mr. Robert Atkinson.
Two Premiated Façades, Paris ..... M. Nénot and M. Hodanger, Architects.
"The Gables," Clapham Common ..... Mr. T. Leonard Williams, Architect.

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The Institute and the London Building Act.—II.

IN section 54, as to recesses and openings in walls, the Institute Committee suggest striking out the words in the last paragraph "with respect to the area of recesses and openings," the effect of which is to leave the district surveyor power to make any modification in the requirements of the section in special cases. It does not make much difference in the effect of the section. They do not suggest any improvement in the wording of clause *b*, which is, as we have before pointed out, ambiguous and open to two interpretations. Nor do they suggest a correction of the anomaly that in this section a recess is not to come "within 13½ in." of the external walls; while in section 60, on chases in walls, a sentence with precisely the same intention reads "13 in." It is certainly odd that such obvious discrepancies should have escaped all notice from a revising committee.

In the important section 56, "Rules as to Bressummers," the Committee propose to delete, why, we know not, clause 2, providing for room on the bearing pier for the expansion of a metal bressummer. Is expansion of metal beams to be forbidden under the revised Act? Then they add at the end of clause 1:—

"Provided that any bressummer of metal may be supported solely on a sufficient metal stanchion embedded in the party or external wall so that such stanchion shall not be nearer to the centre of a party wall than 4 in. and in such case no pier in addition to the party wall shall be required."

This is certainly not in the direction of sound construction, as it deprives the wall of the strengthening from a projecting pier. It is obviously inserted merely to render it easier to provide large openings in the wall. The iron standard may be admitted to provide adequately for the vertical weight on the bressummer, but it does not strengthen the wall in the same way as a pier; nay, more, the allowance for the expansion of a metal bressummer having been deleted, it provides, under circumstances of expansion, a lever for throwing the wall out of perpendicular. Clause 4 is proposed to be deleted, and another one substituted, for no sufficient reason, as all the alteration that is really proposed is to add "vitrified stone-ware" to the allowable materials for a template or corbel. The really serious defect in the section, which specifies a bearing of 4 in. on the wall for any bressummer, independent of its length, is passed over without notice. Yet it is almost a truism in structural theory that the bearing on the wall should have a proportionate relation to the length of the beam. A bearing sufficient for a beam of 10 ft. span is not sufficient for one of double the span—an elementary principle entirely neglected in the section, and apparently equally neglected by the Committee.

In section 59, "Height of Party Walls Above Roof," an addition is proposed, providing that in a building other than of the warehouse class, and "where the roof is wholly constructed of fire-resisting materials," the party wall shall be carried up a thickness of 8½ in. "to the underside of such roof surface," instead of 15 in. above it. There has been much objection raised by some architects to the appearance of the wall carried above the roof, and in the case supposed, where the roof is entirely of fire-resisting materials, the proposed provision may be sufficient.

In section 61 (4) the suggested substitution of 85 degrees with the horizon for 75 would make the roof practically almost a continuation of the wall line, and in view of light and air to streets is very objectionable. It runs in the same direction as so many others of the suggested alterations, to enable a building-owner to make the utmost out of his own property, independent of considerations of the general good or of the best structural conditions.

Some minor alterations are suggested in section 64, which present nothing for criticism, but the Committee have not thought of inserting the provision that a chimney-bar should be "straight"; a curved chimney-bar, if any real strain came upon it, is not a tie at all, and would merely give. But in London, "whatever is, is right"; it is the custom to make chimney-bars curved to the line of the arch, and builders would be astonished if you told them it was unscientific. In some parts of the country, at all events, they know better. We can see no sense in limiting the projection of the hearth-stone to 12 instead of 18 in.; it is, in fact, too little for safety, in a wood-floored building. In clause 18, providing that a flue shall not be built against a party structure "unless surrounded with new brickwork at least 4 in. in thickness," the Committee propose to strike out "new." It was a very

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wholesome provision, for it ensured that the party wall side of the flue should be reset instead of being left to the chances of old brickwork. The alteration is surely (again) in the direction of cheapening building operations; unless, indeed, the Committee did not realise why "new" was inserted. The inaccurate 4 in. is passed over without comment; but a properly edited Building Act should really make up its mind what size it considers a brick to be, instead of ringing the changes between "13 in." and "13½ in." and "4" or "4½" in.

In section 66, "as to fires and pipes for conveying vapour, etc.," it is proposed in clause 4, "a pipe conveying heated air or steam shall not be fixed," etc., to insert after "heated air" the words, "other than air heated by hot water at low pressure"; thus giving greater facility for conveying warmed air from coils. In section 67 an omission is supplied by the insertion of the words "or roof," the present section mentioning "a floor over" only, which might give opening for evasion of the true object of the section.

It is proposed to reduce the height of "habitable rooms" (section 70) to 8 ft., instead of the present 8 ft. 6 in.—an undesirable change; 8 ft. 6 in. is quite low enough. In clause *d* "every room next the ground" is substituted for "every basement room," an improvement in definition. The other alteration, that any staircase to rooms over a stable shall be separated from any stable which it may adjoin by a brick wall "not less than 4½ in. in thickness," instead of the present "not less than 9 in.," we entirely disapprove.

In section 73 "fire-resisting" is rightly substituted for "fireproof," and the Committee have made one step towards a recognition of the architectural importance of bold cornices by proposing, after the limitation of the cornice to 2 ft. 6 in., the addition of the words "except in streets 60 ft. wide and over where cornices may be projected not more than 3 ft. 6 in. over the public way." Even to this there ought to be added a discretionary power for special cases. The Committee seem to have been entirely blind to the absurdity of clause 3, by which a shop-front cornice may project for 18 in. "over the ground of the owner of the building," but no part of the shop-front other than the cornice "shall project over the public way." Is it to project "over the public way" or "over the ground of the owner"? Or is "over" used in two different senses in the same sentence? Moreover, any shop-front may "project" 10 in., but no part of the shop-front except the cornice may project over the public way. Then what does it "project" over or what does it "project" from? If it projects from the front of the building line it *must* project over the public way; and if it is within the building line the permission is unnecessary. This is one of the most absurd and ill-worded clauses in the whole Act, and the Committee pass it over without a remark. Equally absurd is clause 4, which provides that no part of the woodwork of a shop-front shall be placed nearer than 4 in. to the centre of a party wall or the face of an adjoining wall, unless there is a pier or corbel of uncombustible material, 4 in. wide, between it and such centre or face of the wall. That is to say, the woodwork cannot come nearer than 4 in. unless there is corbel 4 in. thick between it and the guarded point; then how *can* it come any nearer than 4 in.? But this absurdity escapes the Revising Committee entirely! They seem to be equally blind to the confusion of wording or of meaning in clause 5, which we pointed out when the Act was first published. In a street at least 40 ft. wide, or to a building the front wall of which is at least 40 ft. from the opposite boundary of the street, the owner may add a bay window projecting 3 ft. "on his own ground." If he has 3 ft. to build on, and his front wall is 40 ft. from the opposite boundary of the street, then the street is only 37 ft. wide, and the whole conditions fall to the ground. To make this still clearer (or shall we say still more confused?) it is enacted that the front of the bay window shall not come within "the prescribed distance" from the centre of the street. The prescribed distance is 20 ft., so that in a 40-ft. street it must come within the prescribed distance in any case. It seems incredible that such a clause should have been drafted, but that its absurdity should be passed over by a Committee engaged in improving the Act seems still more extraordinary. The only alteration they suggest in this sub-section 5 is to omit clause *a* entirely. This limits the bay to three stories high, and is, no doubt, unnecessary, for the bay cannot be higher than the front, and there is no reason why it should not be as high. But the section is absolutely unworkable by its own wording, and the Committee seem to have been quite unconscious of this.

In sub-section 6, concerned with oriel windows or turrets, the word "balconies" is rightly inserted, and it is proposed to alter clause *a* so as to read that the limitation of the projection of such features shall be exclusive of "mouldings or other architectural features." Mouldings is quite right, for we know about what their projection is likely to be, but "architectural features" we should imagine would be found rather vague by the authorities, though we see no objection to its intention. From clause *e* it is proposed to delete the words after "district surveyor," which permit of an appeal to the superintending architect. This we think is only reasonable, especially if the district surveyors are again to be practising architects; the surveyor ought to have power to settle such a matter. In respect to this part of the section, a definition of oriel windows is added:—

"An oriel window is any projecting window corbelled out from an external wall, or the masonry of which does not extend downwards to the level of the ground."

This might be improved; the word "or" is superfluous, and if it was intended to provide for some other way of projection than "corbelling" properly so called, it should have read "corbelled out or projecting from." "Down," in this connexion, would be better English than "downwards."

Section 74 the Committee propose to delete and to substitute a much more precise and extended one, including eleven separate clauses. This is one of their best contributions to the subject, and is a decided improvement on the existing section. It is too long for us to quote here in full. The principal new elements are these. Instead of the present clause 3, enacting fire-resisting construction for buildings more than twenty-five squares in area containing separate sets of offices, etc., the new clause (2) provides that all such buildings exceeding 40 ft. in height, and ten squares in area, shall have the tenements separated horizontally by floors or arches of fire-resisting materials; the remainder of the clause repeats the present clause 3. The suggested clause 4 provides that no building containing separate tenements shall, without consent in writing of the Council, extend to more than fifty squares in area unless floors, principal stairs, and supporting walls are of incombustible materials. Clause 5 repeats the main provisions of the existing clause 2, with the addition of the proviso that partitions and floors are to be of fire-resisting materials "other than wood" (the reason for this appears later), and that stairs are to be of fire-resisting materials, and passages and approaches enclosed with fire-resisting materials other than wood. The only mistake here is applying "other than wood" to the stairs, since the fact is that there is no kind of stair more fire-resisting than thick solid oak steps, or safer for use after being exposed to heat. Another clause provides that staircases and passages of approach be at least 3 ft. wide. Between the termination on the ground floor of the stair of access and the street there is to be a passage enclosed and constructed as fire-resisting, unless means of escape are provided to the satisfaction of the Council from the side, rear, or roof of the building. Another clause provides that, "except for the purpose of a party-structure separating buildings," nothing in this section shall prevent the use of solid wooden joists placed close together, or wooden joists in connexion with fire-resisting pugging 5 in. thick, for fire-resisting floors. The intention is obvious, but there is a confusion of terms in referring to a "party structure separating buildings"; it should be "separating tenements"; the whole is the "building"; the object is that separate tenements should be divided by a floor "other than wood." The first clause, we observe, repeats the unnecessary verbiage of the present first clause—"from the adjoining building (if any) or from each of the adjoining buildings (if more than one)." "From the adjoining building or buildings (if any)" would have covered the whole conditions more neatly. But in the main this is a very good section, and we wish all the Committee's suggestions had been equally satisfactory.

In section 76 it is proposed to delete clause 1, which prescribes party walls, in a warehouse building allowed to exceed the usual dimensions, limiting each division to 450,000 cubic ft. This is perhaps right, for where in a very large building unbroken floor space is required, the division by party walls might neutralise the whole value of the extended size; and it is to be presumed that such a building would only be allowed subject

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to the most stringent conditions as to fire-resisting construction.

The Committee delete section 77 and substitute a new one, for no very obvious reason, as the new one does not differ much from the existing one, except by the addition of a clause which provides for buildings being united in whole or in part if the portions in separate occupations are separated by a floor 8 in. thick. At the commencement of this new section, however, like the Irishman's wife who told him of her debts, "Their mind is wandering again," and this is how the section commences :—

"Buildings shall not be united except under the following conditions :—

"(1) If when so united and considered as one building only they would not be in conformity with this Act."

We presume they meant to say exactly the opposite; but that is how it stands.

In section 78, "Construction of Public Buildings," it is proposed to interpolate the following passage into the first sentence: after the words "or in the event of disagreement may be determined by the Tribunal of Appeal," to place a full stop, and to read on :—

"For the purposes of this section the district surveyor or in the event of disagreement the tribunal of appeal may in his or their discretion vary or depart from any of the enactments in this Act as to the construction of buildings that may appear to him or them necessary or desirable to suit the special circumstances of the case of any public building or any one or more of a series of public buildings or their accessories or connexions within one curtilage and save so far, etc., etc."

The remainder of the sentence standing as at present. After this sentence the word "but" ought to have been substituted for "and," to make it read logically: "but save so far," etc.

In section 80 it is suggested (and we agree) that the prescribed width of staircases ought to apply also to doors, taking the full width of opening clear of the thickness of the opened doors.

In section 90, on "rights of adjoining owners," it is proposed to substitute in line 7, for "any party fence wall," "any external or party fence wall," which is requisite to cover cases where the adjoining owner's wall may not be legally a party wall. In clause 4 it is suggested that twelve months instead of six months should be the time for the expiration of a party wall notice; in this also we agree.

In section 91 (10) it is suggested that instead of "a Secretary of State" it should be "the President for the time being of the Royal Institute of British Architects" who should select a third surveyor; which is in every respect more suitable.

In section 93 (1) it is suggested that the two months' notice of a building owner to the adjoining owner in regard to works which may affect the latter, should be reduced to "one month," and in this we concur; a month is quite sufficient for all reasonable requirements. In clause 3 it is proposed to strike out "inconvenience" as a reason for compensation, in which also we agree; "inconvenience" is a very vague term, of which almost anything may be made; and hardly any new buildings can be carried on without a certain degree of inconvenience to some one. In section 95 (*d* 4) the Committee seem to have hit on a mistake in wording in the present Act. In the sentence "if any footing, chimney breast, jambs, or floor be cut away," they suggest for "floor" read "flue," and probably this was really what was intended. On the other hand, the proposal to strike out the words "as aforesaid" in the second paragraph of 95 (*f*) seems quite illogical. The reason given is that by those words, referring to a previous clause in the section, "only buildings erected after 1894 are affected." But that is probably what was intended; it was not to be retrospective legislation.

In section 96 it is proposed that "six months" should be substituted for "one month" as the period within which the building owner is to furnish the adjoining owner with an account of the expense which is to be borne by him. It is rather a large alteration; but one month was certainly too short, considering how much unavoidable delay there often is making up building accounts.

After this the report skips to Part XII. of the Act: "Sky signs," of which it is remarked that it "requires revision to bring it up to date," but on what ground is not stated, nor do we see any. In Part XIV., section 164, it is suggested (and with good reason) that the advertisement of intention to apply for authority to make new by-laws should be required to be published in the *Times* "and at least four other London daily or weekly papers," as well as the present requirement of the *London Gazette*, which constitutes rather an official than a real publication. And we concur also in the suggestion that section 198—"Proceedings with respect to a building shall not be affected by removal or falling in of the roof or covering of such building"—should be "more explicit." As it is, it is rather difficult to understand why it was inserted or what its precise intent is.

In regard to the second schedule ("Fire-resisting materials"), it is rightly suggested that as a number of new fire-resisting materials are now available, the list ought to be extended. On the other hand, we may ask, ought granite and some other stones to be still regarded as "fire-resisting materials"? They are incombustible, no doubt; but, as observed in our last article, "incombustible" is a perfectly different thing from "fire-resisting"; and the faculty of stone for splitting under heat, and its dangerous quality in that sense, are so well known now that it seems almost unsuitable that it should still be scheduled under fire-resisting materials.

Two entirely new appendixes are suggested to the Act: one in regard to the pier construction of buildings, the other in regard to the regulation of "skeleton buildings"—*i.e.*, the American type of steel-framed structures, which we hope may not be adopted here to any extent; but as it is a form of structure that is attracting attention, it would be well to have it prepared for in the Building Act. This appendix has been very carefully made, and seems calculated to ensure sound construction in this type of building. The appendix relating to piers is a praiseworthy and, on the whole, successful endeavour to reduce to rules, to meet all cases, the required thickness and width of piers in walls. For the width the general rule given is that the collective width of the piers on any wall shall be at least one-fourth of the collective length of the piers and wall taken together—*i.e.*, in a wall 80 ft. long there may be four piers each 5 ft. wide, or eight piers each 2·6 ft. wide, which is a fairly liberal allowance. The provision that "any pier may be discontinued for any portion of its height," provided that the remaining piers are proportionately strengthened, is too vague in its wording, as anyone will perceive who tries to define what could be done under that wording. "Any pier" might be twisted into meaning every one. The permission, however, is subject to the "satisfaction of the district surveyor," as well as the bressummer to be employed to bridge the gap.

There are, it will be seen, some useful suggestions in the Report of the Committee of the Institute; but with the exception of these two last-named appendixes, they are mostly on small points, and they show a general tendency not so much to make building better as to make it cheaper and more convenient. Many weaknesses of drafting are passed over without notice, the Committee having apparently no eye for such points. But the most serious defect is the total want of large views as to the architectural requirements of building in a capital city, and the failure to take the opportunity to suggest any such. The circle of ideas included under the term "Professional Practice" is not one that tends to enlarge men's views on architectural subjects, and the Committee of the Institute made a mistake in delegating the task to the Practice Standing Committee. They should have appointed a small special Committee of, say, four eminent architects and two eminent surveyors to consider the Improvement of the Building Act, and they might then have had a Report and suggestions more worthy of the Institute and of the occasion.

NOTES.

Commission on London Traffic.

THE Royal Commission on London Traffic have taken a wise course in appointing technical experts to advise them upon various important questions connected with locomotion and transport in the Metropolis. Three eminent engineers have been nominated by the Commission—Sir John Wolfe Barry, one of the Royal Commissioners, Sir Benjamin Baker, and Mr. W. Barclay Parsons, a well-known American engineer associated with the Rapid Transit Commission of New York. It would probably be difficult to name any three men better qualified for the task now to be taken up. Sir J. Wolfe Barry has already taken considerable interest in the traffic problem, and his statesmanlike methods are sufficiently familiar to our readers; Sir Benjamin Baker is probably the best living authority on constructive engineering work, and is gifted with an unusual capacity for dealing with practical problems; while Mr. Parsons will bring to the aid of the Commission the proverbial keenness of the American engineer and an intimate acquaintance with methods of dealing with difficult traffic problems in the

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United States. The Committee have taken much evidence relative to proposals for the improvement of traffic conditions in the Metropolis, and the duty of the experts appointed will be to report upon the engineering and other features involved in such schemes. The appointments now made should have the effect of hastening the completion of the report to be made by the Commission—a consummation much to be desired, as at present all legislation dealing with traffic facilities in London is practically in abeyance.

The Responsibility of Street Authorities.

THE recent decision of the House of Lords, relative to the liability of local authorities to safeguard the interests of the public so far as concerns the conditions of the streets under their control, is certainly to be commended. The facts of the case in point have already been reported in full detail by the daily papers. Nearly four years ago a heap of earth was deposited on the carriageway of a street in Shoreditch during some sewer construction. As this obstacle was left without a light, it happened that in the evening a hansom cab was overturned, injuring the occupant and driver. The injured occupant then raised the contention that the corporation were liable for the consequences of their oversight. After protracted litigation the Lord Chancellor has finally decided that the local corporation were responsible. As not infrequently happens, the various courts by whom this case was successively considered arrived at totally different conclusions, and it is a matter for congratulation that the final decision of the House of Lords is fully in accordance with the dictates of commonsense. To the lay mind the matter appears to be perfectly simple, for it has been admitted throughout that the corporation neglected to take the very simple precaution of placing lights upon the offending mound of earth, and it is a very elementary axiom that people who cause injury to others by neglect, or in any other way, should be held responsible for the consequences.

Parliamentary Committees.

THE evidence of Mr. Gray, the counsel to the Chairman of Committees of the House of Lords, given before the Royal Commission on London Traffic again draws attention to a point which was also brought forward in the Blue Book issued by the Select Committee of the House of Commons, upon which we commented in our issue for January 17 last year, viz., the lack of any continuity in the policy of committees in their consideration of opposed Bills. So far, we believe, no steps have been taken to carry out the recommendations of the Select Committee on this subject, but the piecemeal policy in dealing with local and private matters is disastrously illustrated in and around the Metropolis. In some cases large monopolies have been granted, as in the South-Eastern and Chatham Railway amalgamation; whereas in other instances—for example, the Underground Railway schemes—competition has been favoured where a certain amount of combination would have increased efficiency and saved expense. Mr. Gray suggests special committees for metropolitan affairs being formed as far as possible of the same members. Many practical difficulties seem involved in attaining this end; but the question should receive the early attention of Parliament, and the recommendations of the Select Committee should not merely be relegated to a pigeon-hole.

The Smoke Nuisance in London.

JUST as a number of small raindrops make a shower, so a number of small chimneys create clouds of smoke in London, and until private dwelling-houses are prevented from discharging black smoke the atmosphere of London will not be appreciably improved. Still, half a loaf is better than no bread, and the recently reported case of McNair *v.* Baker is an authority that, for the purposes of the Public Health (London) Act, 1891, sect. 24, a club-house is not a private dwelling-house, and, therefore, cannot legally send out "black smoke in such quantities as to be a nuisance." In other words, the section must be construed strictly, and a private dwelling-house only can have this privilege so detrimental to the community. A club-house is not a place of business, and for social purposes it has some of the attributes of a private dwelling-house, but in fact it is not one, and not being one, neither the St. James's nor any other club can be allowed to contaminate the atmosphere of London with black smoke.

Sprinklers for Theatre Stages.

IN a recent reference to the prevention of theatre fires in Germany, Herr Lautenschlaeger, formerly of the Prince Regent Theatre, Munich, advocates the use of a sprinkling apparatus first adopted at the Royal Court Theatre in the same city. This seems to be a useful device, as by its means a fire can be extinguished not only at any particular part of the stage, but those parts which have not been ignited can be completely drenched with water, thereby preventing further spread of the flames. In the installation of the Prince Regent Theatre, Munich, the valves connected with perforated water pipes, extending above the entire stage, are controlled by a single lever operating one, two, three, or four valves at once, so that a portion, or the whole, of the stage can be deluged with water. It is said that on one occasion during a performance, in which gun-cotton was used to produce lightning flashes, some gauze clouds were ignited. A fireman promptly pulled the lever, with the result that the scenery and stage were so thoroughly soaked with water that the flames were almost immediately extinguished. It is added that the audience suspected no danger, believing the downpour of water to be a part of the performance. The adoption and use of a device such as this would probably have prevented the recent disaster at Chicago, and the application of some equivalent safeguard ought to be compulsory at all theatres and similar places of amusement.

Photography and the Planets.

IN referring to Mr. Maunder's interesting lecture on the planet Mars at the London Institution a few weeks ago, we asked whether telescopic photography could not do something to clear up the vexed question as to the supposed "canals" on Mars. Lecturing on Mars again at the Camera Club on Saturday last Mr. Maunder, after giving the general argument advanced in his London Institution lecture, touched especially on this subject of photography, and pointed out (what we must admit we ought to have realised) that the planets were in very different conditions in regard to photography from the fixed stars. The latter have practically no motion as far as the eye or the lens are immediately concerned except the apparent motion from the revolution of the earth, and therefore an exposure of two or three hours can easily be secured with a clock-driven telescope, and fixed stars have thus been photographed which no telescope can see. But with a planet there is in the first place its own motion in its orbit to deal with; though it seems possible that a telescope might be geared (as indeed we think Mr. Maunder admitted) to follow the line of movement resulting from the combination of the orbital motion and the celestial sphere motion. But when in addition to that the planet has a tolerably rapid revolution on its axis, it is manifest that only a very short exposure could be obtained for a photograph. The difficulty is rendered still greater in the case of Mars from the peculiar colouring of the planet, in which the lighter parts, being yellowish, would come out dark, and the darker parts, showing a bluish gray, would hardly photograph. In regard to Mars we feel pretty well satisfied that the canal theory is done with now. As Captain Abney said at the meeting, Mr. Lowe's essay on the subject was so fascinating that every one who read it was disposed to believe it—for the next half hour. It certainly fascinated us; but when Mr. Lowe began to see canals on Venus, of which we cannot see the actual surface for the atmosphere, one had to give him up.

Hellenic Society.

THE meeting of the Hellenic Society on Tuesday was an unusually interesting one, but the subject of the principal paper, by Dr. Farnell, comes more under the head of ethnography than of archæology as usually understood. The paper, a very well-reasoned and logical one, was an attempt to show that there was an early incursion of Hellenes into Asia Minor somewhere about the XIVth century B.C., and that this is commemorated in the name Lycia, "Lukeia," as derivable from "Apollo Lukeios," or Apollo of the Wolf; the lecturer maintaining that a cult of Apollo in connexion with the wolf was traceable in early ages, from Argos through Rhodes to Asia Minor. Opinions were divided as to the theory, but of the interest of the paper itself there could be no question. Subsequently Mr. Arthur Smith exhibited on the screen some photographs of a terminal figure of Dionysus Propylæus—"Dionysus of the Gateway"—bearing an inscription to the effect that the original (for this was admittedly a copy) was the work of Alkamenes (450-400 B.C.). Mr. Smith considered the figure was archaistic, *i.e.*, imitation

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archaic of a late date, and, therefore, rather a translation than a copy of Alkamenes' work. But though the conventional arrangement of the hair round the forehead looks archaic, there are not wanting instances of similar treatment in works of an advanced period; and the treatment of the beard, in spite of its square outline, appeared to us to be a great deal too naturalistic in detail to be called archaic. The interest of the matter lies in the fact that the figure appeared to afford a definite piece of evidence as to the work of Alkamenes. Dr. Furtwängler, indeed, claims, we believe, to have identified seventeen examples of the work of this sculptor; but we fear we are sceptical about identifications which rest only on deductions from style.

Royal Academy Lectures.

DR. MURRAY'S second lecture on Thursday, the 18th, was on the interesting subject of Athenian stelæ. The earliest reference to a Greek tomb symbol was the request of Elpenor for a memorial mound with an oar over it. Greek funeral memorials originally referred to the past life of the deceased, but these gradually gave way to speculation as to the future, as shown in an archaic Spartan relief, where a man and his wife were seated together with a serpent carved behind as the emblem of the future life. The flatness of modelling in this example was remarkable, but it was probably completed in colour. This and the figure called the "Warrior of Marathon" (VIth century) showed the rigidity of pose common to archaic work. There were few stelæ of the Pheidian age, perhaps because the Persian war had caused private to be subordinated to public interests. When funeral memorials became more common at a later date they frequently represented parting scenes, sometimes allegorised by the introduction of a well-known history, such as the parting of Hector and Andromache, or Orestes and Electra at the tomb of Agamemnon; not intended as illustrations of the original story, but as symbolical of the parting of friends; the story of Eurydice and Orpheus was used in the same manner. Another common *motif* in the later stelæ was the representation of a woman seated (generally with a maid attendant) and putting on her ornaments. The figures were often placed within a kind of framework suggesting a door with a column on each side; this was the doorway into the future life, as had been rendered clear by an example in the British Museum, where there was an inscription which might be freely translated—"This way to the Blessed." Dr. Murray showed an interesting late stele, partially defaced, of a figure of a youth, in which the drapery was treated rather as if derived from a bronze than a marble style; the general design and the sentimental type of figure seemed to indicate the influence of Lysippus. Referring to the stelæ of the Athenian burial ground which were still *in situ*, Dr. Murray observed that they showed a change in the personal type represented; the heads were smaller, and personal attraction in the figures seemed to be more aimed at, and the drapery was treated as if thinner and lighter than the broad folds of the older Greek drapery. The same style was to be seen in figures on the temple of Nike Apteros. An equestrian relief from the tomb of Dexilios was an interesting example of the manner in which such a subject was treated; Dexilios was really killed in the battle, but the stele did not represent this; it represented him successfully attacking an enemy. A curious example shown was a stele with a large amphora in relief supported by a twin sphinx; the amphora represented a bridal vase, but the symbolical meaning of it (contrary to what one might expect) was that the person commemorated was unmarried. In concluding his lecture, Dr. Murray remarked how much the feeling of these tomb reliefs, with their very restrained emotional expression, recalled that which was met with in many fragments in Greek anthology.

Royal Academy Lectures (continued).

DR. MURRAY'S third lecture on Monday afternoon dealt with the subject of sculptured pedestals. These were frequently adorned with bas-reliefs referring to events in the lives of the persons represented in the monument. Thus there was the monument to Polydamas, the athlete, with reliefs representing four of his exploits; these were known to have been by Lysippus, an artist who usually worked in bronze; but some fragments of the pedestal reliefs had been found at Delphi, and were in marble, though in a style founded on bronze treatment. Statues of deities were generally without reliefs, as there were no exploits to be celebrated; but the great temple statues of Athene and of Zeus, at Athens, appear to have had carved pedestals, though probably very low ones, on account of the height of the colossal statues. An illustration was shown of a three-sided lofty stele bearing a commemorative statue, the three-sided plan being probably a reminiscence of a tripod of Delphi. One archæological value of pedestals was that they frequently bore the sculptor's name, though, unhappily, there were many pedestals with names on them from which the sculptured figure had been lost. The Greeks were not averse to placing statues on columns, but they were always small columns, not above 15 ft. or so in height; the Romans exaggerated the idea by placing statues on columns so lofty that the statue was lost. The spiral bas-relief relating the exploits of the emperor, however, on the Trajan and Antonine columns was a fine idea; whence did it originate? There was a curious spiral stele of intertwined serpents, now at Alexandria, which commemorated the battle of Platæa, the spirals bearing the names of the States which had sent aid to the Athenians. Here we might find the suggestion of the Trajan column, actual representation being substituted for inscribed names. The sculpture on the Trajan and Antonine columns was of more historical than artistic interest, except in regard to the manner in which a rainstorm, which had saved Antonine's army from drought, was symbolised by a winged figure on the column. The pedestal slabs from Mantinea, now at Athens, and probably the work of Praxiteles, more particularly the Apollo and Marsyas subject, were illustrated. The figure of Marsyas in this relief has a curious and almost humorous expression of endeavour combined with a good deal of anxiety. A relief with the name of Bryaxis was of interest, because it was known that Bryaxis was one of the sculptors employed on the Mausoleum, but there were no fragments of the Mausoleum sculpture which could be identified with him on the ground of special style. A curious feature in chariot pedestals was the occasional employment of animals as supporters where the wheels should have been, figures of Pegasus, for instance, thus supporting a figure of Aphrodite on a pedestal of this kind. Lastly, Dr. Murray drew attention to and illustrated the reliefs on a throne in the Villa Ludovisi, especially that showing a figure (Venus?) rising between two nymphs, who spread out draperies to enwrap her. This was archaic in style; but was it a true archaic? The probability was that it was imitation archaic by a Roman artist of the first century, when there was much imitation of Greek archaic work. The best test in these cases was the drapery, which in archaic revival was more mechanical than in the true archaic, and (as in this case) ignored the distinction between two materials of costume which, as mentioned in the previous lecture, was so carefully observed by Greek sculptors.

Illustrations of the Great Masters.

WE have now before us nine parts of the publication of photogravure reproductions of pictures by the great masters down to the year 1800, which is being issued by Mr. W. Heinemann, to be completed in twenty-five parts, each part containing four large plates with an accompanying commentary by Sir Martin Conway. We noticed Part First on its appearance with all appreciation, and the remaining parts now received more than bear out the promise of the first one. It is a splendid publication, and it may be doubted whether such a fine series of artistic illustrations has ever before been issued at such a moderate price. The choice of subjects is being made with entire catholicity of taste, and represents some of the best works of painters of the most different schools. The photogravures have large margins, and are quite worth framing and hanging up, for those who prefer to treat them in that way.

Monument to Mr. and Mrs. Gladstone.

AT the Turner Studios, Glebe-place, Chelsea, there has been for some days on view the monument to Mr. and Mrs. Gladstone, which Sir William Richmond, R.A., is executing for Hawarden Church. It is at present only a model in plaster, but the marble is to be put in hand at once. Eventually the supporting figures and the reliefs upon the base will be in bronze. The monument is in the mediæval form of a double tomb, husband and wife lying side by side; between them lies the crucifix, with the symbols of the evangelists at the points of the cross. The figures are clothed in simple draperies, Mr. Gladstone in academic robes; the eyes of both are closed as if in sleep. An angel forms a canopy,

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somewhat like a cresting wave, binding over both figures, at the head of the tomb, with outspread wings. At the feet is the symbol of Wisdom. Around the base are figures symbolising the Christian religion; on one side are reliefs from Homer and Dante, on the other reliefs of the womanly virtues of Goodness and Compassion. The whole forms a striking work on a large scale. We hope the finished work will show happier and more refined architectural lines, which hitherto seem hardly to have received much attention; the straying here and there into the forms characteristic of the *art nouveau* does not add to the dignity of the work.

The Society of Painter-Etchers.

THE Exhibition of the Royal Society of Painter-Etchers and Engravers, at the rooms of the Water-Colour Society in Pall Mall East, is as interesting and varied as usual, and there seems to be at present rather a return in favour of genuine line-etching, and a less proportion of the works representing special methods which are only by a *façon de parler* included under the definition "etching," though the addition of the word "engravers" is perhaps intended to cover these. Among line etchings Mr. C. J. Watson's "The Long White Road" and "St. Riquier" (4 and 5) are excellent examples. Mr. A. Hugh Fisher shows his originality in conception of effect by his etching of "St. Etienne, Paris" (19), the upper part only finished and showing white against a nearly black background, the lower portion shaded away into half tint; and his versatility is apparent in the fact that he exhibits also a sheet of heads of tigers (23), which is one of the best things in the room. Mr. Haig shows in "La Madeleine, Troyes" (31) one of his highly worked architectural interiors, which are engravings on copper rather than etchings, and Mr. W. Monk has an excellent series of etchings, in the true sense of the word, of architectural subjects (32 to 36), including a powerful one of Waterloo Bridge seen in sharp perspective, the massive columns of one of the piers forming the foreground objects. Architectural subjects are indeed largely represented in the collection, and generally very well treated. The place of honour at the top of the room is given to some large and effective, but rather coarsely executed, works by Mr. Frank Brangwyn, of which "A Shipyard" (94) is the most effective; but one is tempted to think, in regard to these, that freedom of line is one thing and "scrawliness" (if we may coin the word) another, and that there is such a thing as being too ostentatiously rough in execution, even for so free an art as etching. Mr. Evershed's small and clearly executed views of portions of city scenery (99 to 104) are as good as usual, and a French artist, M. Bejot, contributes two very good London subjects in the same style (73, 74). In this neighbourhood are to be seen two charming little dry-point "marines" by Mr. Wyllie (64 and 70). At the north-east angle of the room are placed Mr. Alfred East's contributions, of which an aquatint under the title "A Clear Evening" (114), with the trees showing in dark masses against a sky of empty paper, is very effective, and represents what this method of work can best accomplish. Further down the room we are struck by the versatility displayed by a lady artist, Miss Mary E. Sloane, in three small subjects (143, 144, and 146), all of a totally different nature, and all equally well treated. "Bayonne" (152) and "Lymington River" (154), by M. Heseltine, deserve special notice; also those by Mr. Goff (187, 188, 192) and Mr. David Waterson, a name we do not remember; his "Dawn" (201) is a very fine little work with a grand sky. Sir C. Holroyd is a large contributor of works on a rather large scale, but of unequal interest; the finest is the "Wood-witch" (174), with its four great trunks of trees against the sky. The special feature usually added to these exhibitions consists of a series of eleven strange, fantastic, powerful engravings by Mantegna, of which the most remarkable is "Christ in Limbo"; there is a truly Dantesque power about this. It is strange to meet with this early Renaissance work in the midst of a collection of modern etchings; it seems to have come from another world of ideas—a world how far removed from that of to-day!

Lithographs by M. Fantin-Latour.

AT the Dutch Gallery in Brook Street is a fine collection of lithographs by M. Fantin-Latour. These are mostly purely ideal works, many of them symbolic illustrations of personages or ideas in romantic opera by Wagner, Berlioz, and Schumann, and Brahms, and one or two references to Rossini—an odd combination with the other names. One would have thought Mozart and Beethoven were worth the same kind of homage from another art. One or two of them are still more abstract; one, for instance, symbolises the Prelude to "Lohengrin," the central figure an angel holding aloft the Holy Grail; another represents "Musique et Poésie." This is a very poetic and intellectual use of the art of lithography, interesting in itself, and all the more so that these ideal scenes represent also a perfect mastery both of the technique of lithography and of the art of pictorial composition. Every drawing in the collection shows the hand of a master. Among the finest are the several love scenes between two figures suggested by Berlioz' "Les Troyens à Carthage," a series of small drawings all remarkable for the composition of figures and landscape; "Manfred and Astarté" (Schumann), a subject treated several times, but most finely in No. 42, where the figure of Astarté is of remarkable beauty; and "Poèmes d'Amour" (46), where again the female figure is of remarkable beauty of drawing and expression. The whole collection represents a remarkable form of art in black and white, in which this artist stands alone.

Illustrations of Old London.

THE Fine Art Society have got together at their gallery in New Bond-street a large and most interesting collection of engravings and drawings of London in the reigns of the Georges, to the number of 275. They are not, in the main, things to be regarded from the artistic or architectural point of view; indeed, many of the engravings of architectural monuments are exceedingly bad, both in regard to perspective and to truth of representation in detail; but in a historical sense the collection is of the greatest interest. It is not often that we have the opportunity of seeing so many illustrations of this kind collected together for study and comparison. Some plans of London at the early Georgian period are also included in the exhibition.

The Modern Gallery.

AT the Modern Gallery in New Bond-street is a collection of landscapes in oil and water-colour—mostly the former, by Mr. T. W. Allen. Many of these are very pleasing landscapes, though it cannot be said that the author has any distinctive style. There is a certain old-fashioned character about some of them, such as the small "Springtide" (106), which looks as if it might have been painted by Nasmyth. The largest picture, "The Queen's Sunset: Jan., 1901" (77), is fine in intention, but hardly realises its aim. Want of force in the foreground seems to be failing here and in other works. Among those which show more breadth and unity are "A Surrey Heath" (18), "From Darkness to Dawn" (22), a delicate effect of morning light; "A Tranquil Evening," water-colour (30), "A Surrey Landscape" (41), also a water-colour; "Russet, Brown, and Saffron" (46), and "A Surrey Cornfield" (57).

Herne Hill Free Library Competition.

THE Libraries Committee of the Lambeth Town Council seem to have some peculiar ideas as to the conduct of competitions. In respect of the competition for a Library at Herne Hill, it having been recommended that the plans of Messrs. Wakeford and Sons be accepted, Councillor Cook demurred, and thought the plans ought to be submitted to an independent arbitrator, and subsequently Councillor Evans moved that the designs should be submitted to an architect to be nominated by the President of the Institute of Architects. The Committee, he said, had themselves raised a suspicion as to the selection of the plan, and, in fairness to the other architects, there should be an independent opinion. This excellent advice was duly seconded, and opposed by Councillor Johnson, the Chairman of the Libraries Committee, who said their librarian was the best judge of the plans, and that if they had an independent assessor they would not be likely to get so impartial a result. "A member of the Society of British Architects (*sic*) might well have a favourite pupil, or know a friend with a favourite pupil, who had submitted a plan." This impudent suggestion appears to have been quite to the taste of most of the members of the Committee, who passed the acceptance of the original recommendation by a large majority.

THE SURVEYORS' INSTITUTION.—Our report of the last meeting of the Surveyors' Institution is unavoidably held over until next week.

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THE ARCHITECTURAL ASSOCIATION.

AN Ordinary General Meeting of this Association was held on Friday last week in the Meeting-room of the Royal Institute of British Architects, at No. 9, Conduit-street, Regent-street, Mr. H. T. Hare, President, in the chair.

The minutes and some nominations having been read, the following gentlemen were elected members, *i.e.*, Messrs. F. J. Whittingham, Wrexham; C. Simpson, Putney; T. O. Foster, Ealing; G. F. Lake, Stroud Green; L. M. Gotch, West Ealing; H. V. German, Streatham Hill; I. H. German, Streatham Hill; D. J. Campkin, Sutton, and T. L. Pearce, Westminster.

New Premises Fund.

The President then announced the following further donations to the New Premises Fund:—Proprietors of the *Builders' Journal*, 10*l.* 10s.; Messrs. C. Stanley Peach, 10*l.* 10s.; W. Morrison, 10*l.*; J. D. Crace, 5*l.* 5s.; W. H. Lever, 5*l.*; F. Adams Smith, 2*l.* 2s.; Horace Porter, 2*l.* 2s.; T. S. Attlee, 1*l.* 1s.; L. V. Hunt, 1*l.* 1s.; W. J. Kemp, 1*l.* 1s.; C. H. M. Mileham, 1*l.* 1s.; J. B. Pinchbeck, 1*l.* 1s.; and A. H. Roe, 1*l.* 1s.

Mr. H. Tanner, jun., Hon. Secretary, proposed a vote of thanks, which was accorded, to Mr. J. L. Williams, for allowing a party of members to visit his three houses on Saturday, February 6.*

Mr. Louis Ambler, Hon. Secretary, announced a Camera and Cycling Club meeting on Monday, February 29, when a paper will be read by Mr. G. Trotman on "Gloucester."

Mr. Ambler also announced the following donations to the library, *i.e.*, "Quantity Surveying," by Mr. J. Leaning, presented by the publishers, Messrs. E. & F. N. Spon, Ltd.; "Graphic Statics," by Mr. E. Hardy, presented by the publisher, Mr. B. T. Batsford; and "Royal Insurance Building, Liverpool," by Mr. J. Francis Doyle, presented by the author. A vote of thanks having been passed to the donors,

The President gave notice of a Special General Meeting to be held on Friday, March 4, at 7 p.m. to consider the desirability of holding the Ordinary General Meetings on any other day than Friday.

Corner Houses.

Mr. W. Henry White then read the following paper on "Corner Houses":—

Last session I had the pleasure of preparing and submitting to you a short paper upon "Town Houses,"† dealing principally with houses shut in between party walls, and tracing the development of the town house from the XVIth century onwards. Incidentally, I mentioned that I had not dealt with corner or detached houses; this appears to have been sufficient for our committee to suggest the title of the present paper, which I will ask you, therefore, to consider somewhat as a sequel to my former effort, and also to permit me to treat the term "Corner Houses" with considerable latitude and to include "detached" houses in order that I may exhibit views to bear out my remarks, and to provide subjects for what I hope we shall have at the end of the paper—viz., a good discussion.

First, therefore, let us consider the question of "Corner Houses." Is this not a fascinating subject for the exercise of a young architect's flights of fancy? What an opportunity to show to the world at large "all he knows," and yet what pitfalls to be avoided. How many of our street corners have been made unattractive by the inartistic treatment of this problem, and, fortunately, on the other hand, how attractive such corners are when treated in a masterly manner by a capable architect.

To attain this skill is, I am sure, the aim of every earnest student present, and it has occurred to me that it might be interesting to all of us to see in a succession of views how some of our well-known architects have dealt with the problem. I therefore propose to show upon the screen a series of views of buildings which have been erected from the designs of architects, in most cases well known (at least by name) to all of you. I shall also show you views of detached houses and of some corner buildings, to illustrate a few points which I shall mention in passing.

Having described in my previous paper the leading points to be considered in planning a town house of the terrace type, and bearing these points in mind, it will be found that a corner plot frequently increases the difficulty of planning a well-arranged house—so many fresh elements are added to the ordinary problem, and there are possibly a greater number of solutions to be considered before the best is arrived at. But if greater difficulties are introduced the subject is more interesting and provides a wider scope for the architects' powers, and indeed the very awkwardness and difficulties of a site frequently enable the clever designer to produce a quaint and interesting piece of work. The disposition of the principal rooms, owing to questions of "aspect," may now become of vital importance, and, as in the built-in house, the position of the entrance, hall, and staircase will materially help to settle the type of plan to be adopted.

If the site is situated with one side to a principal street and the other to an unimportant street the client will, in most cases, expect the entrance to be in the principal street, and this one point will often hamper the development of the whole plan.

Where the side street is wide and quiet, I think it is desirable in the case of a corner house attached to another house, that the central hall and staircase type be adopted—this permits of the rooms being planned to face the street, but it is impossible to lay down rules for the development of corner sites—each presenting a different problem to solve, and each requiring special consideration.

I strongly recommend our students to collect, examine, and criticise, as many published plans and designs as possible, as by so doing they will learn a great deal, and also when possible make a point of seeing the building illustrated, study its position in regard to its surroundings and the points of the compass, and, if it occurs to you after mature consideration that the problem might have been solved in a better manner, jot down notes for future guidance.

As to the external features of the design of corner houses, here I think a little may be said as to a few things to be borne in mind whatever may be the style or motive we are working in, and the danger which appears to be most imminent is the unnecessary elaboration of the angle which is frequently treated as a thing apart from the general design, and has a "stuck on" effect.

If it be determined to give prominence to the angle treatment care should be taken to still keep it as an integral part of the design. I will allude to this again when we examine the views.

Now as to detached houses:—Except in some of our best thoroughfares and squares, there are few opportunities of erecting detached houses in the heart of London, but where they occur the architect has even more play for his skill, and I shall show you views of various detached houses upon the screen, which I hope will interest you and enable you to study what has been done by others, and help you to equip yourselves for dealing with similar problems when the pleasant opportunity arrives.

The slides which will be shown to you have been made from published illustrations and photographs specially prepared, and I think we may consider many of them as representing the work of some of the best known men of their day. In examining these works the chief point of interest to us appears to me to be to consider how very widely they differ in motive and style.

Very little unity of design exists between them—each architect appears to have been actuated by a different motive as to the design, and although we must admit that individuality is charming, I cannot help wondering whether this struggle for novelty is good for English architecture, good for the training of public taste, however charming each individual piece may appear to us.

When no two men in a profession seem to show any consecutive train of thought (as disclosed by their work) and produce such a variety of designs with no homogeneity of feeling existing between them, how can we expect the public to learn to distinguish between good and bad?

I cannot help feeling that so long as our students are allowed to work upon individual ideas, so long will this heterogeneous work continue, and while such differences of style and aim exist between the masters I fear our students cannot hope to develop a vernacular style.

Municipal architecture, it seems to me, has, during the past few years, in the hands of our ablest men, made greater strides towards a development of our own vernacular style than has house architecture.

This may be, and, I think, is, the result of competition; where each competitor by striving for success, studies more closely the work of the best men of the day, and that work is a distinct carrying on and development of the XVIIIth century work; but there is no such motive with house architecture, where each man is left to his own devices and his client's instructions, and the work illustrated to-night bears out these views.

Of course, I submit my own ideas with all deference, and it may be that those views will not be shared by many of you; but as we have all been taught that the study of old work is absolutely essential, and the more we do study it the more we realise how important a factor in our education it must be, I think we ought to be able to deduce some lessons from it.

Briefly summed up, may we not say that the old work was more consistent as to style? It was a gradual development from one period to another right down to the end of the XVIIIth century. It was always suited to the requirements of the age and the materials used, and possessed a breadth of treatment, from the cottage to the mansion, the village church to the noblest cathedral, far and away beyond that of the average work of to-day.

I am speaking as a student to students, and I ask, Do we show these same qualities to-day in the majority of our work, and, if not, what is the reason? Is it lack of the knowledge possessed by the older architects, or is it that the requirements of the XIXth and XXth centuries are so much more complex that the old rules fail? or is it that, in the multitude of individual teaching, of books, of illustrations, of facilities for travelling, of the innumerable rules and regulations laid down by the many authorities who now have a voice in connexion with our work, and of the lack of a genuine School of Architecture in England, that we are weakened in our efforts and our architecture lacks homogeneity of feeling, and that, in consequence, our streets show the architectural patchwork now presented to our view?

I do not wish to be misunderstood as to my object in bringing forward this variety of work for your inspection, but the idea has been forced upon me by the collection of these views that it is an extraordinary fact, which has to be, or ought to be, studied and analysed; that it is possible in such a comparatively short time for so many different conceptions of the same problem to have been evolved from so many good men.

Here we have, at any rate, the architectural training of the student to foster, and if it be determined by those best qualified to judge, that it is for the good of architecture that there are so many varieties, call them "designs," "styles," or what you will, it is interesting to bring them before our notice for study and comparison; if not, is it not also interesting to study them, to ponder upon the kind of training which has produced them, and to consider how far it is possible to deduce any practical lessons from such a review?

I hope you will not think I am advocating a deadly monotony in design, or that I think it advisable to slavishly copy old work. Careful study of the latter will show how infinitely full of variety it was during any period of English architecture down to the end of the XVIIIth century, and at the same time it was consistent in design and motive.

In my last paper I pointed out how the work of Mr. Norman Shaw had developed, until, at the close of his professional life, he got back to a true development of our own vernacular style, as instanced by the house in Queen's Gate and his splendid work "Chesters." Now, supposing Mr. Norman Shaw had commenced his career with this period of work, it is interesting to speculate upon how he might have developed it; and I submit for our Committee's consideration whether, in our classes of design, if the students were asked to submit designs based upon our own vernacular work instead of what appears to be the case—viz., left to bring in more or less crude ideas, the essence of which seems to be to strike out something novel—such a course might not be productive of good and lead to more thoughtful and consistent work than is now the case. I do not believe this course would cramp the man of genius, and it ought to improve the work of the average student.

Mr. Statham has said in one of his books, "Architecture is now, and must be for the future, a personal art, like sculpture and paint-

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* See our issue for Feb. 13, page 166.
† See our issue for March 28, 1903.

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ing, in which the individual architect gives his impress to his own work, only influenced, more or less, like the sculptor and painter, by the prevalent taste and tendency of the age."

Well, if that be true, our aim, as architects, should be to try and keep the taste of the age, so far as architecture is concerned, within the bounds of reason and good sense, and so that the public may realise we act up to our motto—viz., "Design with beauty and build in truth."

Now, you may be saying to yourselves, What have these remarks to do with "Corner Houses"? My reply is, that they are thoughts which have forced themselves upon me in studying the subject, and we will now proceed to the views, and then, I think, you will see that they have considerable bearing upon the question.

[About eighty views were shown to illustrate the paper.]

A communication on the subject from Professor Beresford Pite was also read. Professor Pite said it was very true that a review of recent house architecture displayed extraordinary variety of conception and ideal. It might appear to a foreigner that each architect here was striving for his own hand in the struggle for originality, and was regardless of any consistency, and probably also without the intellectual trammels of a sound education. Such criticism was not easy to resist. Intimate acquaintance, such as was possessed by every architect or student who felt drawn to Friday morning and its building papers with a zest not felt for other days, however, showed that there was method in the madness, and it was in our inability to think for ourselves, independently and academically, that our liability to pursue so eagerly every fashion and phase of a master or type found such unregulated scope. There was a personal element in published current designs from which we cannot dissociate ourselves, and we follow leaders as inevitably as Court dressmakers. He did not know that it was any good to regret this tendency in the absence of a better one. It was a sign of the age. Time was not taken to study and criticise design. The facility in draughtsmanship which was attainable in a pupil's second or third year was often his full equipment for the practise of design, and he, no wonder, hungrily devoured the notions of modern originators, assimilated and evolved reproductions without at all realising that such designs were not in any sense serious architecture, worthy of himself or of his art. The return to tradition, he thought, was practically impossible—we are our own tradition, and the Gothic Revival was as much a tradition to us as the Renaissance was to Elizabethan and Jacobean designers. The violent progress of architecture during the past century had rendered useless the traditions and design of the old masons and carpenters in whose hands much of the house architecture of the pre-Victorian period was practised. These traditions of workmanship were, he feared, as dead as Queen Anne herself, and we should not be understood by the common artificer of our day if we invoked them as his ideal. Machinery, technical class training, decay of apprenticeship, and many other influences have now to be reckoned with in the building trades, and we can only do our best to pick up the threads in our own hands and weave them with intelligence and sincerity in desire to do everything that is best under all circumstances, whether of brickwork, joinery, sanitation, or decoration. Our artistic traditions are our own, they lie in our clients' lives and desires and in our own intelligence and studies. The fountains of inspiration are ever open to us in the study of all noble building work—Greek, Roman, or Mediæval—and in the work and ways of the individual giants of the Renaissance—even of the Gothic Renaissance—so much nearer to us; and in a hearty appreciation of the fact that it is ours to translate current life into solid materials will lie our road to architectural success.

Mr. Arthur Keen, in proposing a vote of thanks, said that if Mr. White had not kept closely to the subject of his paper he had, at any rate, given material for reflection on matters that lay at the root of all successful design. It seemed hopeless now to expect a return to any uniform style of architecture or even to uniformity of taste and judgment; the day for that had gone by; but there were certain principles that govern all good design, whether in one style or another or in no recognised style at all, such as suitability, regard for material, self-restraint, and so forth, and it appeared to him that in designing corner houses the quality of concentration was too often neglected. In visiting Knowle at Sevenoaks lately he was impressed with the importance and value given to the entrance gateway by the almost monotonous reflection of the long row of gables on either side, all alike and with little three-light windows under them. The ordinary way of building town houses in terraces imposed a certain uniformity and breadth of treatment which was of great possible value in connexion with the design of the corner building, and it was unfortunate that an opportunity for the effective treatment of one or two important features was often killed by too much being attempted, and only a confused and insipid result being reached. Now, in corner houses it seemed to him that the actual height of the building had an important bearing on the method of design. When the building was low and the roof could be seen a great point should be made of the roof and its gable and chimneys and everything else should be subservient to these. Where the building was high and the roof could not be well seen the main effect should be gained by a fine grouping of features on the skyline, and, as a high building was usually a large one, a corner turret might perhaps be introduced. A turret was, however, a dangerous thing to attempt, and it should never be used unless the building was large, so that it could be big enough to preserve its individuality. Turrets generally failed by being so small as to appear like something stuck on to, or growing out of, a building, instead of being an integral part of it, and this appearance was commonly intensified by turrets being over-windowed. The one on Mr. Shaw's St. James-street building was a good example. It had brickwork enough in it to look strong and safe; it asserts itself boldly by starting near the ground, instead of in a half-hearted way out of the roof, and it stands up high enough to get clear of its surroundings and to have a good roof of its own, which, moreover, connects the turret to the rest of the composition by running back and covering quite a considerable portion of the building. An interesting point in connexion with this building was that although it was as fully decorated as any in London, this elaboration of work was not allowed in any way to interfere with the essential points of the design—namely, the gables, the turret, and the ground floor arches. It was only used to give scale and richness without any suggestion of fussiness or confusion. However, the subject of individual features was one that might be discussed at great length; the main point he wanted to emphasise as a small contribution to the subject was that a corner house, coming as the termination of a perhaps uninteresting row of buildings, was the opportunity for showing some well-designed feature to great advantage; the choice lay among many possibilities; it must be made with good judgment, and when it had been made everything else must become subservient to it.

Mr. Maurice B. Adams, at the invitation of the President, in seconding the vote of thanks, said that Mr. White had taken a great deal of trouble in getting together the illustrations he had shown, and the choice he had made was certainly a very catholic one; but he could not help thinking that Mr. White had overestimated the importance of what, on the surface of things, might appear to be too great an individuality displayed in these works, because of the diversity of character which was observable in looking at them in detail. But, on the whole, the building shown did carry on some degree of continuity. For instance, in the case of Mr. Norman Shaw's work at the time of his building at the bottom of St. James's-street, and Mr. Ernest George's work, and the work of others of the same school, there was noticeable a continuity combined with an individuality of treatment which did create for the time being a sort of school; and now, when others were working in what is called the Late Classic style, surely there was a certain degree of continuity in their work also. He did not take the despondent view that some had entertained; later on we should develop something, and probably it would be worthy of being classified as a type of architecture of a very definite kind. There was surely not much difficulty in ascertaining the period when the buildings were erected of which they had seen views. Street's Gothic work was essentially work of its time; it was all carried on in the same sort of definite way. Obviously no one had changed more entirely than Mr. Shaw himself! The last work by Mr. Shaw illustrated during the evening, at the corner of Queen's-gate and which he admired extremely, had the most ingenious and clever plan, but was not its style externally brought about, to some extent, by the material in which the architect was called upon to work, and most certainly it did express his intentions. There were some other rather effective corner buildings which might have been mentioned. The theatre by Mr. Runtz in the Strand was in its way striking as well as satisfactory, and that induced him to say what could not be said too often, *i.e.*, that our work is not large enough, nor simple enough. Contemporary buildings were often lacking in dignity because there was so much detail in them; it might be thought by some that the new "Gaiety" looked coarse in parts of its detail, but at any rate it was bold and imposing, and when one come round Lancaster-place the general composition presented something worthy of the occasion and the effect is extremely interesting. The ingenuity displayed by the architects who built the corner houses they had seen views of, and the way some of them had arranged their staircases, was particularly fascinating, especially those by Mr. Shaw. He had often looked at and studied his plans with admiration, and they always appeared to have a fresh interest each time they were looked at, which was one of the characteristics of all good architecture. They could not but notice the thought which Mr. Shaw had put into his work; unfortunately, the plans of many of our architects suffered because of the absence of such thought. Scale in a building was most essential, but thought was equally so. Much of the work of the Association students appeared to be quite above the average and free from the sort of thing Mr. White reflectingly referred to when he was criticising students' work. Some of the Association student work was admirable, and he doubted whether their predecessors of thirty years ago would have done anything as good. Therefore, there were reasons for encouragement and for persevering in the better education of students. It was as well, too, not to discourage students by making them feel that there was this lack of harmony in contemporary work. Students must go to someone for inspiration, and they could not do better than follow the work of the President and others who had shown them what to do and how to do it. Young men should be encouraged to keep on working and trying, and if they continued to do so on the lines indicated, they would make worthy successors of those whose work had been seen that evening.

Mr. Henry Lovegrove said there was one thing which struck him in London, especially in some of the older houses, *i.e.*, the number of bulged flanks to corner houses, and he knew from observation that there was scarcely one in fifty which was perfectly vertical. He thought that the sanitary arrangements in some of the houses plans of which they had seen were very bad, but the hall was often very cleverly arranged. There was a tradition amongst a good many people that a corner house was not a healthy one, but he did not know why that was. He thought it would have been better for architecture had Mr. Norman Shaw retired a few years earlier than he did, for all architects were not Norman Shaws. Less able men, following some of Mr. Shaw's later work, did not succeed in getting good proportions in their buildings; and, instead, they got eccentricity, and the result was often failure. A development in such a direction did not seem promising for good architecture. In walking about London he felt that Ruskin's teachings were not followed as they should be; there were too many shams, too great an attempt to attract attention, and this was not good for architecture. Still, there were some architects who were evolving, not a new style, but something that was, perhaps, based on the best in old styles adapted to commonsense requirements; elevations were made to fit the plan and to express the purpose of the buildings.

Mr. Edmund Wimperis said he had been greatly interested in the views shown and in the suggestions in the paper. The one impression he had derived from the views had been this, *i.e.*, that the men who could do a good house in a street could do a good corner house, and that the men who could not do a good house in a street could not do a good corner house. There was no doubt that a corner, especially if it was a corner of two streets meeting at an acute angle,

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did tempt the architect into the perpetration of a turret, but it was limited to Mr. Shaw and perhaps half a dozen other masters of the art to make the turret a satisfactory feature. The turret treatment, of course, introduced the vertical principle into the treatment of the front, and he always thought that verticality of treatment was an overmastering principle and invariably tempted one to give more than one could. If they got a corner or angle emphasised by a turret, in nine cases out of ten it produced the feeling with regard to the rest of the front that there must be something to balance it. In the plans they had seen the difficulty of the corner treatment came out very clearly and in the most interesting plans the corner was not emphasised. As to what Mr. White had said about the enormous variety in the work carried out, that variety was, and must be, a very healthy sign for the architecture of the future. There was no doubt that architecture was going through a state of transition—almost a renaissance of architecture in England. The improvement in architecture, more particularly in the architecture of municipal buildings, was an improvement generally; there was no doubt about it. If they took the average work of architects of past days—he did not mean the work of men who had survived the criticism of a century or two, but the average work of the average architect—they would find that it followed on traditional lines. This was not a very heroic virtue. To say "That is the old groove, and I, for one, mean to run in it" was not good for architecture. That practice led, finally, to the work of the early Victorian period and to the great exhibition. The work of the younger men of the present day, particularly the work of the Association students, gave promise of a high average of work, and in the work of young architects now practising, but who had not had time to make a name, there were many indications that architecture was not going to suffer at their hands, but that it would be raised to a very high state of excellence.

Mr. Theo. Moore said he disagreed with Mr. White altogether, though he acknowledged that Mr. White had given them a valuable series of views. Mr. White's conclusions seemed to be that he wanted architects to found a school of architecture. If we had that school we should get here in London something like what one saw in Paris, and he did not think that that would be good for architecture. He thought that London was one of the most beautiful cities in the world, and the beauty of it consisted largely in the variety and originality of its architecture.

The Chairman, in putting the vote of thanks to the meeting, said that the first thing which struck him was that the majority of the views they had seen were from a German publication, and he thought that that was a great reproach to English people. If Germans produced the best illustrations of English architecture, then we ought to be ashamed of ourselves. The illustrations they had seen were certainly excellent, and he did not think we had in England any book which gave such an admirable collection of views of architecture of our own country. He had been a little disappointed that Mr. White had not said more about planning of corner houses. That was a distinct problem, and it demanded a great deal of ingenuity very often. The ordinary corner of a street was a difficult thing to plan, but when the problem was an internal corner of a square or something of that kind it was an extremely difficult matter. As a rule the treatment of an external corner did seem to tempt an architect to design a turret, and that was a feature which had been very much overdone. There was a certain amount of affectation in sitting down to design a corner and providing a turret, and he did not see the necessity for it; nor did he see why the corner should not be treated as a corner without any turret. It was possible, as they had seen, to provide an admirable treatment without any turret. In regard to Mr. White's reflections as to the extreme variety of our current architecture, his (the Chairman's) view was that it was very much to be regretted that there is so much variety and such a want of unity in the aims of our architects. The right point of view seemed to be that, if the general body of architects were working with a certain amount of unity of aim and were striving after the attainment of some definite end in unison, the cause of architecture would be advanced much more than when architects were pulling in opposite or contrary directions. What seemed to him to be at the back of this variety was the lack of any system of architectural education in England. Hitherto there had been no recognised system of educating an architect—no course of training through which a student ought to go in order to acquire the knowledge which he ought to have in order to carry on the work of his profession; and in that way we were very much behind other countries, particularly France, and more and more every year in the case of the United States. In comparing English architecture or the architecture of London with that of Paris, we took a rather narrow-minded and insular view. We spoke of London being the most beautiful city in the world—or in Europe, at all events—and referred to Paris as monotonous and uninteresting. His own view was that that was quite a wrong opinion. Certainly, in coming from Paris to London, one could not help being struck by the extreme squalor of much of the architecture of London and that, he thought, was largely due to the fact that here we had not got the organised system of architectural education which the French had had for many years. He looked forward to the day when we should have such a system in England. He did not think that organised education would fetter anyone; it did not do so in any other country, and architects had the same freedom abroad that we have—but it was on organised and well-developed lines. The effort the Association was making to systematise the education of young architects would have wide-spreading results. The architecture of the future would be just as English as it is now; the only difference would be that it would be backed up by a thorough knowledge of the history of architecture of past ages, which would result in a great forward movement in the future, when we should get what was generally called, for want of a better term, a national style. There would be just the same variety as now and the same individuality, only it would be of a very much higher class and would tend to promote the development of all the kindred arts. In the vote of thanks to Mr. White he would include thanks to Mr. S. Oetzmann, who produced the photographs thrown on the screen that evening.

The vote of thanks having been agreed to,

Mr. White, in reply, said he did not expect them to agree with all he had said, but he thought such a paper might cause a little thinking among architectural students. The subject was one on which there could naturally be a great diversity of opinion. A restraining hand was sometimes necessary when designing.

> "Oh for the wizard hand of patient skill
> To bring forth beauteous order from this pile
> Of rich but wild confusion."

That was the pith of the matter; and, as in the case of Sir Christopher Wren, who went through the land and carried out a series of works—one could not call them monotonous, for they were all varied—so he trusted that we should some day have a school of architecture and in the Association it might be expected to start. The example of their President's work ought to assist them very much. He desired to add his thanks to Mr. Oetzmann for the time he had given to the preparation of the slides they had seen.

The Chairman announced that the next meeting would be held on March 4, when Mr. J. W. Simpson would read a paper on "Schools."

The meeting then terminated.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL general meeting of the Institute will be held on Monday, the 29th inst., in order to elect the Royal Gold Medallist for the current year. The Chairman will move, "That, subject to His Majesty's gracious sanction, the Royal Gold Medal for the promotion of architecture be presented this year to M. Auguste Choisy, Inspector-General in the Service des Ponts et Chaussées, Paris."

The ninth general meeting will be held at the conclusion of the special meeting, for the following purposes:—

(1) To elect candidates for membership under By-laws 7, 8, and 9.

(2) The following resolutions to be moved on behalf of the Council:—"That the necessary alterations to the by-laws be drafted and submitted to a special general meeting to provide that after December 31, 1906, every person desiring to be admitted a Fellow shall be required to have passed the examination or examinations qualifying him as an Associate; but that, in exceptional circumstances, the Council shall have power to dispense with such examination or examinations. Further, that during the intervening period the doors to the Fellowship be opened wider than at present, so that no reputable architect eligible under the Charter for election who desires to join the Institute as a Fellow should be debarred from doing so."

(3) The Council will also submit the following amendments to the "Suggestions for the Conduct of Architectural Competitions":—Clause 2 (*a*) to read as follows—

"To draw up the particulars and conditions (as far as possible in accordance with the principles herein set forth) as instructions to competitors, and also to advise upon the question of cost, and the amount and apportionment of the premium or premiums.

Note.—In drawing up the Instructions to Competitors it is desirable to divide them into two distinct classes:

(i.) *Conditions—i.e.*, those which must be strictly adhered to.

(ii.) *Suggestions—i.e.*, those which are merely optional or of a suggestive character.

Clause 7: Delete entirely.

Renumber clauses 8, 9, 10, 11 as 7, 8, 9, 10 respectively.

Clause 12: Delete all first paragraph and renumber the second paragraph beginning "It is essential . . ." as clause 11.

Add the following clause as the new clause 12:

The author of the design placed first by the assessor or assessors should be employed to carry out the work, and he should be paid in accordance with the Schedule of Professional Practice as to the Charges of Architects sanctioned and published by the Royal Institute. If no instructions are given to him to proceed within twelve months from the date of selection, or if the proposed works are abandoned by the promoters, then the selected architect should receive payment for his services in connection with the preparation of the competition drawings of a sum equal to 1½ per cent. on the amount of the estimated expenditure.

Mr. H. Hardwicke Langston has given notice that at this meeting he will ask the following question:—

"Is it in the power of the Council to say whether it is the intention of the Registration Committee, in view of the great interest attached to the movement for the statutory qualification of architects, to take a poll of the members of the Institute upon the general principle involved?"

CARPENTERS' HALL LECTURES:

OUR ATMOSPHERE AND ITS RELATION TO HEALTH.

THE first of the usual February-March series of free lectures on matters connected with building, arranged by the Carpenters' Company, was given on Thursday evening last week at Carpenters' Hall, London-wall, Mr. Percy Preston, Master of the Company, presiding.

The lecturer was Professor Vivian Lewes, Royal Naval College, who delivered an interesting lecture, entitled, "Our Atmosphere and its Relation to Health," which was fully illustrated by a number of experiments. He first dealt with the subject historically, mentioning the first known experiment on the atmosphere, *i.e.*, Aristotle's attempt to weigh the air in the year 350 B.C., and the subsequent investigations and experiments of others. It was not until the latter half of the XVIIIth century that the atmosphere began to have what might be called a chemical history, and it was then discovered that the air was not an element, but that it contained elements simpler than itself. The lecturer referred to the laborious and valuable researches of Lavaisier, Cavendish, Priestley, and others, and stated that Cavendish made over 400 analyses of air in London in one year, going "even as far as Maida Vale," as he said, for his samples. The atmosphere contained 20 per cent. of oxygen and 79 per cent. of nitrogen, and it was the oxygen in water that made the possibilities of a good drinking-water in towns, for it burnt off the organic impurities which got into the water somehow.

The lecturer then made a number of interesting experiments to show with what vigour anything that will burn in air will burn in oxygen gas, and also that many things which we do not regard as combustible will burn in it. Phosphorus, when brought into contact with oxygen, gave one of the strongest lights, and zinc

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and steel would burn like tinder in this wonderful gas. The steel spring he used for the experiment was quickly burnt up, and it left the sides of the glass jar in which the oxygen was coated with iron rust, which was formed with great rapidity. Nitrogen would not combine directly with anything, but by indirect means it would form more compounds than any element known, and it would combine indirectly into five oxides. Oxygen and nitrogen were the two main constituents of the atmosphere, but there were other constituents which used to be called impurities, and there were at least three things which were as much part of the atmosphere as oxygen and nitrogen. In the first place, there was carbon dioxide, which was always present in the atmosphere, and which nature used in the proportion of 4 parts in 10,000. In that proportion carbon dioxide was not an impurity, but an essential constituent of the atmosphere, without which it would be impossible for vegetation to live, and it was an impurity only when it exceeded that quantity. In an over-heated room we could get carbon dioxide above its proper proportion, and if it increased up to 10 parts in 10,000 it became a real impurity and affected health. Water vapour was another constituent which always existed in the air, and according to the temperature. When the air was warm there was a large amount of water vapour in it. In that hall there might be 12 grains of water suspended in every cubic foot of air, but that was not an impurity; life without that would be impossible, for if the air were absolutely dry in three or four weeks we should be converted practically into mummies. Another constituent of the air, a very minor one, was ammonia gas, but it was needed in nature for plant life.

The lecturer then described how carbon dioxide was produced, and how nature had provided for its consumption by vegetation, and how the proper proportion of the two constituents oxygen and nitrogen was secured. Faraday estimated that the oxygen taken from the atmosphere daily was 3½ million tons. The balance was restored by trees and plants, which were continually providing oxygen. So long as we got fresh air there was, other things being equal, no chance of getting bad health. But we put up a barrier to nature, and we insisted on having our air comfortably warmed. If we wished to escape the penalties, we must do our best, by providing efficient ventilation, to help nature carry on her work. By breathing hot, tainted, air we should get in an ailing condition; by getting plenty of fresh air we should find that half the petty ills of life would disappear.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE annual general meeting of this Institution was held on the 23rd inst. After the monthly committee meeting business, Mr. F. S. Oldham vacated the chair in favour of Mr. F. G. Minter, President for the new year, and the thirty-seventh annual meeting was held.

The Secretary (Mr. J. Austin) presented the report, which expressed regret that, as the result of continuous depression in trade, donations and subscriptions had fallen off. The year's annual subscriptions were 233*l.* 12s., donations, 271*l.* 17s. 6d.; dividends, 168*l.* This, with a balance of 26*l.* 2s. 11d. from the diminution account, brought the total income to 699*l.* 12s. 5d. Of this amount 606*l.* had been paid in pensions, twenty-four widows received 24*l.* each, and an aged clerk 30*l.* per annum. Altogether the year's expenditure had exceeded the income by 13*l.* 18s. 11d. The report also expressed regret at the death, during his year of office, of Mr. Deputy Greenwood, the late President.

Mr. E. Brooks (hon. treasurer) read the financial statement for the year.

The Chairman, in moving the adoption of the report and balance-sheet, said they must not be surprised at finding the Institution was not in as flourishing a condition as could be desired, as there was no question that just now trade in the country was very bad. However, they must all pull together; the cause for which they were working was a thoroughly good one, and in every way deserving support, and with hard, earnest work he trusted they might retrieve their position and that the Builders' Clerks' Benevolent Institution would do as much in the good direction they would travel as ever they had done—aye, and better if possible.

INCORPORATED CLERKS OF WORKS ASSOCIATION.

THE twenty-first annual dinner of this Association was held on Monday in the King's Hall, Holborn Restaurant, Mr. E. T. Hall presiding. There were also present Messrs. F. T. Baggallay, T. E. Collcutt, J. M. Deacon, J. Hutton Freeman, H. T. Hare, J. Brady, J. T. Rees, and a large gathering of members and friends of the Association.

The loyal toasts having been proposed by the Chairman and honoured,

Mr. J. Aitchison suitably proposed "The Architects and Surveyors," coupled with the names of Mr. H. T. Hare and Mr. J. M. Deacon.

Mr. Hare, in replying for the architects, said he had heard it stated that there were three essentials to the successful carrying out of a building contract, and they had been called the A.B.C. of building, *i.e.*, architect, builder, and client; but he thought there was a serious omission, for the clerk of works should have been added as a fourth essential. He was quite sure that any building contract of any importance would be carried out in a very inefficient manner without the assistance of a competent clerk of works, and architects would be in a most unfortunate position if they did not have the assistance of clerks of works. When buildings were carried out at a distance from the architect's office, as they often were, and it was only possible for the architect to make an occasional visit to a building, he was almost entirely in the hands of the clerk of works, for it was in the power of the clerk of works to make or mar a building. The clerk of works was a sort of policeman over the builder; he had to interview and converse with the client; generally speaking, he occupied a most important and responsible position, and if he were not competent to carry out his duties as they should be carried out, the building suffered. He was happy to say that he had never had occasion to complain of the incompetence of a clerk of works, and he believed that they were a thoroughly trained and high-minded body of men. In so far as the Association assisted in the training of its members, they would receive the fullest sympathy from architects.

Mr. J. M. Deacon, in responding for the surveyors, referred to the work of the Surveyors' Institution, and said that the Institution examined young surveyors and thus helped them to become capable surveyors. There was some little dissatisfaction towards the Institution felt by some surveyors. A small party of surveyors recently met and agreed that the Institution did not properly represent them, and they had signed a memorial asking the Institution to alter the rules so that automatically in the future two quantity surveyor members should always be on the Council. Besides that, the Institution had been asked to allow the quantity surveyors in London to elect five members amongst themselves to work with the two members of Council, and to deal with all questions relating to quantity surveyors. The Institution had also been asked to show in their list of members in which branch of the profession the members were engaged, *i.e.*, as quantity surveyors, land surveyors, or auctioneers.

Mr. J. Roberts then proposed "The Worshipful Company of Carpenters," remarking on the good work the Company had done for the building industry by their lectures, examinations, and workshops.

Mr. J. Hutton Freeman, Clerk of the Company, replied. The Company was only too glad to help clerks of works in the way they did, and to carry on the work that had been referred to. The Company must have a specially cordial feeling for the clerks of works, because in the old days the masters and wardens of the Company exercised somewhat the same powers that clerks of works do now—they viewed buildings, and if anything were wrong in the construction they had power to condemn it and have it pulled down. The Company were now making an effort to help on the cause of forestry in the country and he hoped that they would be supported. Many people considered that timber was even safer than steel in cases of fire, but there was no use in making wood non-inflammable if the supply of wood was going to fail us, and, as they knew, there was a great shortage in the supply.

The Chairman then proposed the toast of the evening, "The Incorporated Clerks of Works Association of Great Britain," coupled with the name of Mr. J. T. Rees, the President. The Association was one primarily for social intercourse between clerks of works, but in addition to that they desired to raise the status of the clerk of works, and they must all be aware that that status had been raised. This was the first year of the incorporation of the Association, and he was told that a further advance was contemplated, *i.e.*, in the direction of organising a benefit fund, which would be a most useful feature in connection with the Association. It was a great advantage that men who had honestly done their work, and yet fell out in the race of life, should be helped in a time of temporary need. As an architect, and speaking for architects, he could say that they wished all success to the Association.

Mr. Rees, in response, said that they had made more members this year than they had done for many years past, and he believed that the Association would go on prospering. The feeling which existed amongst the members augured well for the success of the Association. A clerk of works who joined them would never regret doing so, and he appealed to all those who were not members to join. This was an opportune moment for doing so; in the very near future they might inaugurate a system of admission by examination, and that would be rather distasteful to men rather advanced in life. He desired to take the opportunity of thanking Mr. J. Pain, their Hon. Secretary, for the great amount of work he had done for the Association.

The concluding toasts were "The Press," proposed by Mr. J. Brady, Editor of the Clerk of Works' *Journal*; "The Visitors," proposed by Mr. W. Pitts, Vice-President of the Association, and "The Chairman," which was proposed by Mr. R. H. Kellond.

ASSOCIATION OF MANAGERS OF SEWAGE DISPOSAL WORKS.

AT a meeting of the Yorkshire District Branch of the Association of Managers of Sewage Disposal Works, held on Saturday last at the Westminster Hotel, Leeds, Mr. James Ashton read a paper on "The Disposal and Utilisation of Sewage Sludge." Mr. W. D. Scott-Moncrieff presided, and remarked that Leeds and the neighbouring towns, more especially Bradford, were situated in circumstances of the greatest difficulty as regards the disposal of their sewage. These towns were far from the sea, and now the sea could not be utilised as a means of the disposal of the sludge, some other method must be adopted.

Mr. Ashton remarked that during recent years they had been told that they need have no sludge at sewage works, but his opinion was that there would always be sludge, no matter what system was adopted or however well managed any particular system might be. The more sewage obtained by increased population, the more exacting were the rivers authorities, and consequently a greater amount of sludge accumulated at the works. He dealt fully with the disposal and various methods of drying and pressing sludge, and remarked that sludge, if treated properly, could be made to very great use as a manure. The sludge of every town varied in its composition, and in towns where wool-scouring and other greasy processes were carried on, there was great difficulty in pressing the sludge. There was no place where more trouble in this respect was met with than in Bradford. Mr. Ashton, in closing his paper, said that what he was desirous of pointing out was that sludge was useful and valuable, but that in the present condition of treatment it was a nuisance. The advantages to be secured by adopting a method of drying sewage sludge subsequent to pressing would be that the present bulk would be reduced to less than one-half; it would be perfectly dry to handle, it would be in a thoroughly sanitary condition, and would be worth anything from five to twenty shillings per ton as a manure.

THE LONDON WATER COMPANIES AND ARBITRATION AWARDS.—The special court of arbitration announced on Monday its awards on the claims of the remaining water companies which are to be absorbed by the Water Board. The undertakings have been valued as subject to the Chamberlain's sinking fund. If the House of Lords holds that the companies are free from the sinking fund, the awards will be increased:—

	Claim.	Award.
Lambeth	£5,466,923	£4,301,000
Southwark and Vauxhall	£5,513,946	£3,605,000
Chelsea	£4,750,000	£3,505,000
Kent	£2,981,520	£2,712,000

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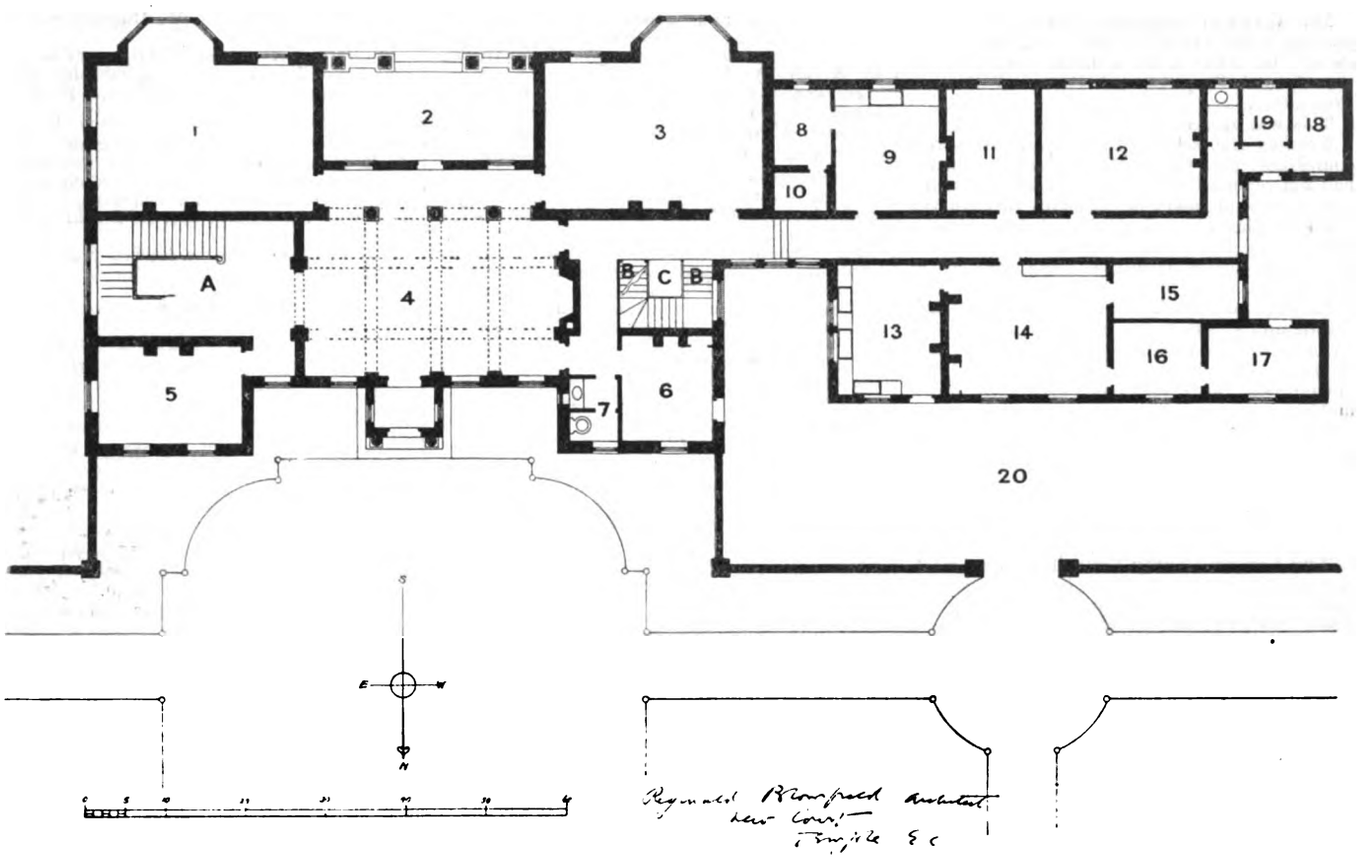

References to Plan.

GROUND PLAN.

1. Drawing Room.
2. Loggia.
3. Dining Room.
4. Hall.
5. Smoking Room.
6. Gun Room.
7. Lavatory and Water-closet.
8. Butler's Bedroom.
9. Butler's Pantry.
10. Strong Room.
11. Housekeeper.
12. Servants' Hall.
13. Scullery.
14. Kitchen.
15 and 16. Larders.
17. Dairy.
18. Lamps.
19. Boots.
20. Back Yard.

A. Main Stairs. B B. Back Stairs and Stairs to Cellar. C. Lift from Cellars to Top Floor.

House at Medmenham. Plan. (See "Builder" for February 20.)

PLAN OF HOUSE AT MEDMENHAM.

This is the plan of the house by Mr. Reginald Blomfield, the perspective view of which appeared in our last issue. The plan was sent to us too late to appear along with the view.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, Lord Monkswell, chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Bethnal-green Borough Council, 8,000*l.* for the erection of stables at depôt, and for paving works; Poplar Borough Council, 5,895*l.* for sewer reconstruction works; and St. Pancras Guardians, 2,400*l.* for poor law purposes. Sanction was also given to Westminster City Council to the borrowing of 1,136*l.* as contribution to cost of street improvement.

Tenders.—Several tenders for works for the Council were agreed to. They will be found on our Tender pages.

Cost of the Holborn to Strand Improvement.—In reply to a question, Lord Welby said that the gross expenditure on the Holborn to Strand Improvement up to December 31 last was 4,010,452*l.* As recoupment they had received 185,866*l.*, which left a net expenditure of 3,825,086*l.*

The Paris Fire.—In answer to Alderman Dew, Mr. Hemphill, the chairman of the Building Act Committee, said the Council was enabled to deal with factories established for the manufacture of dangerous articles, but not the storage of such articles as celluloid. Celluloid was concerned in the recent fatal fire in Paris, and also in the fatal fire in Queen Victoria-street. The only way was to deal with celluloid as they did with the storage of petroleum, but that would require either new legislation or action on the part of the Home Office.

Conditions as to Building on the Council's Land.—The report of the Corporate Property Committee contained the following paragraph:—

"The Council on December 1, 1903, amended condition No. 13 of the building conditions so as to include therein the following provision:—

"If, and so often as the same shall happen, any dispute shall arise after the plans and specifications have been approved between the Council and the lessee as to any matter connected with the erection of the said building or buildings, or the foundations or drainage thereof, or the preparation, laying out, fencing, or otherwise dealing with the said land, which matter is not provided for by 'the approved plans and specifications,' or any additions to, alterations in, or omissions from the same authorised as aforesaid, or by these conditions or conditions of approval every such dispute shall, if the parties do not agree, be decided by an arbitrator, appointed by the president of the Royal Institute of British Architects, whose decision shall be final.

"We then stated in our report that we did not ask the Council to fix the exact terms of the clause, as the drafting of the building conditions had been left in our hands.

"The clause as now drawn would only deal with disputes which might arise after the plans, etc., had been approved, and as it is necessary to make provision for the determination of disputes before this event, we propose that the exact wording shall be as follows:—

"If, and so often as the same shall happen, any dispute shall arise between the Council and the lessee as to any matter connected with the erection of the said building or buildings, or the foundations or drainage thereof, or the preparation, laying out, fencing or otherwise dealing with the said land, which matter is not provided for by 'the approved plans and specifications,' or any additions to, alterations in, or omissions from the same, authorised as aforesaid, or by these conditions, or conditions of approval, or as to whether any such matter is or is not so provided for, or as to the manner in which the same is provided for, every such dispute shall, if it arise before the plans and specifications have been approved, be decided by the architect, and if it arise thereafter be decided by an arbitrator to be appointed failing agreement by the president of the Royal Institute of British Architects, whose respective decisions shall be final."

Mr. White asked in what respect the proposal of the Committee differed from previous undesirable proposals?

Mr. Mullins, chairman of the Committee, said the proposal was made with the idea of giving effect to the previous decisions of the Council.

Mr. White said he should move that the paragraph be not received. According to the Committee's proposal, the Architect to the Council would still have power to impose his views, and there ought to be some appeal from the arbitrary decisions of any one man. It was desirable that the Council's land should be let as quickly as possible, and an appeal to an independent arbitrator after the plans had been agreed to was not of much advantage.

Mr. Lewis seconded. In his opinion the citizen of London was quite at the mercy of the Architect, who the Committee seemed to think was a transcendental genius, superior to all the other architects of London.

Mr. Howell J. Williams said that if the Committee's proposal was agreed to it would prevent people coming forward to take up the Council's surplus land, a large amount of which was to let.

Several other councillors having spoken to the same effect, the amendment was, on a show of hands, lost, and the report was adopted.

Proposed Shakespearian Memorial.—The Historical Records Committee recommended, in reference to the offer by Mr. R. Badger, of Eastbourne, that the letter of Mr. Badger with reference to the proposed erection of a memorial to Shakespeare in London be received with pleasure, and that his generous offer to give to the Council the sum of 500*l.* to defray the expenses of collecting funds for the memorial, and of 2,000*l.* upon trust as a contribution towards the fund, be accepted; that it be referred to the Historical Records and Buildings Committee to consider and report as to the nomination of trustees who would undertake to form a public committee, independent of the Council for the purpose of collecting subscriptions under the terms of Mr. Badger's gift of 500*l.*, so that the Council itself shall not be committed to collecting the required subscriptions; and that the Council is prepared to consider proposals for a site for the purpose of erecting thereon a memorial to Shakespeare, subject to it being satisfied that public subscriptions to a sufficient amount are forthcoming, and to its sanction being obtained to the form of the proposed memorial.

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Mr. Cornwall suggested that, instead of passing a resolution in that form, the matter should be referred to a joint committee of the General Purposes and Historical Records Committee.

This was agreed to.

Traction Engines in Streets.—Mr. Beachcroft complained that the Public Control Committee had not reported on the question of controlling the passage of heavy locomotives through the streets. The Council had lost the opportunity of going to Parliament this year, and were continually licensing these engines of destruction.

Mr. Goddard Clarke said the Committee had drawn up by-laws on the matter, and had sent them to the Local Government Board for their approval. Until they heard from the Local Government Board they could do nothing in the matter.

Having transacted other business, the Council adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Clapham.—The retention of a greenhouse at Brooklands, Thurleigh-road, Clapham, abutting upon Ramsden-road (Mr. W. C. Poole for Mr. W. G. Allen).—Consent.

Dulwich.—Buildings on the site of Nos. 307, 309, and 311, Camberwell New-road, Camberwell (Mr. A. E. Mullins for Mrs. S. Melhuish).—Consent.

Islington, North.—A one-story motor-car building at No. 56, Crouch-hill, Islington, to abut upon Blythwood-road (Mr. F. L. Dove).—Consent.

Kensington, South.—Extension of a one-story building under the existing conservatory at Ellesmere House, Templeton-place, Earl's Court (Messrs. Leslie and Co., Ltd., for Mr. D. Vigo).—Consent.

Kensington, South.—Residential flats on the site of Nos. 34 to 44 (even numbers only), inclusive, Abingdon-villas, to abut also upon Allen-street, Kensington (Mr. S. Newcombe for Mr. W. J. Blow).—Consent.

Marylebone, West.—Residential flats, with bay windows, upon the site of Nos. 79 to 109 (odd numbers only), inclusive, Park-road, Regent's Park (Messrs. Runtz and Ford for Mr. M. Gluckstein).—Consent.

Paddington.—Retention of a balcony and three bay windows in front of No. 8, Lancaster-gate, Paddington (Mr. C. Sale for Mr. E. H. Hodgkinson).—Consent.

St. George, Hanover-square.—Retention of a projecting iron and glass pent roof over the area at the rear of Nos. 243, 245, 247, and 249, Regent-street, abutting upon Swallow-place (Messrs. Z. King and Son for Jays, Ltd.).—Consent.

Norwood.—Buildings upon a site abutting upon the north-east side of Milkwood-road and south-west side of Herne Hill-road (Mr. C. M. Quilter for Mr. S. Adams).—Refused.

St. Pancras, South.—An iron and glass pent in front of No. 131, Gower-street, St. Pancras (Mr. P. Young).—Refused.

Wandsworth.—Buildings upon the site of Nos. 17, 19, 21, 23, and 25, Balham-hill, Wandsworth (Messrs. Searle and Hayes for Messrs. J. Garrett and Sons).—Refused.

Wandsworth.†—The erection of a showcase upon part of the forecourt of No. 81, Clapham Park-road, Wandsworth (Mr. G. Garner for Mr. W. Whiteman).—Refused.

Width of Way.

Brixton.—The completion of a stable building on the north side of Melbourne-square, Brixton, with the forecourt fence at less than the prescribed distance from the centre of the roadway of the street (Mr. H. G. Assiter).—Consent.

Limehouse.—A one-story building adjoining No. 47, Repton-street, Limehouse, with external walls at less than the prescribed distance from the centre of the roadway of the street (Messrs. W. Stuttle and Son for Mr. G. Lloyd).—Consent.

Rotherhithe.—A one-story cart shed and stable at No. 8, Bermondsey-wall, Rotherhithe, with the forecourt fence at less than the prescribed distance from the centre of the roadway of the street (Mr. E. Crosse for Messrs. Puttock and Peacock).—Consent.

Line of Frontage and Space at Rear.

Hackney, North.—Deviation from the plans approved for the erection of a house on a site abutting upon the south side of Cazenove-road and west side of Geldeston-road, Hackney, with bay windows and porch and open space about such house so far as relates to the erection of a greenhouse at the premises (Mr. G. R. Woodruff).—Consent.

Hackney.—A summer-house and tool cupboard in front of No. 130, Cazenove-road, Hackney (Mr. G. R. Woodruff).—Refused.

Width of Way and Lines of Frontage.

Lewisham.—An addition at the rear of No. 21, West-hill, Sydenham, to abut upon Amberley-road (Messrs. J. Dennett and Co. for Mr. R. B. Beeton).—Consent.

St. George, Hanover-square.—That the application of Messrs. Woodrow and Helsdon for an extension of the period within which the erection of a one-story lavatory addition to the Grosvenor Hall, Buckingham Palace-road, St. George, Hanover-square, with external walls at less than the prescribed distance from the centre of the roadway of Flask-lane was required to be commenced, be granted.—Agreed.

Width of Way, Lines of Frontage, and Construction.

Hackney, Central.—A wood and iron building of a temporary character at the Duke of Wellington public-house, Morning-lane, Hackney, to abut upon Chatham-place (Messrs. Snewin Brothers and Co. for Messrs. Holt and Co.).—Consent.

Brixton.—A wood, iron, and glass building at the rear of No. 28, Coldharbour-lane, Brixton, to abut upon Crawford-street (Mr. G. Turner).—Refused.

Width of Way, Line of Frontage, and Space at Rear.

Woolwich.—That the application of Mr. H. P. Monckton, for an extension of the period within which the rebuilding of Nos. 2, 3, and 4, Frances-street, Hill-street, Woolwich, was required to be completed, be granted.—Agreed.

Formation of Streets.

Greenwich.—That an order be issued to Mr. A. Mitchell Torrance, sanctioning the formation or laying out of new streets for carriage traffic upon the Kidbrooke Lodge estate to lead from St. Germain's-place to Kidbrooke-grove, Greenwich (for Sir John McDougall).—Agreed.

Woolwich.—A deviation from the plans sanctioned for the formation of new streets upon the Eltham Park estate, High-street, Eltham, so far as relates to an alteration in the gradient of Dairsie-road (Mr. R. Stewart for Mr. A. Cameron Corbett, M.P.).—Consent.

Wandsworth.—That an order be issued to Messrs. F. W. and E. Lucas and H. Erichsen, refusing to sanction the formation or laying out of new streets for carriage traffic out of the western side of Tooting Bec-road, Upper Tooting.—Refused.

Space at Rear and Means of Escape at Top of High Buildings.

Chelsea.—A deviation from the plans approved for the erection of a building to abut on Sloane-gardens, Sloane-square, and Lower Sloane-street, Chelsea, so far as relates to the erection of such buildings as shown upon the plan, dated January 30, 1904 (Mr. E. W. Mountford and Mr. A. F. Faulkner for Mr. W. Willett). That Mr. E. W. Mountford and Mr. A. F. Faulkner be informed that the Council has considered the plans showing the means of escape in case of fire proposed to be provided on the fifth and sixth stories of a building to abut on Sloane-gardens, Sloane-square and Lower Sloane-street, Chelsea, and that the Council will issue a certificate under the section.—Agreed.

Space at Rear.

Chelsea.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of buildings on a site abutting upon the north-west side of Basil-street and east side of New-street, Chelsea, with open spaces about such buildings (Mr. R. Bennett).—Consent.

Rotherhithe.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of an addition at the rear of No. 6, St. Helena-road, Rotherhithe, with an irregular open space at the rear of the premises (Mr. H. A. Vohmann).—Consent.

Wandsworth.—Two buildings on the north-west side of High-street, Tooting, westward of Selkirk-road (Mr. D. Watney for Messrs. Attlee).—Consent.

Paddington, South.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of an addition at the rear of No. 114, Westbourne-grove, Paddington (Mr. G. A. Sexton for Mr. A. Woollard).—Refused.

Strand.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of an addition at the rear of No. 17, Charles-street, Haymarket (Messrs. Treadwell and Martin for Messrs. W. Dunstan and W. J. Styles).—Refused.

Westminster.—An additional story to Nos. 1 and 2, William-street, Knightsbridge (Mr. S. Skrimshire for Mr. H. Gilbert).—Refused.

Dwelling-houses on Low-lying Land.

Deptford.—That a licence be granted to Mr. A. E. Gould for the erection of five dwelling-houses on low-lying land, situated on the south side of Hornshay-street, Deptford, in accordance with the plan of Mr. A. Blackford on his behalf.—Agreed.

The recommendations marked † are contrary to the views of the local authority.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION:

THE LEGAL POSITION OF AN ARCHITECT.

THE Discussion Section of the Association held the eighth meeting of the session on the 17th inst., when Mr. Walter C. Williams, solicitor, read a paper on "The Legal Position of an Architect."

Mr. Williams, in introducing the subject, confessed to finding some little difficulty as to a fitting definition of an architect, for auctioneers' clerks, and unsuccessful builders "prepared plans"; he, therefore, asked for latitude in the use he made of the word at a time when the price of a brass plate and the effrontery to stick it up were all the apparent requisites to a man calling himself an architect. Duties, with the attendant liabilities as to their breach, were then dealt with, and it was shown how the displeasure of the law might be incurred if due skill were not used in the preparation of plans or due vigilance exercised if their carrying out had to be superintended. In France an architect had been held criminally responsible for the death of a man killed by the fall of a building owing to defective design, and although we had not got to that it was conceivable that even in England circumstances might arise under which an architect might be found guilty of manslaughter. The liabilities of the architect in his capacity as agent of the employer under contract were next taken—his position in relation to the builder, his authority for taking out quantities or having them taken out, and as to their accuracy; the considerations governing extras, omissions, and variations; certificates, especially the issue of the final certificate, where his capacity is that of an arbitrator; and cases were cited and their salient points brought out:—Moon *v.* Witney Union Guardians, Restall *v.* Nye, Waghorn *v.* Wimbledon Local Board, Randall *v.* Trimen, Ford *v.* Bemrose, Thorn *v.* Lord Mayor of London, Rex *v.* Peto, Chambers *v.* Goldthorp, Kemp *v.* Rose, etc.

Turning to rights, although the architect, like any other man, was entitled to be paid a reasonable remuneration for work done, yet it could not be said that he had any special or definite rights *qua* architect. He had not the ascertained position of the solicitor, whose fees are fixed by statute, nor even of the medical practitioner; he could only recover on a *quantum meruit*, the 5 per cent. being but a delusion, for although that rate may be, and is, accepted as a reasonable basis of remuneration, it is open to the other side, to show that it is not so, and the architect must accept the amount awarded by the court. This, of course, would only apply in the absence of an express agreement for payment, whether verbal or in writing. But if the contract be to do something that is not to be completed within twelve months of date of contract, then it must be in writing or there is no recovery; and in this connexion the efficacy of the sixpenny stamp was strongly emphasised. If dealing with a corporation, *i.e.*, a limited company, municipal council, or board of guardians, the absolute necessity for the contract being under the common seal of the corporation was referred to. A letter from secretary or manager, or even a resolution entered on the minutes, would not suffice. However, comforting exceptions to this were vouchsafed. The counsel of perfection—in law the only counsel—was given as to taking instructions from client, doing sketch plans, and so on (cases referred to: Lawford *v.* Billericay, Billericay *Board of Guardians*, Moffat *v.* Dickson), and as to obtaining fees on account, if not beforehand.

With reference to the ownership of plans, the case of Ebdy *v.* Gowan decided that where an architect was instructed merely to prepare plans or designs, on payment of fees they belonged to the employer, but where plans were prepared for works to be carried out under the

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architect's superintendence the law was not so clear.

In the discussion which followed—opened by Mr. F. G. W. Buss, and sustained by Messrs. W. Trant Brown, Louis Ambler, Theodore Fyfe, A. H. Belcher, Max Clarke, and the Chairman, Mr. J. H. Pearson—the terror of the law, as so clearly expounded by Mr. Williams *as* law, was fortunately somewhat dissipated and equanimity of mind in part restored. An instance was given wherein a local board had actually been overcome by nothing stronger than moral pressure—"bluff" in fact—and the fees paid up in full, though the commission had not been under the common seal of the august body concerned. But it was not safe to presume, and there was a concensus of opinion that prevention was better than cure. For estimates ought not to be exceeded, neither should there be any ambiguity as to fees and the manner of their payment. If ordinary business methods were but adopted, and the R.I.B.A. scale of charges duly placed before the prospective client, all would go well. Too great a nicety in such delicate matters at the initial stage was not to be indulged in. In practice an architect could usually have extras carried out up to a limit without complications arising, and, occasionally with larger amounts, if the client were kept informed on the various matters as they arose. The approving or otherwise of building materials ought to be reserved wholly to the architect, for he ought to know his materials and see that they were good. In this connexion the form of contract as drawn up by the R.I.B.A. was thought to be open to some improvement. Some sympathy was manifested towards the unfortunate builder, who, to the call of an all too exacting employer, perchance was obliged to execute certain works according to contract, even though great unforeseen outlay, with attendant loss, should have to be incurred in their literal performance. Nor was the architect always able, in the proper discharge of his duties as defined by the contract, to indulge his feelings of justice as towards the builder.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS.

III.—Church of Holy Trinity and Royal College of Science, South Kensington.

South Kensington was once again selected as the district for the third visit by the Architectural Association on Saturday, February 20, when, in addition to the large Government works in progress which have been inspected in previous years, a special interest was provided by the inclusion of the Church of the Holy Trinity in the programme for the afternoon's work.

Mr. G. F. Bodley, R.A., the architect of the church, kindly met a large party of members, including the President, Mr. H. T. Hare, and gave much useful and valuable information, which added materially to the success of the visit. The church when completed will seat about 1,500 people, disposed in the nave, the east aisle, and the double west aisles. Services were commenced in October last, when the work was finished with the exception of the double aisles, and consequently a temporary brick wall had to be erected on the west side of the nave. Owing to the limits of the site, Mr. Bodley found it necessary to depart from the usual orientation and to substitute a north and south axis. The entrance from the new road on the south is placed on the extreme boundary line in order to gain the maximum internal length; no porch or lobby is provided.

The internal length is 112 ft.; the approximate width of the nave is 28 ft., the height of which to the ridge is 60 ft. To add to the appearance of length a rise of about 12 in. in the floor from south to north has been ingeniously contrived, and, to a great extent, produces the desired effect. The sources of all daylight are practically from the two large north and south traceried windows, the former of which has a very long uninterrupted centre light. Two smaller side windows in the chancel light up the altar and dossal. For evening use and for dull days electric lighting is employed, but it is noteworthy that, as far as possible, it has been the architect's endeavour to conceal both the natural and artificial lighting from the eyes of the worshippers, with marked success.

It is readily seen that large internal effects have been striven for; to assist this effect no chancel arch or step is provided, no change in width is introduced in the sanctuary, and nothing in the roof marks the position of the choir. The nave arcades consist of slender cluster shafts carrying arches, which recall all that is best of XIVth century English work. The roof is in the form of a plain, straight-boarded vault relieved by heavy wooden ribs springing from small shafts rising from the main piers. These ribs were originally intended to be built in stone, but owing to the lack of abutment caused by the absence of the flying buttresses of the double aisles, timber had to be employed. Both the nave roof and that spanning the small east aisle have been finished throughout with charming painted colour decoration.

Money not being too plentiful, economy had to be borne in mind. The external and internal walls are faced with Box Ground Bath stone; the roofs are covered with tiles; the chancel floor and main passages are paved with black and white Belgian marbles laid in large scaled designs, finished with a high polish, and the flooring under the chairs which provide for the seating accommodation is of wood blocks laid square.

Few internal permanent fittings are as yet in position. The organ (without its case) is approached by a spiral iron staircase enclosed in an oak panelled casing. Some fine designs for stained glass, organ loft, and chancel screen were hanging on the walls, which conveyed an idea of the ultimate effects which, together with the large amount of colour decoration anticipated and the completion of the double aisles, will make this church not the least striking and beautiful of the many fabrics for which Mr. Bodley is the author. Messrs. Stevens and Bastow, of Bristol, have built the church in an admirable manner. The hot air system of heating has been carried out by Messrs. Hayden. No effort has, however, been made properly to ventilate the interior, the small provision made being quite mediæval in its nature and extent.

The party then visited the Royal College of Science new buildings in Imperial Institute-road. In the absence of the architect, Mr. Aston Webb, L.R.A., the visitors were received by Mr. Peacock, clerk of works, who, in addition to conducting them over this enormous undertaking, had very thoughtfully set up plans and details in the various parts of the buildings to which they had reference.

A previous visit was made last year, and we gave a detailed account of the ventilation and other matters in our issue of February 22, 1903. In the interval which has elapsed considerable progress has been made by the contractors, Messrs. Leslie and Co. From a height of some 15 ft. to 20 ft. the walls have since reached to their full height and the whole of the buildings are roofed in. The large ventilating scheme in the hands of Messrs. Ashwell and Nesbit is now being hurried forward, the main hot and cold air ducts, with hollow divisions constructed with Picking's partition bricks, were in an interesting state for inspection. The Delabole rag slating is nearly completed, whilst to the interior a considerable amount of faïence dressing, made by Messrs. Whitehead of Leeds, is fixed. Many of the corridors to the upper floors have plastered vaulted ceilings; the roofs of some of the physical laboratories are similarly finished and have good effects.

The buildings throughout are full of small matters of detail necessary to the purpose to which they are ultimately to be applied, and we cannot here attempt a description of even a few of them. Although the main front is yet hidden by a forest of scaffolding, it is safe to assume that when finished these buildings, which are eventually to become the headquarters of British scientific research, will have a position second to none in the educational institutions of the world.

Leeds Institute.—The students attending the building construction classes held at the Leeds Institute visited last Saturday the Leeds market hall and shops now in course of completion, from the designs of Messrs. Leeming and Leeming. The whole of the buildings were thrown open to the students, who were thus enabled to see the work in a partially finished state and to advantage. Details of construction were explained by Mr. James Neill (the teacher of the classes) in conjunction with the working drawings, which were also on view. There are 172 students in the building construction classes at the Institute, and during the latter half of the session visits are undertaken to buildings in course of erection in the city with a view of imparting practical knowledge.

ARCHITECTURAL SOCIETIES.

Edinburgh Architectural Association.—A meeting of the Edinburgh Architectural Association was held on the 17th inst. at No. 11, George-street, Mr. A. Hunter Crawford, President, in the chair, when Mr. Robert H. Pow, C.E., read a paper on "The Strength of Scaffolding. After referring to some opinions regarding the force of the wind, and factors of safety, he dealt with the subject of scaffoldings for steam cranes, and pointed out the weaknesses arising from imperfect general bracing and the dependence on girder connections between the towers. He alluded to the unsatisfactory stiffening secured by the use of cross girders, and stated that he preferred in all directions some form of bracing, the strength of which could be calculated. The lecture was illustrated with diagrams and models.

Devon and Exeter Architectural Society.—At a meeting on Tuesday, the 16th inst., Mr. Mowbray A. Green read a paper on "The XVIIIth Century Architecture of Bath," illustrated by lantern slides. He said that in the XVIth century Bath was but a small city and mostly contained within its ancient walls, which surrounded it roughly in the form of a circle of about 1,200 ft. diameter. A century passed before the use of the mineral water brought the city into repute, but about 1680 much was done to improve the buildings, and the visit of Queen Anne and the Prince of Denmark in 1702 and 1703 caused a large influx of visitors. During the first twenty years of the century Trim-street, Broad-street, Green-street, part of Chapel-court, Westgate-street, St. James's-street South, and part of Orange-grove were rebuilt, some of them being without the city walls. Widcombe House also belongs to this period (1727). It was now that the elder John Wood came to Bath and embarked upon large building schemes, such as St. John's Hospital, Chandos-buildings, and Allen's Town House, while John Straham, of Bristol, laid out Kingsmead-street, Avon-street, and Beaufort-buildings. In 1728 Wood began Queen-square and Gay-street on the north-west of the city, some of his best work being found here. Prior Park, that magnificent mansion on the northern slopes of Combe Down, followed in 1735, the North and South Parades on the site of the old Abbey Orchard in 1740-43, and several villas in the neighbourhood of the city, chiefly Belcombe Brook at Bradford-on-Avon in 1734 and Titan Barron Loggia at Bathford, 1748. The original plans and contract for the latter are extant and are of extreme interest as showing how the specifications were incorporated with the plans, the description of the carrying-out of each room being written on the plan within the walls of that room. The mineral water hospital was begun in 1738, and the Circus in 1754, the latter being the design of the elder Wood, though carried out by his son, who ably followed his father's work, and who in 1767 began the Crescent which was completed about eight years afterwards. It is not unlikely that Queen-square, Gay-square, the Circus, and the Crescent were all part of a great scheme which the elder Wood had contemplated before his death in 1754. In 1769 the younger Wood began the Assembly Rooms, an exceptionally well-planned suite of rooms costing 20,000*l*., a sum of money which would not cover much more than one-third of the cost of such a building at the present day. Alfred-street, Princes-buildings, and York-buildings were also the work of Wood, who died at Batheaston in 1781. Of the buildings which belong to the latter part of the century, Milson-street, begun about 1760, was probably the work of Robert Lightholder, who built the Octagon Chapel there in 1767. The Town Hall and markets were the work of Thomas Baldwin in 1775, the banqueting hall being, if anything, finer than the ball-room in the Assembly Rooms. In the last two decades of the century Baldwin built largely on the Pulteney estate on the other side of the river, and was also concerned with much of the design for the new pump-room, the northern colonnade and the façade of the King's Bath having been erected by him in 1786 and 1788 respectively. He was employed in Cheap-street, Bath-street, where the front wall of the houses has a colonnade under, and the Cross Bath, and in other improvements consequent upon the City Act of 1789. Towards the end of the century building had increased enormously, and among the numerous architects and builders John Palmer is most conspicuous, he having designed St. James's-square, Lansdown-crescent,

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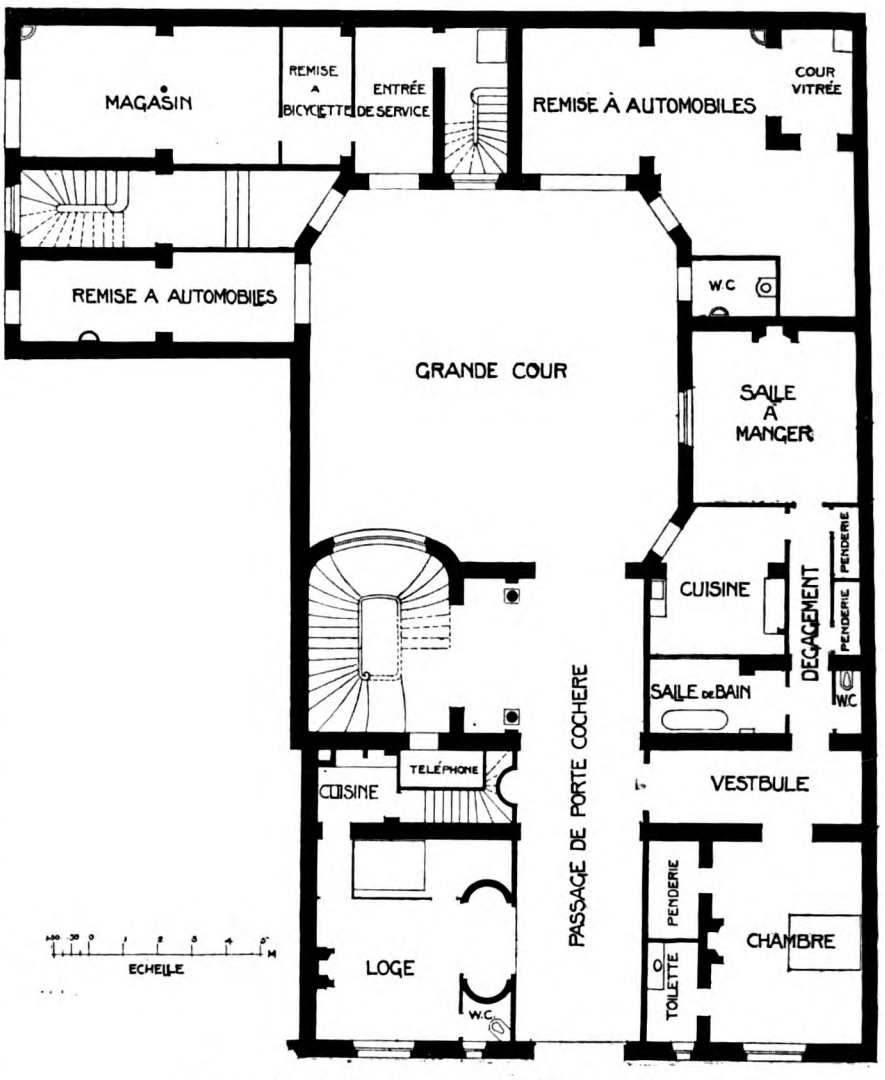
and many other buildings, while his façade to Kensington Chapel in 1794 is one of his best works. Generally speaking, the styles of the century may be divided into three groups—that of the first twenty-five years, when the houses had gabled roofs and façades with large sash windows surrounded by bolection mouldings, and when the interiors were panelled in wood almost throughout and the rooms small and comfortable; the next fifty years, when the work was modelled upon the strictly classic Palladian manner with rusticated basements, two stoned orders, a crowning cornice and parapets, with Mansard roofs, while the interiors become spacious and dignified and plaster work was brought into general use; and the last twenty-five years when the free manner of Robert Adam came into vogue and the strong methods of the earlier work gave way to detailed and abundant decoration.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The fourth meeting of the session was held on the 17th inst. at 32, Sackville-street, Piccadilly, Mr. C. H. Compton, J.P., in the chair. Mr. I. Chalkley Gould exhibited a plan of the 48 acres of land recently presented by the Duke of Norfolk to the City of Sheffield, and congratulated the Association on its petition to the Duke, which, associated with a similar petition from the Free Libraries and Museums Committee, had secured the important earthworks on Wincobank from the destruction which threatened them. The Duke, in giving the land for a park, had expressed his wish that the ancient camp thereon should be preserved in accordance with the suggestions made in the above petitions.—Mr. W. J. Nichols then read a paper dealing with "The Chislehurst Caves and Dene-holes" and the results of a further study of them since the reading of his first paper upon this subject before the Congress at Sheffield last year. Recently a very careful survey of these caves had been made by experienced mining engineers, and an accurate plan of the workings already cleared out has been made, and was exhibited to illustrate the paper. Mr. Nichols considers that the result of these careful studies goes a long way towards proving that these chalk galleries have been the work of successive ages. The earliest are those which, by way of distinction from the outer and inner series of workings, are now known as the middle series; and, as these are immediately connected with the dene-holes, they are, in his opinion, of Celtic origin, and bear the impress of a people advanced in art. The width of the galleries varies, but may be taken at an average of 9 ft., narrowing so considerably towards the roof as to give them the appearance of an arcade. One thing of importance has been proved by the plan—viz., that most of the principal passages of this great labyrinth converge at the well chamber, showing that the excavations were carried out on a systematically conceived plan, and were the work of competent men. The outer series of galleries, Mr. Nichols thinks, may be Roman; here the passages run in straight lines, and at right angles, and are wider and less carefully finished than those of the middle series. The walls, however, are not in the same condition as originally formed, a later people, perhaps so late as the XVIIIth century, having cut and hacked them so far as the pick would reach until, in most places, all semblance of their original form has been lost. From these outer workings the Romans doubtless derived vast quantities of chalk needed for conversion into lime, cement, or mortar for use in the construction of their great works of fortification, public buildings, embankments, etc., and road-making in London and Southwark. The ancient trackway, which ran from the head of the camp at Chislehurst and passed through Elmstead Wood and Blackheath to Watling-street at Deptford would afford facility of transport to the barges at Deptford, whence the city would easily be reached.—Mr. R. H. Forster followed with a paper upon the same subject, which was illustrated by plans and sections prepared from the survey made by Mr. T. E. Forster quite recently. He said these caves are extensive for chalk workings, but the part surveyed covers less than 20 acres. They are chalk mines, and bear a strong resemblance to old coal workings near Newcastle, especially in the careful dressing of the walls in some parts. In the middle mine the system followed has been that of removing the upper chalk first, leaving a "bottom canch" to be worked later; in the outer and inner mines the lower chalk was first worked, leaving a "top canch," which was brought down afterwards. The "altar-tables" are pieces of the "bottom canch" which have not been removed. The "dene-hole chambers" are places where the "top canch" has not been "dropped." The beehive shape of the recesses is the natural result of mining operations. The "well" was possibly a shaft sunk to test the depth and quality of the lower chalk, and may have been first used as a well in connexion with the underground garden. The outer and inner mines are in their original state, and there is no reason to think that their pillars have been stripped. The supposed dene-holes are falls of the roof caused by mining. The three mines are of about the same date; the narrow connecting passages have been driven from the middle mine to prove the position of the others. This and other points show a knowledge of surveying which precludes an early date. The only clue to the age of the mines is their resemblance to old workings near Newcastle, probably about 200 years old. Some of the chalk may have been sold for ballast, an immense quantity being required by ships bringing North Country coal. Much would also be used for lime burning both at Chislehurst and beside the Thames. There are no certain traces of dene-holes in this part of Chislehurst, and dene-holes generally were probably chalk mines, an explanation which had been rejected on insufficient grounds. The Essex dene-holes supply the connecting link between the bell pit and the galleried mine. Open quarrying is not necessarily easier or cheaper than mining, and surface chalk is not so good for agricultural purposes. The amount of chalk used in the course of many centuries for various purposes is quite enough to account for all the excavations in Kent and Essex. Although Mr. Forster differed from Mr. Nichols in his views regarding the great antiquity of these caves, he said the subject was one of very great interest, as very little was known of the archæology of mines and mining. Mr. Nichols, having been obliged to leave before the conclusion of the paper, was unable to take part in an interesting discussion which followed. Before the meeting separated, the Hon. Secretary, Mr. Patrick, announced that, by invitation of the Mayor and Corporation of Bath, the Congress this year would be held in that city, probably from August 8 to 13.



House, Rue Fabert, Paris. Plan of Ground Floor.

Illustrations.

DESIGN FOR A CRESCENT.

THIS is the design sent in competition for the Tite prize at the Institute this year, under the motto "Red Shield," and which Mr. Phené Spiers, in a letter in our columns at the time, maintained had been most unjustly or carelessly passed over, and ought to have had the prize. We do not know that we should go so far with Mr. Spiers as to say that positively, but we certainly think that it ran the prize very close, and that, at all events, it should have had the second place. We are, therefore, very glad to do justice to the ability shown in the design by publishing it, in spite of the unaccountable neglect of the Committee of Selection.

The author is Mr. Robert Atkinson, of Nottingham.

PREMIATED FAÇADES, PARIS FAÇADE COMPETITION.

WE give illustrations of two of the new street façades in Paris which have received premiums in the annual competition for awards for the best executed fronts of new buildings which has been established in Paris.

The character of the two designs shows clearly that there is no intention on the part of the authorities of promoting any special school or style of architecture. That by M. Nénot, the eminent architect of the new Sorbonne, is a severe and restrained design on academical lines. The illustration is taken from a photograph.

The other design, by M. Hodanger (a name

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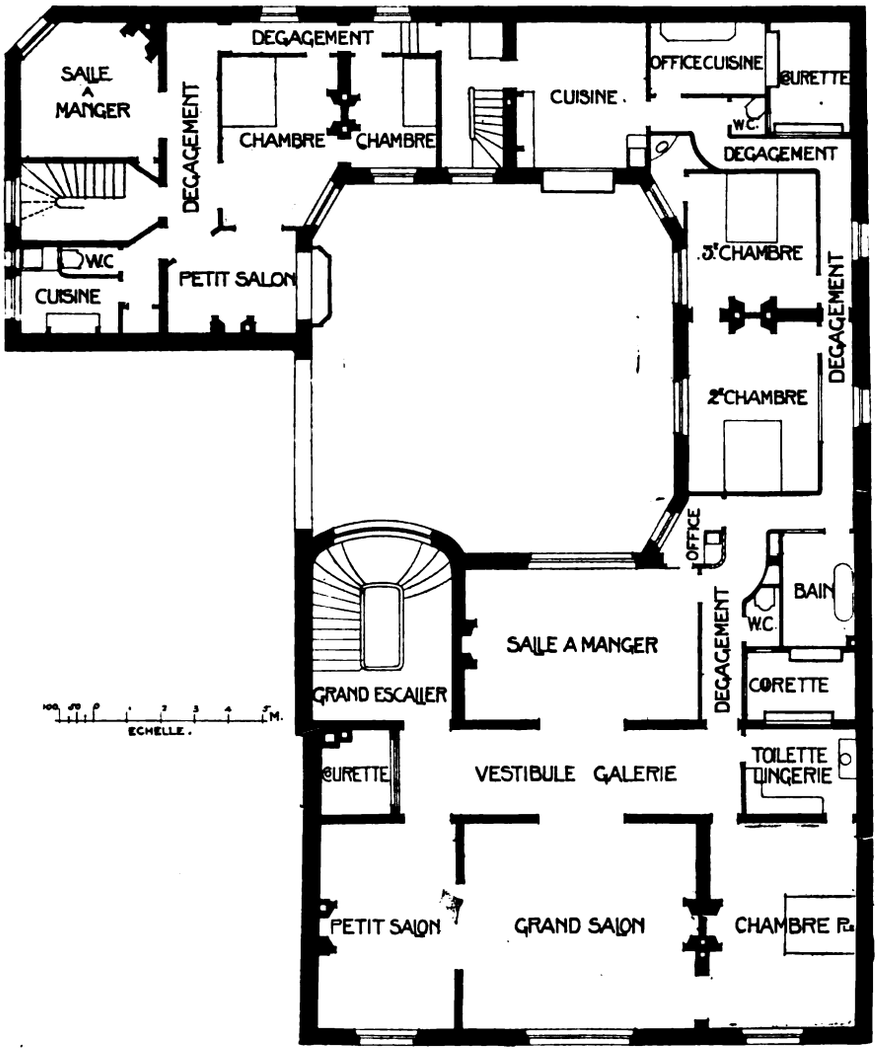


House, Rue Fabert, Paris. Plan of Upper Floor.

new to us), is reproduced from the architect's drawing, and is, as will be seen, an example of quite a different order and of the most ultra-modern style. We give the plans of two of the floors, as the arrangement of a Paris apartment house of this kind is of some interest. It is very compact, and the most is made of the space; but the close contiguity, at one point, of a water-closet to the kitchen, from which it is lighted by a borrowed light, shows that French architects are still under the influence of rather primitive ideas on sanitation.

The building covers a surface of 3,000 ft., at a total cost amounting to 3*l.* 9s. per super. ft. The apartments looking to the courtyard are let at an annual rental of 50*l.*; those looking on the Esplanadedes Invalides at from 200*l.* to 280*l.*

THE GABLES, NIGHTINGALE-LANE, CLAPHAM COMMON.

THE materials used externally are Portland stone, red facing bricks, and the roof covered with green slates.

The arrangement of the plan is largely due to fixed building lines on two sides and also to the desire to preserve two fine oak trees.

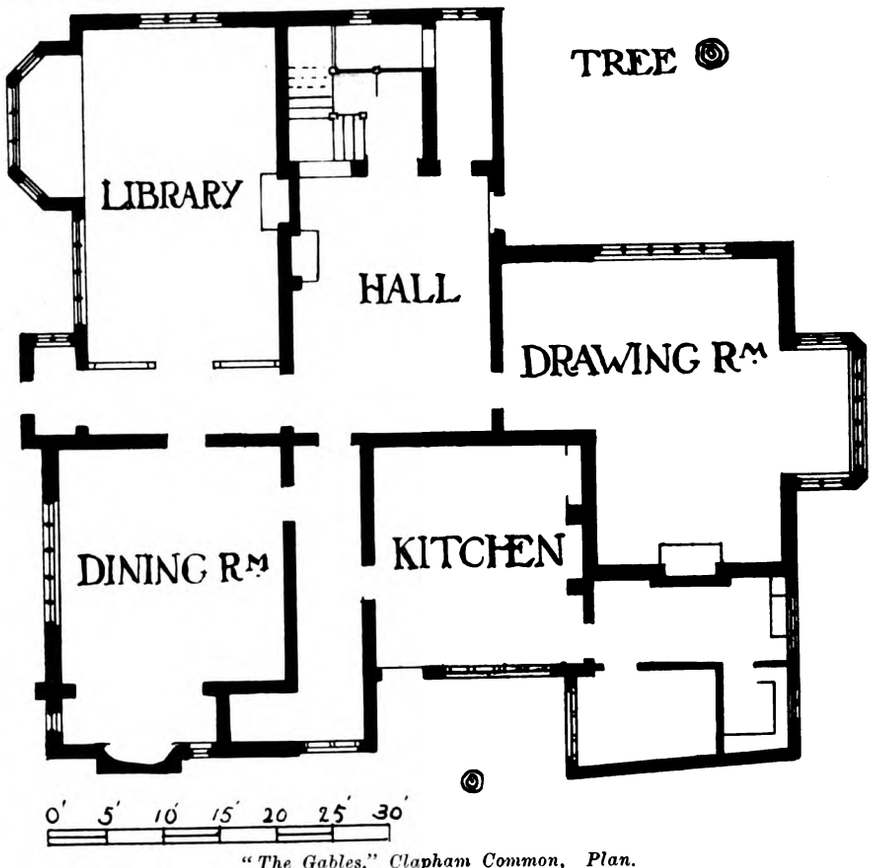
The principal feature internally is a two-story hall with a wide corridor running behind an open arcade at the first floor level, and leading to the principal bedrooms.

The drawing was exhibited at the Royal Academy a year or two back.

J. LEONARD WILLIAMS.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—A large number of the members attended the visits on the 20th February, when the Colonial Consignment and Distributing Company's Frozen Australasian Meat Store, Nelson's Wharf, and Hay's Wharf and Dock, Tooley-street, were open to their inspection. At the former they were shown over by the Chief Engineer, Mr. C. S. T. Molesey, and Mr. J. H. Holton; and at the latter by Mr. Arthur E. Williams, representing the makers of the refrigerating plant—Messrs. H. Pontifex and Sons. At Nelson's Wharf cargoes of frozen beef and sheep are received in barges loaded from ships in the docks and in the river, and have to be raised to the sixth or "Receiving and Distributing Floor" by hydraulic cranes, and elevators termed "Sheep Syphons." The latter are endless chains having arms upon them across which the sheep are laid, and are driven by a 3-cylinder Brotherhood hydraulic engine, and deliver the sheep on to a receiving table on the distributing floor. The apparatus is adjustable to the position of the barge at any state of the tide and whilst at work. From the table the sheep are sorted on to trucks, and conveyed by hydraulic jiggers with wire-rope suspended cages on to the various floor-levels of the cold rooms; from which they are again raised by similar means when required for distribution, the trucks being lowered to the courtyard level van-loading platform by hydraulic direct-acting lifts. There are nineteen hydraulic elevating machines, made by Messrs. Waygood and Co., eight of which, together with a steam-driven sheep-elevator on the jetty, are capable of dealing with barge cargoes. It is therefore a comparatively easy matter to receive 10,000 or 12,000 sheep per day as an ordinary day's work; whilst as many as from 17,000 to 20,000 sheep in and out of stock have been handled in one day. Two systems of refrigeration are installed. One, the De La Vergne direct-expansion of ammonia process, for which there are two machines, each of 80 horse-power with 12-inch by 24-inch double-acting compressors, and compound-condensing steam-cylinders, with about 12 miles of 2-inch expansion pipes in the cold rooms, made by Messrs. L. Sterne and Co., of Glasgow; the other system is a cold-air compression and expansion machine of about 300 horse-power, made by Messrs. Haslam and Co., of Derby, with air-distributing ducts formed in the concrete foundations of the building, but which is seldom used. The "defrosting" plant is the invention of Sir Montague Nelson, and consists of a series of rooms fitted with ammonia expansion pipes, and steam-heating pipes, etc., the purpose of which is to thaw out, or "defrost" beef and mutton to the extent of 4,500 sheep and 2,000 quarters of beef per week, giving a daily output for market deliveries. The following figures afford striking evidence of the magnitude to which this trade has developed during the 24 years it has been in existence. During the year 1903 no fewer than 5,063,013 carcases of frozen sheep and lambs, and 137,679 quarters and pieces of beef arrived here from New Zealand and Australia alone (without counting 3,118,488 sheep and lambs, and 565,869 quarters of beef from the River Plate), a total of 8,181,501 frozen sheep and lambs, and 703,548 quarters of beef in the year.



"The Gables," Clapham Common, Plan.

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COMPETITIONS.

LIBRARY FOR HERNE HILL.—At the meeting of Lambeth Borough Council the Libraries Committee brought up a report recommending that the design of Messrs. Wakeford and Sons for the new Herne Hill Library be accepted, and that the sum of 15*l.* 15s. be paid to each of the five architects next in order of merit. To the motion for the adoption of the report an amendment was proposed to the effect that the whole of the designs be submitted to an independent architect to be nominated by the President of the Royal Institute of British Architects. On behalf of the Committee, it was argued that, as the members of the Committee had themselves settled the ground plan beforehand and the arrangement of the different rooms, the principal question remaining in the examination of the designs was the elevation of the building, or, in other words, its external appearance. That question was, the Committee submitted, mainly an æsthetic one, and they conceived that if an assessor was appointed he would in this case advise the Council whether the conditions had, or had not, been complied with, and would leave the Council its own taste and discretion as to the artistic or inartistic appearance of the building, and to decide accordingly. The amendment was negatived, and the report was adopted.

STOCK EXCHANGE, MANCHESTER.—The new Stock Exchange, which is to be built in Manchester, will occupy the whole site within the confines of Norfolk-street, Kent-street, Sussex-street, and Pall Mall. Six architects—five from Manchester and one from Bolton—have been selected. They will submit designs to the Stock Exchange Buildings Company, and towards the end of April a choice will be made. The land has already been secured, and on the expiration of the lease on which the existing tenancies are held (at midsummer) it is proposed to pull down the old buildings and erect a new building suitable for a Stock Exchange. Part of the building will be used as offices.—*Manchester Guardian.*

BOOKS RECEIVED.

THE ROYAL INSURANCE COMPANY'S BUILDING, LIVERPOOL. Edited by J. Newby Hetherington. (B. T. Batsford. 21s.)

BOUNDARIES AND FENCES. By Arthur J. Hunt and Henry Stephen. (Butterworth and Co.)

VENEERING, MARQUETRY, AND INLAY. By Percy A. Wells. (Percival Marshall and Co. 6d.)

CALCULATING TABLES. By Dr. H. Zimmermann. Translated into English by L. Descroix. (Asher and Co. 6s.)

HANDBOOK OF TECHNICAL TERMS USED IN ARCHITECTURE AND BUILDING. By Augustine C. Passmore. (Scott, Greenwood, and Co. 7s. 6d.)

TRANSACTIONS OF THE INSTITUTION OF CIVIL ENGINEERS OF IRELAND. Vol. xxix. (Dublin: John Falconer.)

TRADE CATALOGUES.

THE Empire Roller Bearings Company send us a catalogue of their roller bearings suitable for rolling-stock and rotary machinery of all descriptions. A departure announced in the present circular is a new series of bearings for shafting and trolley work, these bearings being produced in the form of plummer blocks at prices which should have the effect of encouraging their employment more largely than heretofore. The economy claimed for these bearings is said to be equal to fully 50 per cent. in the power required for driving shafts, and to as much as 50 per cent. to 75 per cent. in lubrication generally.

We recently received from the General Electric Co. of Queen Victoria-street, a copy of their progress sheet for January, 1904. Reductions in price have been made in cut-out and distribution boards. A very cheap form of high-pressure pressel switch, similar to the pear switches used for electric bells, ought to become popular. We were favourably impressed by the method of plugging walls described in this leaflet. By the use of a tool called a "jumper," a hole of the proper size is readily made in brickwork, plaster, or masonry, with the minimum damage to the surroundings. A "limpet" plug made of well-seasoned wood is then inserted in the required position, and the wedge hammered home. The plug will hold any nail or screw very satisfactorily, and the whole operation need not take more than a minute. When properly inserted the face of the plug is flush with the wall.

We have received from the Edison and Swan Company, Ltd., a number of leaflets describing various novelties which they are putting on the market. They sent us at the same time a "critical notice" of them. Whilst we are always pleased to get letters from manufacturers pointing out what they claim as novel in their catalogues, yet their own "critical notices" can only appear in our advertisement columns.* Amongst other novelties described we notice a "safety" tumler switch for high voltage circuits. It is said to be able to break a current of five amperes at a pressure of 300 volts. If it is able to do this satisfactorily then in our opinion a very considerable advance has been made in the design of high voltage switches. We would suggest to manufacturers that if they got their switches rated by an outside authority electricians would be able to judge between the relative merits of switches made by different makers. At present what one maker rates as a five-ampere switch another will rate as a fifteen-ampere switch. This lack of uniformity is possibly due to the unsatisfactory nature of the Institution Rule for the rating of switches. Other leaflets describe flexible cords and patent pear switches for use on high voltage circuits. Many new designs in table standards, electroliers, and pendants for the electric light are also described.

The Mork Patent Pulley Block Co. send us their price list of High-grade Lifting Tackle, containing particulars of the "Mork patent" worm-geared pulley block, with quick return gear and self-sustaining brake. The important advantage possessed by this mechanism is that by pulling the chain connected with a lever, the worm can be thrown out of gear, thus permitting the empty hook to descend by its own weight. Similarly, when loads are being lowered, the empty hook can be rapidly raised to the required height by simply pulling the loose end of the load chain. By pulling the hand chain in either direction the worm is dropped instantly into gear, and the block is again transformed into a work geared pulley block. It is evident that the time saved by a pulley block which possesses these facilities must be a very important item to contractors and others. These blocks are made in various sizes, suitable for loads from one to ten tons.

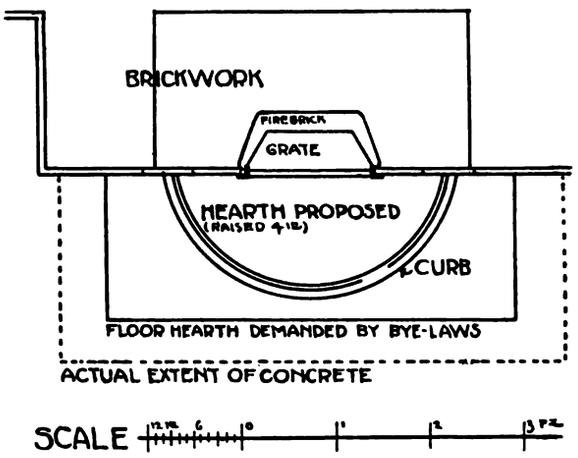
The General Electric Company, of Queen Victoria-street, have sent us a catalogue of their "Geeko" fire-alarms. Descriptions are given of many forms of automatic and "actuated" alarm devices. We think highly of a new and simple form of self-adjusting thermostat described. The drawback to the usual form of automatic thermostat is that it requires continual adjustment if it is to be always very sensitive. It is generally agreed that a sudden rise of 25 deg. F. ought to be sufficient to actuate an alarm device. This leaves very little margin for differences of temperature due to the seasons. The principle utilised in the automatic fire-alarm illustrated in this catalogue is that a thin copper wire has a much larger coefficient of expansion for heat than an iron strip. It acts if there is a sudden rise of 25 deg. above the normal, and automatically adjusts itself for slow changes of temperature. We note also that the General Electric Company have reduced the price of their main switches and that they have made considerable improvements in the design of cut-outs.

* This is, however, we have reason to believe, the way in which many of these laudatory notices of inventions and patents get into the daily papers. We have had such "critical notices" sent to us, and, of course, refused to pay any attention to them, and a day or two afterwards have read the identical notice in a daily paper. The ordinary daily press staff, as a rule, have no scientific knowledge; it is not thought worth while to pay for scientific opinion; the patentee sends a readable technical paragraph setting forth the merits of his invention, and this saves all trouble and is inserted in the paper as an expression of editorial opinion! They might at least have the conscience to insert "advt." after it.

Correspondence.

THE PUBLIC HEALTH ACTS.

SIR,—As another example in support of the urgent need for a commonsense drafting of building by-laws in the form of an intelligent enunciation of "principles of sound construction and sanitation" (instead of, as is now the case, the futile putting forth of effort to specify beforehand the details of the application of such principles to conditions of the future which can only be known when they arise) will you please allow me to cite the Liverpool method of controlling the construction of hearths?



The By-law (L.I.A., 1882, 35 (1) (2)) reads as follows:—

(1) Every fireplace-opening or chimney-opening in a domestic building shall have a sufficient hearth or horizontal slab of durable and incombustible material at the level of the floor extending throughout the length and depth of such opening, and to a distance of at least 18 in. beyond the face of the chimney breast, and at least 6 in. beyond each side of the opening of the chimney piece.

(2) Every such hearth shall be laid upon a bed of mortar, concrete, brick, or other compact and incombustible material, having a depth of at least 6 in. below the upper surface of the hearth, and in no case shall the hearth be supported or rest on wood or timber.

Now, when this by-law was drafted, it was, presumably, not anticipated what would be required to meet the contingency of the present-day use of "well-fires," instead of the ordinary form of grate in vogue at that time. Consequently, when it is now found that a convenient form of hearth to use with a "well-fire" (in order to render it safer from spreading fire, and to provide for air inlets to the underside of the fire bars) is one which is raised above the level of the adjacent floor, and also that it is less of an obstruction to the floor-space, and, maybe, more effective in appearance to give the hearth a semi-circular shape, on plan, then, forsooth, the precious "positive" by-law comes into play, and this natural development in building which would otherwise take place is prohibited by the local authorities, "because it is against the by-laws," and not by reason of faulty construction. And, lest there should be any doubt as to this being the position taken up by the Liverpool Corporation, I may say that a "notice to amend" has been actually served upon the contractors in the case to which I refer.

This instance being an apt one in general illustration of the hindrance which the present system of drafting building by-laws places upon due progress and economy in building, I beg leave to send herewith drawings in further explanation, from which it may be noted what is considered by the local authorities to be

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necessary, according to the by-law quoted, to render the hearth safe from the risk of spreading fire. It will be seen that two triangular pieces of wood flooring have been removed and replaced by concrete, and that then the cork carpet with which the floor is covered has been laid over the concrete; and that the iron curb fixed round the hearth to bind it together has a lip which stands up one inch above the plane of the hearth. To make the absurdity of this example more obvious, it may be mentioned that were the hearth made oblong in shape of the specified size and fixed on a level with the floor there would be no one inch lip nor fender nor curb demanded, and the cork carpet might be laid, not only over the two triangular pieces of hearth, but also be continued over the entire hearth, including, in the case of an ordinary description of grate, the back hearth as well. I leave your readers to determine the exact degree more safe from the risk of spreading fire which the required close adhesion to the building by-laws will render this particular hearth than as it was intended; and also to judge the precise practical utility of this "positive" by-law, as it stands, in respect of hearths in general. But I think it would be difficult to cite a more instructive case in favour of building by-laws being made as the enunciation of "principles of sound construction and sanitation," instead of purporting to specify beforehand a complete category of building construction suited to meet all possible contingencies which might arise, and of detailed particulars of effective compliance therewith.

T. MYDDELTON SHALLCROSS.

Liverpool, February 15, 1904.

WALTHAM ABBEY TOWER RESTORATION.

SIR,—It is suggested that pinnacles should be added to the top of this interesting tower. As the oldest print available, reproduced in "Abbeys Around London," shows no such finish, but battlements, it is sincerely to be hoped that the traditional features and the character of the tower may not be obliterated by the addition of what the architect never intended.

JOHN A. RANDOLPH.

The Student's Column.

ARCHES.—IX.

THE theory of the masonry arch is by no means free from complexity, and it can scarcely be said that there is even a general agreement between various writers on the subject. Numerous theories have been propounded from time to time based on different underlying assumptions, which are rarely defined so clearly as might be desired.

It would be impossible in a series of articles such as the present to include a fully detailed consideration of theories intended to elucidate the action of the arch. Nor would an attempt of the kind serve any useful purpose, for mathematicians have written bulky volumes on the subject without carrying conviction to the minds of their fellows, or clearing away the mists of obscurity from the minds of their less accomplished readers.

We propose, therefore, merely to state and, as far as possible within the limits at disposal, to elucidate some of the theories generally accepted by engineers, referring our readers to treatises wherein more fully detailed methods of discussion are adopted.

From previous articles, intended to dispose of various preliminaries necessary to enable students to follow and appreciate the points now to be raised, it has doubtless been gathered that no theory of the masonry arch can be more than approximately true. We have already shown in Art. VII. the inexactitude of results afforded by computations relative to the amount and distribution of the external forces, and the impossibility of determining the position of the true line of resistance with any close approach to accuracy.

These unavoidable difficulties account in great measure for the uncertainties attending the application of theories to arch construction, while other reasons are to be found in the customary disregard of the adhesion furnished by the mortar, and in the general want of data relative to the actual strength of masonry. Further, the strains in a masonry arch cannot

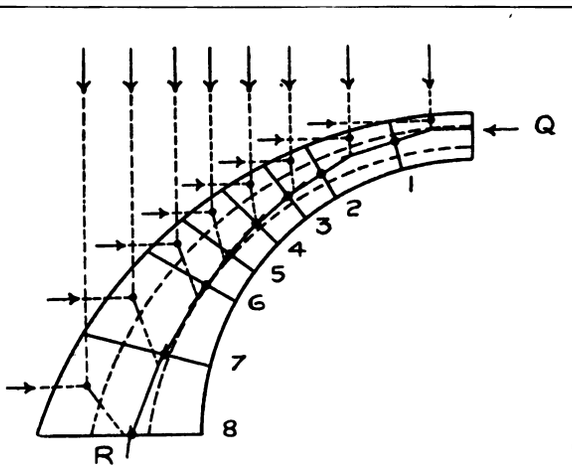

Fig. 47.

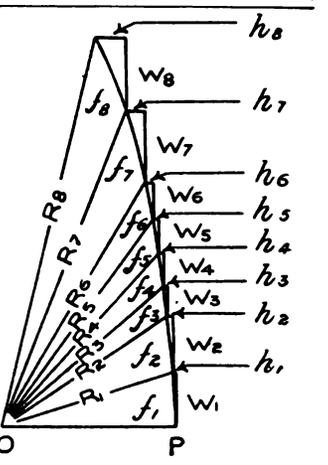

Fig. 48.

be precisely determined because of variations: (1) in the physical properties of the material employed; (2) in the quality of the workmanship of the masons who dress and lay the stones; (3) in the action of the centring, due to differences in stiffness and methods of striking; (4) in the spreading of the abutments; and (5) in the settlement of the foundations. None of these causes may effect any noticeable alteration of form, but their individual and joint action must clearly be felt by the structure.

However unerring mathematical reasoning may be, and however precise the means provided for the application of such reasoning, it is absolutely impossible to arrive at results unless adequate and accurate data are forthcoming. Consequently every theory is but an approximation. Nevertheless, as the effect of variation in any one of the factors enumerated above can only be estimated by a clear appreciation of the relations mutually existing between all the factors, the rational design and execution of arched structures should only be conducted by those who possess familiarity with theoretical methods.

A striking proof of the limitations characterising all theories hitherto proposed is to be found in the universal acknowledgment of the fact that every theory of the arch is nothing more than a method of verification. There is no such thing as a theory that will enable the architect or engineer to construct an arch in his mind or to build it up step by step, either figuratively on paper, or materially upon the actual site.

The usual process of designing an arch may be thus summarised:—

(1) The general dimensions are hypothetically settled, or taken from those of an existing arch of known stability, or fixed by the aid of some empirical formula.

(2) The loads are computed, and the assumed arch is tested by the theory selected. The line of resistance is drawn, and if this does not lie within the prescribed limits, the dimensions must be altered and the design must be tested again. If necessary, the process must be repeated until the conditions of stability are fully satisfied.

It is a somewhat humiliating thought that the resources of modern engineering science carry us so little beyond the methods of the ancient Romans. The first step in the design of an arch remains very much as it was 2,000 years ago, while the second stage, which is merely that of verification, is only improved in the respect that we adopt mathematical tests, while the arch builders of old applied tests furnished by practical examples.

That the modern method of verification is more precise, and logically leads to greater economy of material, no one will deny. Whether it leads to greater strength and durability may well be doubted in view of the wonderful structures that still survive as mementoes of the greatest builders of masonry arches the world has ever known.

The first theory of the arch to which we will direct attention is founded upon the hypothesis of least thrust at the crown, but, although due recognition is made of the horizontal components of the external forces, the results obtainable are only approximately accurate, owing to the uncertainty always existing with regard to the determination of the external forces themselves.

This theory may be illustrated most conveniently by a further employment of the data given by Professor Baker relative to the semi-arch represented in Fig. 46, p. 200. In what follows we assume the dimensions and the working conditions to be those already taken. Consequently, the maximum thrust at the crown is that given in Table I.

Having drawn the semi-arch to scale and represented the vertical and horizontal forces, as in Fig. 47, and having the necessary data in Table I., the force diagram is constructed, to any convenient scale, in the manner described below.

Lay off, as shown in Fig. 48, the line O P to represent the maximum crown thrust as given in line No. 4 of the last column in Table I. From P lay off the vertical force w_1, and from its extremity the horizontal force h_1. A line drawn from P to the left-hand end of h_1 will then represent the direction and value of the external force f_1 acting upon the first voussoir, and the line R_1, drawn from O to the upper end of f_1 will represent the resultant pressure of the first voussoir upon the second voussoir.

In the same manner lay off w_2 from the left-hand end of h_1, and h_2 from the end of w_2. Then f_2 will represent the resultant of the vertical and horizontal external forces, and R_2 the resultant pressure of the second voussoir upon the third voussoir.

By laying off lines in a similar manner to represent the vertical forces w_3, w_4, w_5, w_6, w_7, and w_8, and the horizontal forces h_3, h_4, h_5, h_6, h_7, and h_8, the directions and values of the forces f_3, f_4, f_5, f_6, f_7, and f_8, and the resultant pressures R_3, R_4, R_5, R_6, R_7, and R_8 can be determined.

In the diagrams of the semi-arch the points of intersection of the vertical and horizontal forces acting upon the several voussoirs are shown in Fig. 46, p. 200, by small circles, and in Fig. 47 by circular dots, the inclined lines passing through these points indicating the directions of the resultants of the external forces which act upon the several voussoirs.

Next construct the line of resistance by drawing from the point of application of the thrust Q—at the upper boundary of the middle third of the crown joint—a horizontal line intersecting the inclined line of force passing through the first voussoir.

From the point of intersection draw a line parallel to R_1, and produce it to intersect the inclined line of force passing through the second voussoir.

By continuing this mode of procedure down to the springing of the arch, a polygon is obtained generally similar to the polygon *m n o p* in Fig. 35, p. 113.

The points of intersection of the several lines parallel to the series R_1 to R_8, in Fig. 48, with the joints Nos. 1 to 8, indicate the centres of pressure on the various voussoirs composing the arch ring. For the purpose of identification a small circle is described in Fig. 47 about each centre of pressure, and a line connecting the centres of pressure would be the line of resistance. Owing to the small size of the diagram this line has not been drawn, as its approximation to the line of pressure would cause confusion.

Finally, enquiry should be made as to the stability of the proposed arch.

(1.) *Stability against Failure by Rotation.*—As the line of resistance evidently lies wholly within the middle third of the semi-arch ring—the boundaries of the middle third being indicated in Fig. 47 by dotted lines—and would touch the inner boundary of the middle third of the complete arch at two points, and the outer boundary of the middle third at one

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point, the factor of safety against failure by rotation is 3 (see Article VI., p. 142).

(2.) *Stability against Failure by Crushing.*—To ascertain the unit working pressure, formula (2) must be applied, as explained on p. 142.

As at the crown of the arch, $d = \frac{1}{8}l$, the equation reduces to, $P = \frac{2W}{l}$.

In this case the values of the factors are :—

$W = 9{,}400$ lb., and $l = 1{\cdot}25$ ft.

Substituting these values in the equation we have

$$P = \frac{2 \times 9{,}400}{1{\cdot}25} = 15{,}040 \text{ lb. per square foot.}$$

At the springing of the arch the values of the factors are

$W = 21{,}700$ lb., $l = 4{\cdot}5$ ft., and $d = 0{\cdot}10$ ft.

Substituting these values in equation (2), we have

$$P = \frac{21{,}700}{4{\cdot}5} + \frac{6 \times 21{,}700 \times 0{\cdot}10}{(4{\cdot}5)^2}$$

$= 4{,}820 + 643 = 5{,}463$ lb. per square foot.

The ultimate resistance of limestone rubble masonry generally varies between 180,000 lb. and 260,000 lb. per square foot, and using a factor of safety of 8, we may assume the permissible unit load to be from 22,500 lb. to 32,500 lb. per square foot, while the safe loads for coursed rubble and ashlar masonry in limestone are considerably higher, and for granite ashlar higher still.

Hence it becomes evident that the maximum unit working pressure of 15.040 lb. per square foot, as found above, is so far below the safe limit for the commonest form of masonry, that the question of stability against crushing requires no further consideration.

It may be remarked, however, that if the maximum pressure is calculated to be greater at any joint than the permissible load for the type of masonry selected, it is necessary to increase the depth of the arch ring, and to repeat the process of computation described above. If the result is found to be unsatisfactory, the depth must be further increased, and tested, until the conditions necessary for safety are fully assured.

(3.) *Stability against Failure by Sliding.*—We have already shown (in Article VI., p. 142) that stability in this respect depends upon the angle made by the lines of pressure with the normal. Examination of Fig. 47 will show that the smallest angle between the lines of resultant pressure and the several joints is at No. 8—the springing joint. It will be sufficient to inquire into the safety of this joint, as its stability against sliding is less than that of any other in the semi-arch. The difference between the angle at the joint in question and the normal is (90 deg.—72 deg.) = 18 deg., and the tangent of 18 deg. = 0·33. As the co-efficient of friction for masonry with wet mortar is not less than 0·50, the factor of safety is $(0{\cdot}50 \div 0{\cdot}33) = 1{\cdot}5$, at least. But the co-efficient of friction even with slightly damped mortar is usually 0·70, and using this value the factor of safety becomes $(0{\cdot}70 \div 0{\cdot}33) = 2{\cdot}1$.

The factor of safety for each of the remaining joints can be calculated in a similar manner after measurement of the different angles.

In practice it is seldom the case that an arch will be unstable as regards sliding if it has been shown to be safe against failure by rotation, and failure by crushing of the material. If, however, such a contingency should be feared, a slight alteration in the direction of the joints may be effected so as to increase the value of the angle formed by the lines of pressure with the normal.

In circular arches the joints are usually made radial, a practice which ordinarily satisfies the requisite conditions. The joints in Fig. 47 will be found radial to the intrados, an arrangement which affords a little less stability against sliding than if they were radial to the extrados of the ring.

The foregoing demonstration simply furnishes a general solution for symmetrical loads, and we will next consider other applications of the theory.

HIGHER GRADE SCHOOL, CANTON, CARDIFF.—The new higher grade school at Canton, Cardiff, will be built on a portion of the site at present occupied by the Canton Cattle Market, and the school entrances will be in Market-road. The architects are Messrs. James and Morgan. The walls are to be built with local stock bricks, faced externally with suitable red pressed bricks. The structure is expected to cost about 20,000*l.*

ROYAL COMMISSION ON LONDON LOCOMOTION.

AT the sitting of this commission on Thursday last week evidence was given by Mr. Albert Gray, counsel to the Chairman of Committees in the House of Lords (Lord Morley). Witness dealt at some length with present Parliamentary procedure, and then proceeded to speak of the proposed establishment of an Advisory Board to deal with the whole question of London locomotion. Such a body could make annual reports to Parliament, in which they would make suggestions for improving means of communication. Promoters of all light railway and tramway schemes should place their schemes before that body. Answering questions by various members of the Commission, witness said that he saw considerable difficulties in the giving of powers to such a Board outside Parliament. It would be difficult to say what powers such a Board should have. There was no doubt that many of the minor local authorities took too parochial a view of many schemes for improvements in facilitating traffic, and in the circumstances there was doubtless a need for such a Board, which should consider not only those proposals brought forward by promoters, but also those that ought to be brought forward by promoters.

On Friday evidence was given by Sir Theodore Martin, K.C.B., who has had forty years' experience as a Parliamentary agent, principally in the promotion of and opposition to Railway Bills. Witness said he was opposed to the appointment of a Special Tribunal to deal with the question of London traffic, as he considered it would be very expensive, and, with regard to railway schemes, the interests involved were so enormous that on Parliament must be the responsibility of deciding. Such matters as the opening of streets and so on could be left to the local authorities. With regard to tube railways, he felt that seeing that many had been authorised, they had better wait until they were completed to know what needs were left unprovided for and how far they were favoured by the public so as to yield a fair return on the capital invested. He felt that tube railways were yet in an experimental stage, and it was not yet proved that they were what they should be as regarded ventilation, risks to life, and so on.

Mr. C. S. Meik was recalled and examined by Sir John Wolfe Barry on the question of new streets for London. The general conclusion he had arrived at was that the present need of London was improved streets, and that was the cardinal point to which he had given his attention. He wished to utilise the way leave, which the construction of a new street would give, in order to provide railway, tramway, and motor accommodation. The combination of the two would render both more feasible from the point of view of expense. His proposal was to have an open deck and a lower deck, and the heavy traffic would be carried on the lower road and the lighter traffic on the upper. All the through traffic would go through on the lower deck. To get access to the higher road, he proposed in some cases inclined roads at the back of the houses and in other cases by inclined roads in the centre of the avenue. The main avenues from north to south and from east to west should be 160 ft. wide. A considerable portion of the lower road would have to be artificially lighted, and he did not propose to have shops on the lower road. This would be devoted to basements and warehouses for the shops above. The upper road would be a substitution for the frontage as now existed in Oxford-street and the Strand.

Sir J. Wolfe Barry:—What occurs to me if this is the case is, what is the advantage of raising the road; why not lower it?

Witness said that if they lowered the road and caused the heavy traffic to go along that lower road it would mean many ups and downs at cross roads. Further, they had to deal with the question of the river, and if they sunk the road they would get into a difficulty, for the ground level on the south side was below the river level. They had approached the matter from all points of view, and came to the conclusion that the two-decked street was the best scheme. They would not be sacrificing any frontage, and there would be the frontage on the lower level. The foot passengers would go on the upper level, until it came on to rain, and then they would probably go below. The elevated railway would be suspended in the middle of the road on the upper deck, and underneath would be the motor road, with tramways on either side. He estimated that the average cost of the double-deck avenue would be 605,000*l.* per mile, and the average cost of the single-deck avenue would be 180,000*l.* per mile.

Mr. Walter Beer, who jointly proposed the scheme with Mr. Meik, was questioned by Sir John Wolfe Barry as to cost. The two main avenues from north to south and from east to west were twenty-four miles, and he allowed for forty-eight miles each of tramway and railways. The cost of land and buildings, after deducting recoupment and neglecting altogether tramways and railways, he estimated to be about 30 million pounds.

TREATMENT OF SEWAGE BY BACTERIA.

AT a meeting of the Yorkshire section of the Society of Chemical Industry, held at the Queen's Hotel, Leeds, on the 22nd inst., Mr. Jas. E. Bedford in the chair, Mr. W. J. Dibdin read a paper on this subject. Mr. Dibdin said in no other district had the bacterial treatment of sewage been more ably or enthusiastically taken up with the view to ascertaining the most economical and reliable means of applying this now generally recognised method of sewage purification than it had been in Leeds. The difficulty experienced with the ordinary coarse or "first contact" bed in those cases where the crude sewage was turned directly on to it was that the interstices between the particles of coke or clinker, etc., became filled with the finely divided matter in the sewage and carbonaceous residuum from the bacterial action on the organic matters. The grit or detritus tank and the septic tank left a quantity of sewage sludge to be disposed of. In discussing the question as to what could be done either to prevent the putrefactive action in the tank, whether "septic" or "grit," or to increase the efficiency of the coarse or first contact bed, he referred to the reports of the Manchester and Leeds Corporations, and he proceeded to say that in the case of a coarse bed filled with coke or clinker, etc., there were a number of solid particles presenting only an outer surface, the interior of the particles occupying space to no purpose. On consideration, it occurred to him that this interior space could be utilised by the employment of a material of hollow form, so that it would present an interior as well as an exterior surface on which the bacteria could grow. After trying tiles, he made an experiment at Devizes, in which waste slate débris was used. The slates were supported about one inch apart by small slate blocks. This arrangement gave no less than 80 per cent. of water capacity to the beds, thereby doubling their effective working capacity as compared with coke, etc. In fact, the bed at Devizes was exactly one-half the size of the fine bed into which it discharged, with the result that the cost of construction of an installation was reduced 50 per cent. By the use of slates the chief causes of loss of capacity were overcome. The growth of organisms would take place on both surfaces of the slates, and would not choke the spaces between, as in the case of coke, etc.

In the discussion which followed, Mr. Jones said that cases of the pollution of streams were constantly occurring in the North and East Ridings, and this pollution was not merely by manufacturers or individuals, but by local authorities, and was really disgraceful. When complaints were laid before the Local Government Board nothing was done. The worst of it was that the pollution was on the increase.

Dr. McLean Wilson stated that the most remarkable results in the way of treatment of sewage could now be seen at Knostrop. The sewage there came out bright and clean, and could do no harm in any river into which it might be turned. It was purified in about twenty minutes. Mr. Dibdin seemed to have got hold of a "good thing." His contact bed was one which presented the greatest extent of surface and held the greatest quantity of sewage, and he (Dr. Wilson) could not imagine any beds that would be more likely to fulfil these two conditions. At Knostrop were to be seen almost all kinds of bacterial and chemical treatment that had been suggested, and it was to be hoped that Col. Harding and his Committee would put in experimentally such a bed as Mr. Dibdin had suggested.

Dr. Evans remarked that an estate was on the point of being purchased by the Bradford Corporation, and before the new sewage works got into operation something like a quarter of a million would be spent. He failed to see that the people living on the banks of the Aire below Bradford would receive the amount of benefit that one ought to expect from the expenditure of so vast a sum of money.

Dr. Cameron stated that in Leeds they had been looking to the sprinkling system as the thing for the future rather than the contact beds, which had been tried with a greater amount of difficulty than the sprinkling form of treatment. The contact bed worked very well until it "struck." The second filter that was put down was still working well, but the first contact bed had had to be taken out and replaced. The question of cost was important, and Mr. Dibdin had sketched a mode of making his contact bed much cheaper and more efficient than it had hitherto been.

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Mr. Fairley referred to the facility of cleaning out the slate beds, and pointed out that this greatly reduced the cost as compared with clinker beds.

Mr. Dibdin, in replying, said there was no question that slate beds would give double the working capacity of slag or clinker beds. The slate contact bed would be found not only the most economical, but far and away the best means of destroying the foul mass of animal and vegetable matter called sludge. Slate, too, was inert, and formed an admirable home for the bacteria. He was glad to hear from Dr. Cameron that the original fine beds put up on his (Mr. Dibdin's) suggestion at Knostrop were working well. The original beds at Barking, Sutton, and elsewhere were also working well, and producing good effluents. When they got an effluent that did not undergo putrefaction and in which fish could live, it was good enough for all practical purposes.

GENERAL BUILDING NEWS.

CHURCH, BUXTON.—At Whaley Bridge on the 20th inst. the foundation-stone of a new church in the parish of Buxton was laid. The new church when completed will consist of nave, chancel, tower, and spire, and will seat 280 people. The estimated cost is 2,150*l*. Messrs. Currey and Thompson, of Derby, are the architects, Messrs. Fox and Goddard the builders, and Mr. E. Beard contractor for the joiner's work.

PARISH CHURCH, RADCLIFFE.—Radcliffe Parish Church was reopened on the 18th inst., after renovation. The alterations have been carried out under the supervision of Mr. R. B. Preston, architect, Manchester. The floor of the nave and the aisles has been lowered to its original level; the responds of the chancel arch, which had been so damaged as to have almost lost their original contour, were carefully restored; a bed of cement has been put over the whole area of the church; and on the south side of the chancel a portion of the floor has been made movable so as to allow of the inspection of the old bases of the chancel arch. The vestry has been extended and a wood block floor laid under the seats; the church has been reseated, and the chancel entirely refurnished in Dantzic oak, with pulpit, low screen, choir stalls, prayer desk, reredos, and panelling. Improvements have also been made in the heating and lighting.—*Manchester Guardian.*

CHAPEL, TAFF'S WELL, GLAMORGANSHIRE.—The Wesleyan Chapel at Taff's Well was opened recently after rebuilding, the cost of the work being 1,000*l*. The chapel will now seat about 800 people. Besides the new seating accommodation, a chancel has been provided. The architect was Mr. A. O. Evans (Pontypridd) and the builder Mr. E. Williams (Whitchurch).

MEMORIAL CHAPEL AND WINDOWS, ST. AGNES CHURCH, BRISTOL.—At St. Agnes Church on the 19th inst. the Archdeacon of Bristol dedicated the south chapel, the building, which has been erected in memory of Mr. Laurance Bruce Fyffe, of the Indian Civil Service, formerly the head of Clifton College. The memorial includes a carved oak screen set in three arches which divide the south chapel from the rest of the church, and a carved oak reredos. The altar-piece is an Arundel production of Perugino's picture of the "Adoration of the Cross." The altar stands on a step of marble mosaic. There were also dedicated by the Archdeacon two clearstory windows. One of the clearstory windows on the south side is the gift of Mr. Wood Bethell, the architect of the church.—*Western Daily Press.*

SCHOOLS, ATHERTON, LANCASHIRE. In connexion with this building, briefly described in our last issue, Messrs. Roger L. Lowe (Farnworth) ask us to add that the floors were laid with their patent Redwood Block flooring.

ST. MARGARET'S HOME, LONDON.—On the 13th inst., the Receiving Home for Children recently erected by the St. Pancras Board of Guardians, at a cost of some 13,500*l*., and known as St. Margaret's, was formally opened. The building, the erection of which was commenced some twelve months ago, is situated in the Leighton-road, Kentish Town, standing back about 175 ft. from the roadway. It is built of stock bricks with red brick arches and quoins; the floors are fire-resisting throughout, with wood block flooring to all rooms, other than the bathrooms and lavatories, which with the corridors, are laid with terrazzo. The building is lighted by electric light and gas throughout. It contains four floors, and provides accommodation for twenty boys, twenty girls, and twenty infants. There are six dormitories with ten beds in each, two isolation wards, and the usual dining and day-rooms. The administrative block is built for the need of eighty children, thus allowing for future extensions at the minimum of expense. The architect for the building was Mr. Albert E. Pridmore, London, and the general contractor Mr. C. Gray Hill, of London and Coventry. The principal sub-contractors were Mr. R. Clarke, for hot-water heating, and fire appliance; Messrs. John Finch and Co., for sanitary work and appliances; Messrs. Green and Co. (Sheffield), for cooking apparatus; Mr. Harold Downer (Watford), for electric lighting; The Brunswick Rock Asphalte Co. for asphalte; Messrs. Matthew T. Shaw and Co. for constructional steel work; Messrs. Carter and Aynsley, for brass work; and the Albion Iron Co. for stoves, etc.

THEATRE, HALIFAX.—It is proposed to replace the old Theatre Royal in Southgate, Halifax, with a new building. The new theatre will occupy the site of the present structure, including the old Shakespeare Hotel and other adjoining premises. The dress circle or principal floor will be five steps above the level of Southgate, and the principal entrances will be from that street. Messrs. Richard Horsfall and Son, of Halifax, are the architects.

WAREHOUSE, MACCLESFIELD.—The Royal Silk Warehouse, Macclesfield, has just been opened. The new building has a frontage to Walters Green of 100 ft., and is 50 ft. in depth. It has been built of pressed bricks, and the window sashes are divided by stone mullions, which are relieved and braced with stone courses. A tower surmounts the structure, and it is covered by a flat vulcanite roof. Mr. Jabez Wright was the architect, and the following were the contractors: Messrs. George Roylance, Ltd., builders; Messrs. Arighi, Bianchi, and Co. supplied the furniture and fittings, and Messrs. Harlow and Sons were responsible for the heating. The electricity works were carried out by Mr. R. Brown.

PREMISES, SOUTH-PLACE, FINSBURY, E.C.—Coventry House, as it is called, has been erected on the site of the old Metropolitan Hotel, and has frontages to South-place and South-street. The ground floor and basement will be devoted to the purposes of a restaurant. To the restaurant there is a separate entrance by a porch at the corner of South-place and South-street. A staircase will give access to the basement, where there is a kitchen, with serving-room, lifts, etc. The upper portion of the building is arranged in suites of offices, with a separate entrance in South-place. The hall, lined with oak, leads to a staircase, with an hydraulic passenger lift to all floors. The architects were Messrs. Davis and Emanuel, of Finsbury-circus.

BUSINESS PREMISES, BELFAST.—The business of Mr. John Cleland, known as the Clarence Printing Works, carried on for many years in Linenhall-street and Clarence-street, has been transferred to a new block of buildings erected at the corner of Great Victoria-street and Hope-street. The buildings have a frontage in Great Victoria-street of 60 ft. and a like frontage in Hope-street. The structure is five stories in height. The contract for the new building was carried out by Messrs. M'Laughlin and Harvey, Ltd., from the plans and under the superintendence of the architect, Mr. T. H. M'Caul. The following firms also had portions of the contract:—Plumbing and electric lighting, Messrs. Richard Patterson and Co.; gas-fitting, Messrs. James Louden and Co.; and power-hoist, Messrs. Robert Craig and Sons.

PUBLIC HALLS, GLASGOW.—Plans have been passed at the Glasgow Dean of Guild Court for the erection of a suite of public halls at the corner of South York-street and Govan-street. The new buildings will extend over half an acre of ground. The large hall, which will contain a gallery, will be 140 ft. long, by 60 ft. wide, and 45 ft. high, and will provide accommodation for 1,500 persons. Along either side of the hall are corridors, and, at the end of each, four stone staircases leading to the galleries. The principal entrance will be from South York-street, under a porch of granite pillars and pilasters, and through a vestibule to the crush hall, on each side of which are placed the retiring-rooms, cloak-rooms, etc. The three lesser halls, which are entered from Govan-street, will be able to seat from 200 to 600 respectively. Throughout the buildings will be lighted by electricity and heated by steam radiators, with air-extracting centrifugal electrical fans. The architects are Messrs. Bruce and Hay, Glasgow.

STAINED GLASS AND DECORATION.

WESTBURY-ON-TRYM, BRISTOL.—On Monday, February 22, a three-light window was dedicated in the Church of Westbury-on-Trym. The subject treated is "The Angel at the Tomb." It runs through the three lights without canopy work, and is an attempt at a naturalistic window. The moment chosen is the dawn; streaks of golden and greenish light cross a deep blue sky; Calvary and its crosses are silhoutted dark against light in the distance. In the foreground, the angel guards the tomb and addresses the women, while in the middle distance, three Apostles, just seen in the gloom, are entering the garden of Joseph of Arimathea. The work has been designed and executed by Messrs. Percy, Bacon, and Brothers, of London.

WINDOW, ILMINSTER CHURCH, SOMERSET.—A three-light window and tracery has been placed in this church. The subject is "The Nativity." The work has been carried out by Mr. H. A. Hymers, of Chelsea.

REREDOS, CHELTENHAM COLLEGE CHAPEL.—A large reredos, executed in stone, is in course of erection in the chapel at Cheltenham College, in memory of old Cheltenham pupils who fell in the South African war. It is designed by Messrs. Prothero and Phillott, architects, of Cheltenham, in the perpendicular style of Gothic. The reredos is 34 ft. wide and about 24 ft. high, and will contain fifty-six statues. Twenty-four of these are large statues, over 4 ft. high, representing great pioneers of the Church in England, from the early saints down to the later reformers, such as Raikes and Wesley. There are twenty-four smaller statues, representing pioneers of art, science, music, and literature, and eight smaller ones, again of four archangels and four patron saints. The work is being carried out by Messrs. Boulton, of Cheltenham, but we do not hear what artist is responsible for the execution of the statues; a matter of some interest, since sculpture can hardly be carried out by contract. The reredos is to be unveiled on April 6.

APPOINTMENTS.

UNIVERSITY OF LIVERPOOL CHAIR OF ARCHITECTURE.—At a meeting of the University Council on the 16th inst. Mr. C. H. Reilly was appointed to the Roscoe Chair of Architecture, left vacant by the resignation of Professor Simpson. Mr. Reilly, who is in his thirtieth year, was a scholar of Queen's College, Cambridge.

COUNTY ARCHITECT AND SURVEYOR FOR KENT.—At a meeting of the Kent County Council held on the 17th inst. the Committee appointed to select candidates for the office of County Surveyor presented its report, in which it was stated that 107 applications had been received when the lists were closed. Out of these eight candidates were selected for a personal interview with the Committee, and as a result the following three names were submitted to the Council for their final selection:—Mr. J. W. Horton, Deputy County Surveyor for Herts.; Mr. H. P. Maybury, Surveyor to the Malvern Urban District, and Mr. J. Slater, assistant County Surveyor for Lancashire. From these Mr. H. P. Maybury was elected unanimously. At the same meeting the Committee recommended the appointment of a County architect from April 1 next, and further recommended that Mr. Ruck should be offered this appointment. After some discussion Mr. Ruck was elected.

MONMOUTH.—At a meeting of the Monmouth Town Council recently, the appointment of a Borough Surveyor was again considered. The number of applicants, which at the last meeting had been reduced from forty-two to eleven, was now reduced to three, viz., Mr. F. R. Hybart (Barry), Mr. F. Thackeray (Darwen), and Mr. G. Grimwood (Birmingham). These gentlemen will be invited to attend the next meeting of the Council on March 7.

SANITARY AND ENGINEERING NEWS.

SEWERAGE AND SEWAGE DISPOSAL, SUTTON-IN ASHFIELD.—The Urban District Council have received the sanction of the Local Government Board to loans amounting to 22,550*l*. for the purposes of sewerage and sewage disposal in accordance with the scheme prepared by Messrs. Beesley, Son, and Nichols, of Westminster.

LOCAL SEWERS.—The Main Drainage Committee of the London County Council have sanctioned the construction of the undermentioned local sewers, subject to certain conditions recommended by the engineer:—Greenwich: 625 ft. of 9-in., 860 ft. of 12-in., and 30 ft. of 15-in. pipe and concrete sewers in proposed new roads on the Kidbrook-lodge estate between Kidbrook-grove and St. German's-place. Poplar: 830 ft. of 12-in. pipe and concrete sewers in Chapel House-street. Wandsworth: 150 ft. of 12-in. and (for surface water only) 570 ft. of 9-in. pipe and concrete sewers in proposed new road on the Eldon-house estate between Mitcham-road and Woodbury-street.

PUMPING STATION, CHELSEA.—On the 20th inst. Lord Monkswell, the Chairman of the London County Council, opened the new pumping station just completed at Lots-road, Chelsea. The pumping station has been erected to prevent flooding in low-lying districts, by pumping into the river the water which cannot flow there of itself by gravitation. The station is so placed that it commands both the northern low-level sewer, which runs from Hammersmith

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to Abbey Mills and drains an area of 24 square miles, and the Counter's Creek sewer, which rises near Kensal-green and drains the greater part of North Kensington, Hammersmith, Fulham, Walham-green, and Chelsea. For the low-level sewer there are four centrifugal pumps, each having suction and discharge branches 23 in. in diameter and capable of discharging 1,500 cubic ft. of water a minute. The Counter's Creek sewer pumps are also four in number, but their branches are 32 in. in diameter and each can deal with 3,000 cubic ft. of water a minute. The power required for each of the pumps of the two classes is not very different—210 i.h.p. for those of the low-level sewer and 260 i.h.p. for those of the other—the difference in the amount of water they can deal with being accounted for by the fact that in the case of the former the maximum lift is 28 ft. while in that of the latter it is only 14½ ft. Each pump is worked by rope drives from a separate two-cylinder gas engine, with which it forms a complete unit, independent in every respect. Gas engines were selected as being most economical in view of the necessarily intermittent character of the pumping. The total cost of the station has been about 82,000*l.*, of which the buildings (erected by the Works Department) accounted for about 50,000*l.*, the pumps by Messrs. Easton and Co. for about 6,100*l.*, and the engines by Messrs. Crossley Brothers for about 10,300*l.*

FOREIGN.

FRANCE.—M. Gabriel Ferrier is completing a series of decorative paintings for the church at Domrémy, representing incidents in the life of Jeanne Darc.——M. Chaplain has just completed a marble bust of Bertrand, the mathematician, intended for the Salle des Pas Perdus of the Institut.——The jury in the completion for new Halles and a Salle des Fêtes at Auray, have awarded the first prize to M. Ramonatxo, architect, of Pontivy. ——The Nord Railway Company are about to establish a new independent line from Paris to Compiègne, with eight stations en route. The estimated cost is 43 million francs. There is also talk of a new direct line to Biarritz, instead of obliging passengers to alight at the Gare de la Négresse.——M. Sainte-Anne Louzier has been elected President, for 1904, of the Union Syndicale des Architectes Français; M. Moreau is elected President of the Société des Architectes of the Yonne department; M. Carlier, President of the "Société Régionale du Midi de la France," and M. Platel, President of the Architectural Society of Hâvre.——Architects wishing to exhibit at the New Salon must send in their works on March 18 and 19. Associates have till March 20 to 29, and members send in on March 30 to 31.——A competition has been promoted, open to all French architects, for a Hôtel for the Société Amicale of former pupils of the Ecole des Mines, to be erected at St. Etienne.——A new hospital is to be built at Béziers, at an estimated cost of 2,800,000 francs.——The municipality of Arras are organising an art exhibition from May to October, limited to exhibitors belonging to the northern districts of France, and in which architecture will occupy an important place. ——M. José Frappa, a painter of talent, is dead, at the age of 50. He was a pupil of Pils, and had exhibited frequently since 1876. He was a member of the Société Nationale (New Salon), and has left a considerable number of works. Besides a certain number of portraits may be mentioned pictures entitled "Fête de san Eminence"; "Derniérs Moments de St. François d' Assisse;" "Pie VII. et Napoléon à Fontainebleau"; "La Tentation de St. Antoine"; etc.——The death is also announced, at the age of 44, of the sculptor André Hondain, a former pupil of Cavalier. He received a Mention in the Salon of 1887 for his Danaë, now in the museum at Rochefort, and obtained medals in those of 1889 and 1890, in the latter year for a statue of a Faun which excited much attention. The Galliera Museum possesses a group by him in stone, entitled "La Guerre." He was also the author of the monument erected at Melun to the memory of Pasteur. He exhibited at last year's Salon a statue of a young girl, which was much admired.

GERMANY.—A new State Theatre is to be built at Munich, as the old one would not be safe in case of panic.——An exhibition of the works of Gottfried Semper is to be held in the museum at Hamburg.——Herr Hermann Obrist has published a book entitled, "New Possibilities in Decorative Art," and essays ("Neue Möglichkeiten in der bildenden Kunst"), in which he denounces much of the modern German art, and urges the architects of his country to adopt a national style, and to throw off the academic restraints with which they seem to be burdened.——An important Industrial Exhibition is to be held at Magdeburg in August of this year.——The church of Hauterive in Freiburg is being restored under the direction of Professor Zemp and Herr Leo Chatelani; an examination of the building has brought to light some interesting frescoes that had hitherto been covered over.——The Park Restaurant at Mannheim, which was burnt down, is to be rebuilt according to the plans of Herr Karch. ——A new prison is to be built at Mannheim at a cost of 3,200,000 marks.——The building of the new Town Hall at Dresden has been placed in the hands of Herr Kräter and Herr Roth.——The Augustus bridge at Dresden, one of the oldest stone bridges in Germany, is to be destroyed. The bridge was built in the XIV. century, and it is to be regretted that it has been found necessary to replace it; but for years it has been unsafe, and has required constant repairs; moreover, the narrowness of the arches is a check on the increasing shipping traffic on the river Elbe. In connexion with the building of the new bridge, important alterations are to be made in the Theaterplatz.

AUSTRIA.—The group executed by the sculptor Josef Heu, which has been exhibited in Vienna, has been bought by the Town Council. It is called "The Releasing of the Spring" (Die Befreiung der Quelle) and represents two giants straining every muscle in their efforts to raise a boulder, from beneath which trickles a stream of water. The group is to be erected as a fountain in the Park at Vienna, a basin being constructed at its foot. ——A Nibelungen Memorial is to be erected on the banks of the Donau. The sculptor, Herr Seip, intends to represent Rüdiger, with his sword in his hand, as a symbol of loyalty and courage. The figure is to be of stone, but the sword and helmet are to be cast in green glass.——Important national schools have been built at Vienna under the management of the engineer Herr Josef Schacher; the building contains both a boys' and a girls' school and will accommodate 2,450 scholars.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —Mr. Edwin O. Sachs, architect, has removed his offices from No. 3 to No. 7, Waterloo-place, Pall Mall, S.W.

THE CONSISTORY COURT OF LONDON.—At a sitting of the Court in St. Paul's on February 12, Dr. Tristram, K.C., Chancellor of the Diocese, granted a faculty for some alterations and improvements of the parish church of St. Nicholas, Chiswick, so as to adapt the east end of the south aisle, which is now separated from the chancel by an open screen, for purposes of a morning chapel, with a second holy table and a reredos. The faculty embraces the sale of a painting of David, by Zoffany, which, since the demolition of the old church—the tower excepted—has been kept in the vestry. The church was rebuilt in 1882-4, after designs by J. L. Pearson, R.A. Dr. Tristram also granted a faculty for some structural alterations of the Church of Holy Trinity, Brompton, which will include the fitting of seats in a small west gallery and the painting of the walls in fresco. Holy Trinity Church was built, for 1,500 sittings, in 1826-9, after designs in the early English style, by Professor Donaldson. In 1860 the fabric was restored by Sir A. W. Blomfield.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on the 18th inst. at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz., building new churches at Grimsby, All Saints, Lincs., 125*l.*, and Reading, St. Mark, Berks, 170*l.*, and towards enlarging the churches at Downe, St. Mary the Virgin, near Farnborough, Kent, 5*l.*; Hither Green, St. Swithin, Lewisham, Kent, 50*l.*; and Newcastle-on-Tyne, St. Matthew, 40*l.* The following grants were also paid for works completed:—Greetham, All Saints, near Horncastle, Lincs., 45*l.*; Oystermouth, St. Peter, Glamorgan, 150*l.*; Wealdstone, Holy Trinity, Middlesex, 35*l.*; Willesden, St. Matthew, Middlesex, 20*l.* on account of a grant of 100*l.*; and Biggin Hill Mission Church, near Sevenoaks, Kent, 25*l.* In addition to this the sum of 150*l.* was paid towards the repairs of fifteen churches from Trust Funds held by the Society. The Committee announce that the Bishop of London, Vice-President of the Society, has consented to preside at the Annual General Court at the Church House on Thursday, May 19, at 3 p.m.

CAPE COLONY IMPORTS.—A statement of the imports into Cape Colony for the nine months ended September 30, 1903, has been published in the *Cape of Good Hope Government Gazette*. From this it appears that the imports of cement were valued at 112,000*l.*, as against 65,000*l.* in the corresponding nine months of 1902; of paints and colours at 124,000*l.*, as against 75,000*l.*; and of wood and manufactures of wood (including furniture and cabinet ware) at 1,636,000*l.*, as against 889,000*l.* Respecting the cement trade, the correspondent of the Board of Trade at Cape Town writes: "This article has been the subject of many experiments on the part of both shippers and importers before now, the competition being very keen. It is stated that one or two big Continental houses intend to adopt yet another change of tactics, by establishing their own depôts in the various coast ports, in each of which they would hold large stocks. Such a course, if decided upon, will take time before the scheme can be put in working order, a fact which will be appreciated by merchants who at present hold large quantities. The slackness in the building trade has caused a decrease in buying orders from builders, with the result that prices all round have dropped to a considerable extent. A good deal of the cement on hand has been forwarded on consignment, so that the losses sustained do not fall so directly on sellers, which may in some measure account for the present state of the market. Prices vary according to quality, ranging from 9s. 6d. to 13s."

NEW TECHNOLOGICAL DICTIONARY.—The universal technical dictionary for translation purposes, in English, German, and French, the compilation of which was begun in 1901 under the auspices of the Society of German Engineers, has received help up to the present time from 363 technical societies at home and abroad: fifty-one of these are English, American, South African, etc.; 274 German, Austrian, and German-Swiss; and thirty-eight French, Belgian, and French-Swiss societies. Of firms and individual collaborators, 2,573 have promised contributions. The excerption of texts in one, two, or three languages (handbooks, pamphlets, business letters, catalogues, price lists, etc.), and of the existing dictionaries, has yielded 1,920,000 word-cards so far. To these will be added within the next two years (by the middle of 1906) the hundred thousands of word-cards that will form the result of the original contributions—those already sent in and those still expected—of the 2,573 collaborators at home and abroad, when the editors in Berlin have finished them for the press. All the outstanding contributions will be called in by Easter of this year, 1904. The editor-in-chief is Dr. Hubert Jansen, Dorotheenstrasse 49, Berlin (N.W. 7).

MANCHESTER SOLDIERS' MEMORIAL.—A meeting of the Committee of the Manchester Soldiers' War Memorial Fund was held in the Town Hall recently, with the Lord Mayor in the chair. It is stated that Colonel Clapham moved and the Lord Mayor seconded a resolution that the Executive Committee should be requested to invite Messrs. H. Pegram, A.R.A., Alfred Drury, A.R.A., Hamo Thornycroft, R.A., G. J. Frampton, R.A., John Cassidy, and F. W. Pomeroy to furnish models or drawings of a memorial to be erected at a cost not exceeding 2,000*l.* (inclusive), and afterwards to submit to the General Committee the name of the sculptor whom they recommended should execute the commission. This was not carried, but, upon a ballot being taken, it was resolved that Mr. Thornycroft should be communicated with with a view to his undertaking the work.

WAR MEMORIAL, BEESTON, NOTTS.—A South African war memorial was recently unveiled at Beeston. The memorial stands on a site in Post Office-square and takes the form of a statue symbolical of Hope, standing 17 ft. in height. It has been executed in Portland stone from the designs of Mr. A. Marshall, architect, of Nottingham.

YORKSHIRE MASTER BUILDERS.—The Executive Council of the Yorkshire Federation of Building Trade Employers met in Bradford on the 18th inst., at the Café Royal. The attendance included delegates from Leeds, Huddersfield, Hull, Halifax, Barnsley, Wakefield, Scarborough, and York. The proceedings were private, but it is understood that the chief business was a discussion concerning ways and means of bringing about a closer union between masters and men in the building trade. Later in the afternoon the delegates, who numbered close upon sixty, paid a visit to Lister Park, and inspected the Cartwright Memorial Hall. Tea was afterwards partaken of at the Café Royal. The President (Mr. E. Good, of Hull) occupied the chair.

BOURNEMOUTH MASTER BUILDERS' ASSOCIATION.—The sixth annual dinner of the Bournemouth and District Master Builders' and Decorators' Association was held at the Hotel Metropole recently, the President (Mr. H. Harding) presiding. After the loyal and patriotic toasts had been honoured, "The Trade and Commerce of the Borough" was proposed by Mr. H. W. Woodall. He expressed himself as favourably disposed to an undercliff drive and the erection of a pavilion or kursaal, but with neither of these schemes must they only go half way. Mr. W. Hoare,

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J.P., replied. The position of Bournemouth to-day was not only due to the builders and architects, who had had their share in the development of the place, but it was also on account of the very strict sanitary arrangements that had been carried out. The sanitary arrangements had a good deal to do with the prosperity of a seaside resort. Now they had got the people, they must entertain them and keep up to date. The great thing they required was a pavilion. The Winter Gardens was a splendid thing, but the very time when their visitors wanted a place to meet in they were locked up for practices and rehearsals. The visitors had nowhere to go except the Arcade, and he did not think that was the place for a town like Bournemouth to have to welcome its visitors. They badly wanted a town hall. Mr. C. W. Keep proposed "The Mayor and Corporation," and the Mayor (Alderman J. E. Beale) responded. He agreed that the enterprise, energy, and ability of the builders and architects of the town had done a great deal to make Bournemouth. In order to get approximately their present position he had obtained figures. He found that in 1903 the rateable value of Bournemouth was 460,980*l.*, while to-day the rateable value amounted to 555,430*l.* The number of houses occupied in 1893 was 10,881, and to-day the total was 11,280. There were 180 empty houses in 1903, and to-day, notwithstanding the acknowledged depression which existed, the number was only 200. The number of houses in the borough in 1903 was 11,061, and to-day there were 11,480. Alderman Mate proposed "The Master Builders' and Decorators' Association," and said that building was undoubtedly the most important local industry, employing a larger number of workpeople than any other trade in the district. It was an organised trade, but organised in no spirit of hostility towards the workman. The Chairman and Mr. Hillier replied to the toast, the latter stating that the master builders and decorators of Bournemouth had banded themselves together for the benefit of employers and workmen and to promote good building. He did not think any of their members were shoddy builders, or jerry-builders as they were called, or that they would find any at all in Bournemouth. He regretted the absence of Councillor Minty, their secretary. The toast of "Kindred Associations" was proposed by Mr. J. W. Davis, and responded to by Mr. W. W. Evans (President of the Portsmouth Master Builders' Association) and Mr. H. Cawte (President Southampton Association). Mr. J. A. Nethercoate proposed the toast of the "Architectural Profession," and said that the pioneer architect of Bournemouth was the late Mr. Creeke. They had in Bournemouth to-day worthy gentlemen of the profession who prepared the best of designs, and he was sure they as builders did their utmost to carry those designs out in every detail. Mr. Thomas, in reply, said he thought the standard of work in Bournemouth had advanced very considerably during the last fifteen or twenty years. Mr. D. Drake proposed "The Visitors," Alderman J. C. Webber and Mr. J. Jones responding.

DISCHARGE OF HEATED WATER INTO A SEWER.—The Main Drainage Committee of the London County Council reported as follows at Tuesday's meeting of the Council:—"We have to report that, owing to the inconvenience caused by the continued discharge into the northern low-level sewer in Fulham Palace-road of water or other liquid of a very high temperature from the premises of the Hammersmith Distillery Company, steps were taken to ascertain the temperature of the liquid at the point of discharge between December 15, 1903, and January 15, 1904. During that period readings varying from 112 deg. F. up to 164 deg. F. were obtained on seventeen days, although the limit prescribed by section 9 of the Council's General Powers Act, 1894, is 110 deg. F. only. In view, therefore, of the fact that discharges of such high temperature as those recorded involved danger to the life and risk of injury to the health of persons entering the sewer, we directed the solicitor to take proceedings against the Company. Seventeen summonses were accordingly issued, and the case was heard on February 17, before Mr. Rose, at the West London Police Court, when the Company was fined 5*l.* and 10*l.* 10s. costs on the first summons, and 2*l.* and 2s. costs on each of fifteen other summonses, or 47*l.* in all. As regards the remaining day on which the temperature of the liquid discharged was over 110 deg. F., or two degrees only above the statutory limit, the summons was dismissed. We may add that the Company was convicted of similar offences on April 10, 1902, and February 18, 1903, when fines and costs amounting to 15*l.* 7s. and 40*l.* 6s. respectively were imposed."

RESTORING OLD YORK.—An interesting and quaint corner of York has just been restored through the public spirit and generosity of Mr. Frank Green, of the Treasurer's House. To make way for the new thoroughfare of Deangate, from Minster Yard to Goodramgate, some old houses in the latter street have been pulled down, leaving exposed the old archway from Goodramgate to College-street. This was one of the quaintest bits of the surviving old houses of York, and possessed special interest from the fact that it formed part of the premises in College-street occupied by George Hudson when the famous railway king was a linendraper. The archway and the shop to which it is attached have been purchased by Mr. Frank Green, who has had the archway restored, in half-timbered work, under the supervision of Mr. Temple Moore, the architect. The archway is supported on the southern side by oaken pillars, giving access to Deangate, while the open timber work of the story above the arch retains all the ancient features of the building. The excellence of the work will insure its preservation for many years.—*Yorkshire Post.*

CAPITAL AND LABOUR.

EMPLOYMENT IN JANUARY.—According to returns furnished by seventy-six employers' associations, whose members are estimated to employ about 89,000 workpeople, and by trade unions with an aggregate membership of about 185,000, employment with all branches but masons is bad, and shows no improvement as compared with a month ago; compared with a year ago it is worse. With masons employment on the whole is moderate, and shows no great change as compared with a month or a year ago. Employment with bricklayers is reported as dull generally, and rather worse than a year ago. With masons it is moderate in England and dull in Scotland. With carpenters and joiners, painters, plasterers, and slaters and tilers it is dull generally. The percentage of unemployed trade union carpenters and joiners at the end of January last was 7·7, compared with 7·9 at the end of December, and 6·5 at the end of January, 1903. Employment with plumbers continues dull generally. The percentage of unemployed trade union plumbers at the end of January was 9·3, compared with 7·7 at the end of December, and 6·4 at the end of January, 1903.—*Labour Gazette.*

Legal.

JARRAH TIMBER AND WOOD PAVING.

THE case of Samuel *v.* Bateman and the Jarrah Timber and Wood Paving Corporation, Ltd., came before Mr. Justice Bruce and a special jury in the King's Bench Division last week.

The plaintiff's case was that in the early part of 1901 he was approached by the defendant, Mr. Bateman, a director of the Jarrah Timber and Wood Paving Corporation, to advance a loan of 5,000*l.* to meet an overdraft and to enable the Company to pay preliminary expenses in connexion with a large area of virgin forest in Australia. Finally, plaintiff agreed to advance the 5,000*l.* at 6 per cent. per annum, and in consideration of doing so the plaintiff was given an option on 30,000*l.* of debentures at 60 per cent. discount, and that he should have all future underwriting operations at a commission of 10 per cent. The plaintiff said that at first he pressed for a commission of 2½ per cent. for the loan, but was induced to forego that, as Mr. Bateman told him the Company would not and could not afford to pay any commission. Plaintiff was afterwards repaid his 5,000*l.* It then came to the plaintiff's knowledge that the Company had paid Mr. Bateman commission for obtaining the loan from plaintiff, and 30*l.* for entertaining him during the negotiations. The plaintiff, therefore, claimed that he was entitled to the commission.

The defendant said that the money he received from the Corporation was by way of commission on various things he had done for the Company, and included director's fees. It certainly was not commission on the loan obtained from the plaintiff, although it appeared under the head of commission.

In the result the jury found in favour of the plaintiff, and judgment was entered for him for 100 guineas as against Mr. Bateman only.

Mr. Duke, K.C., and Mr. Nield appeared for the plaintiff, and Mr. Rawlinson, K.C., and Mr. Houston for the defendants.

A WISBECH ARCHITECT'S CLAIM.

IN this case, which was heard on Friday last week, at the Wisbech County Court, Mr. F. B. Ward, architect, sued Mrs. Harrison for 23*l.* 13s. 4d. for professional services.

The plaintiff's evidence showed that on April 2, 1903, he received a letter from the defendant, saying that she contemplated extensive alterations to a farmhouse at Hillside, Holbeach Hurn, and asking his terms. Plaintiff replied stating his terms, and had an interview with the defendant. Subsequently he went to the house and took the measurements. The work consisted of pulling about a very old house, and altering it, adding rooms, etc. After he had made the measurements, he received instructions to prepare the plans. Plaintiff saw defendant on March 16, and at that interview she propounded further proposals, and fresh plans had to be prepared. The defendant asked him if he could name the cost, and if it would cost 200*l.* He told her that he could not say that as the work was too intricate. Fresh plans were sent to Mrs. Harrison, who proceeded to invite tenders. On April 26 defendant changed her mind for the third time, and wrote again suggesting further alterations, and he again had to revise his plans. On May 5 she received two tenders, one for 354*l.* and one for 275*l.*, and complained of the amount, asking plaintiff if he could suggest any reductions. He, consequently, prepared fresh plans, for the fourth time, for carrying out those instructions. A second lot of tenders were then invited, and three were received, for 270*l.*, 212*l.*, and 186*l.*, by Mr. Yallup. The last tender was accepted, and the work was to be completed by June 20 under a penalty. On July 12 defendant asked plaintiff to take certain work out of the builder's hands, and on July 14 the builder was dismissed from the business, at the request of defendant. After that, defendant had the work completed by local builders, and she told plaintiff that she would not require his services any longer to supervise the work. In cross-examination the plaintiff denied that 200*l.* was named to him as the limit, but said 200*l.* was stated as the approximate sum. He did not say that he could prepare plans to carry out the work for 200*l.*, nor was he instructed to prepare his plans for 200*l.* He declined to say at the time that it could be done for 200*l.* Ultimately the jury returned a verdict for the plaintiff, one juror remarking that they would deduct nothing, and that they thought the plaintiff had done a great deal of work for his money.

[The foregoing is abridged from a report in the *Wisbech Standard.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

1,812 of 1903.—G. CHAMBERS: *Kitchener.*

The bottom rests upon a frame mounted on pivots and connected at the back with a rod passing underneath. By drawing the rod forward the bottom is raised and the ashes fall into the ashpan. The boiler is made with a flue at the top. The front of boiler is made sloping towards the back. The oven is provided with a shelf, which is drawn out on the opening of the oven door.

4,029 of 1903.—CLAUGHTONS, LTD., AND E. AUSTIN: *Hot Water Apparatus.*

This relates to a self-contained apparatus that will deliver water of any desired temperature from scalding hot down to cold, and that may be regulated to any temperature between those two extremes, and comprises a gas regulator that is operated by the change of water level from one point to another with consequent variation of pressure.

4,399 of 1903.—YATES, HAYWOOD, AND CO., LTD., AND S. HAYWOOD: *Cooking Ranges and other Fireplaces.*

This consists of an improved bottom grate having a segmental movement when its front edge is raised by means of a poker or other lever inserted into a hole prepared for it, or by other means. On each side of the grate near the back edge a disc is affixed, which may be varied in diameter and width according to the size and weight of the grate. Upon each side of the fireplace a semi-circular bearing is affixed to receive the disc upon the grate, which can be readily placed in position, and which when so placed will by gravity assume its lowest position. Side cheeks, or strong plates, are prepared to fit against each side of the range, and are shaped to fit upon the upper part of the discs before mentioned, and rise above the bearings. The weight of these cheeks and their frictional contact with the discs is sufficient to support and retain the grate, when in use, in any desired position. The invention further consists of a removable oven, which can be withdrawn from its normal position in the range without the usual difficulties which attend the removal of ordinary ovens, and to retain it in position a narrow flange or depending edge is prepared upon the back of the oven, which, when the oven is pushed back to position, engages with a recess and is thus prevented from being drawn out until it is raised.

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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4,656 of 1903.—A. CRAIG: *Rolled or Drawn Girder Section Beams and the like.*

A girder or similar beam consisting of a rolled or similar parallel girder in which the flanges have been caused to approach one another.

5,510 of 1903.—G. SMITH AND W. CRAIG: *Chimney Tops to Prevent Down Draught.*

Chimney tops for preventing down draught consisting in the provision of diamond-shaped bars and V-shaped bars therein, and in the attachment of the chimney top to chimney pot or can by means of lugs, or their equivalent.

5,612 of 1903.—J. GORDON: *Bolts for Fastening Doors, Windows, and Shutters.*

A bolt for fastening doors, windows, and shutters, having the stem of the bolt proper working in a slot in the barrel, which slot is made of a curved inclined shape near one or both ends so as to act upon the said stem and impart a turning movement to the bolt as it is being shot forward or withdrawn.

5,775 of 1903.—R. A. SAYER: *Means of Making and Fixing Ornamental Ceilings or Partitions.*

This consists in affixing raised or embossed ornamental materials to large sheets of millboard, compo-board, parquet boards, or the like previous to their being fixed to ceilings, walls, partitions, and the like.

5,928 of 1903.—E. TAYLOR: *Method of Attaching Door Knobs to Spindles.*

The use of a headless neck-screw made with projecting flat foot or flange fixed internally in a square spindle hole in a knob, comprising the combination with a split or divided spindle made with a countersunk hole at one end of each half spindle.

6,303 of 1903.—T. ROBERTS: *Windows.*

This relates to window sashes and frames so constructed that inlet and outlet currents of air can be obtained without creating draughts. In practice a window is provided with sashes one above the other in a frame, the sashes being hinged or pivoted at or near their lower ends whereby they may be opened towards the interior of the room. The sides of the said frame are at right angles to the inside faces of the sashes, and of sufficient depth or width to permit of the opening of the sashes for ventilating purposes, and so as thus not to permit of side draughts or currents of air to enter the room.

6,550 of 1903.—A. POSSEKEL: *Windows.*

This invention relates to windows, especially to such as are adapted to swing on horizontal axis, and has for its object to improve the construction of this class of windows, in such manner that the position on the horizontal axis upon which the window swings may be changed from a place distant from the window, and so that the lines of contact between the window frame and the window casing are hermetically closed by a special frame which is so arranged that it can be removed from and to the window and that, whilst it is opened and the window released, the horizontal axis cannot be changed.

6,930 of 1903.—P. MCCALLUM: *Siphons for Water-closet or like Cisterns.*

Siphons for water-closet and like cisterns consisting in the combination with an ordinary siphon of a branch formed with a valve seat, an elastic or other ball valve, and a weighted cylindrical vessel resting on same and sliding within an outer cylinder.

7,284 of 1903.—A. GHIGRY: *Device for Preventing Draughts and Introduction of Dust and Damp Beneath Doors.*

A device for preventing draughts, dust, and damp passing beneath doors, applicable to existing doors, characterised by a strip of wood arranged with felt, and disposed at the lowermost part of the door, being pushed downwardly when the latter is closed and bearing by its felt upon the floor, thus obturating the bottom of the said door, the device being returned to its initial position when the door is opened.

19,971 of 1903.—O. SMITH: *Permutation Locks.*

This relates to permutation locks, and consists of a device for adjusting the tumblers comprising one or more movable parts set in front of the locking mechanism and having teeth or projections adapted to be engaged by the finger, a casing enclosing said movable parts and having formed in it a falling notch or notches into which one or more of the teeth project and by means of which said teeth and the movable parts aforesaid can be moved by the finger through a predetermined distance and a series of impulses thus communicated to the tumblers.

27,286 of 1903. G. MEIDINGER: *Centrifugal Fans or Ventilators.*

Centrifugal fans or ventilators, consisting in the employment of a vane wheel provided with a limited number of main vanes, all or a part of which extend to the wheel boss, and at its outer periphery with a ring or crown comprising a large number of pallets or vanes which are narrow in the radial direction, straight or curved, and arranged radially or at an inclination with respect to the wheel radius.

28,086 of 1903.—F. R. STONE AND H. SIMKISS: *Construction of Opening Skylights.*

Skylights of the opening type, consisting in hinging the frame together by curling or turning over the top backs of the inner and outer frame so that the turn-over part or curl of the top back of the outer frame fits into, and is capable of turning in the turn-over part or curl of the top back of the inner frame; the top back of the outer frame being extended forward as one piece to meet the glazing bar.

28,143 of 1903.—J. J. GIBBONS: *Construction of Lock for Doors and the like.*

A lock so constructed that the key is prevented from being withdrawn except when the door, of which it is the fastening, is completely closed and the bolt subsequently shot into the staple.

23,404 of 1903.—L. MOUAT, JUN.: *Fastening Devices for Windows.*

A safety fastening device for windows consisting in the combination of a keeper secured to the meeting rail of the lower sash, having a hinged abutment holding surface at one side thereof, and a suitable stop at its opposite side edge, with a hooked arm pivoted to the upper sash, the end of which is designed to engage the abutment holding surface and keeper, when it is desired to lock both sashes closed, or to fasten to said keeper, when it is desired to open either sash a predetermined distance.

4,675 of 1903.—J. G. WHITE AND CO., LTD., AND J. H. FISHER: *Apparatus or Forms for use in the Construction of Conduits and Pockets or Boxes Specially Applicable as Containers for the Underground Conductors of Electric Traction Systems.*

Apparatus for use in casting conduits for the conductors of electric railways and tramways having underground current supply, said apparatus comprising a set of forms for shaping the walls of the conduits, which forms are made in sections adapted to fit together for casting the walls and to be removed separately through the slot of the slot rails after the walls are cast, and wedging devices for pressing apart the forms for shaping the walls of the conduits, said wedging devices being adapted to be contracted and drawn out of action by a hook or the like engaging in a loop on the wedging device and to be removed by being drawn along the conduit to a point at which insulator pockets are formed at the sides of the conduit, and through which pockets the wedging devices may be extracted after the side pieces of the forms have been removed through the slot of the slot rails.

6,966 of 1903.—H. J. NICKLIN: *Construction of Paving Block or Paving Slab.*

A composite paving block constructed of a number of wood pieces to form the wearing surface or tread, and a concrete or other similar base, the said base and pieces being in a suitable manner held to each other securely.

6,787 of 1903. G. T. MOORE: *Joint for Sewer Pipes and the like.*

A joint for sewer pipes and the like, consisting in forming a circumferential groove in the outer periphery of the spigot end and a similar groove in the inner side of the socket to form together an annular passage when the pipes are placed in position, with the spigot end of one in the socket end of the other; and an inlet opening communicating with the said passage for the reception of the liquid binding material; and yielding rings or gaskets led into the outer side of the spigot end.

7,166 of 1903.—T. CHARTERIS AND J. B. DUNN: *Construction of Flooring.*

Construction of flooring, consisting of a foundation of girders or concrete or a combination of both, blocks or slabs fitted therein or thereon, screw plugs engaging such blocks or slabs, steel bands stretched over such plugs, joists arranged across such steel bands and connected together by a cross piece, and floor boards secured to such joists.

27,365 of 1903.—C. J. ROY: *Scaffolds.*

A scaffold provided with an exterior portion having openings, a bar having openings and a threaded end and constructed to enter said exterior portion and having openings and a threaded end, devices to enter said openings to retain said parts in the desired relative position, a bracket slidably mounted on said scaffold and a threaded socket or base upon said projection, whereby the scaffold may be extended after adjustment and secured into the plate.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 9.—By DRIVER, JONAS, & CO., with CUMBERLAND & HOPKINS (at Leighton Buzzard).

Linslade, Bucks.—Southcott-rd., a freehold building estate, 2 a. 3 r. 19 p. £700
Leighton Buzzard, Beds.—"The Heath Farm," 65 a. 2 r. 24 p., f., y.r. 75*l.* 2,100

By FAREBROTHER, ELLIS, & CO. (at Doncaster).

Bawtry, Yorks.—Portions of the "Bawtry Hall Estate," comprising farms and lands, area about 110 acres; also houses, cottages, etc., f. (in numerous lots) 12,590
Market-pl., the "Crown Hotel," with two houses and shops adjoining, area ¾ of an acre, f. 3,425
Scrooby, Notts.—Impropriate tithes of 95*l.* .. 910

February 10.—By FAREBROTHER, ELLIS, & CO. (at Doncaster).

Austerfield, etc., Yorks. — Portions of the "Austerfield Estate," comprising farms and lands, area about 1,390 acres; also houses, cottages, etc., f. (in numerous lots) 20,130
Bawtry, Yorks.—Station-rd., the "Station Inn," area 2¼ acres 1,300

February 11.—By FAREBROTHER, ELLIS, & CO. (at Doncaster).

Fishlake, etc., Yorks. — "The Fishlake," "Sykehouse," and "Thorne" Estates, comprising farms and lands, area about 611 acres, f. (in numerous lots) 11,225

By BAXTER, PAYNE, & LEPPER (at Bromley).

Bromley, Kent.—26, 28, and 30, Pope-rd., f., p. 865

By NORMAN & SON (at Uxbridge).

Sipson, Middlesex.—"The Sipson Home Farm," also workshops, corn stores, etc., area 2 a. 3 r. 3 p., f. 3,000

February 12.—By FAREBROTHER, ELLIS, & CO. (at Doncaster).

Ferry Fryston, etc., Yorks.—Portions of the "Frys'on-pk." and "Pontefract" Estates, comprising farms and lands, area about 1,597 acres, f. (in numerous lots) 13,396
Thoralby, Yorks.—A rent charge of 50*l.* 12s. 7½d. 870
West Witton, Yorks. — Rent charges of 32*l.* 4s. 7½d. 530

February 13.—By STEPHENSON & ALEXANDER (at Cardiff).

Rumney, Monmouth. — "Newton Farm," 37 a. 3 r. 19 p., f., y.r. 84*l.* 2,365

February 15.—By THOMAS, PEYER, & MILES.

Llantwit Major, Glamorgan.—"The White Lion" Brewery and Hotel, with cattle yard and mart in rear, f., p. 2,500

February 16.—By DEBENHAM, TEWSON, & CO.

Peckham.—Moncrieff-st., l.g. rents 65*l.*, u.t. 69 yrs., g.r. nil 1,310
Moncrieff-st., l.g.r. 42*l.* 11s., u.t. 69 yrs., g.r. nil 830
Cicely-rd., etc., l.g.r. 18*l.* 10s., u.t. 69 yrs., g.r. nil 380
Cicely-rd., l.g.r. 39*l.*, u.t. 72 yrs., g.r. 21*l.* ... 340
Clayton-rd., l.g.r. 36*l.*, u.t. 72 yrs., g.r. 21*l.* 280
Hampstead.—78, 80, and 82, South Hill-pk., f., y.r. 195*l.* 2,830
Snaresbrook, New Wanstead. — "Woodland Cottage" and ½ an acre, c., y.r. 70*l.* 1,000

By DUNCAN & KIMPTON.

Hornsey.—81, Duckett-rd., u.t. 89½ yrs., g.r. 6*l.* 10s., e.r. 40*l.* 410
3, Waldegrave-rd., u.t. 75½ yrs., g.r. 6*l.*, y.r. 30*l.* 275

By MAY & ROWDEN.

New Bond-st.—No. 61 (s.), area 2,750 ft., Corporation lease, g.r. 5*l.* 4s. 6d., fine 36*l.* 10s. 8d. 20,250

By A. M. NEWCOMBE.

Cricklewood.—21, Prospect-rd., u.t. 75 yrs., g.r. 5*l.*, w.r. 28*l.* 12s. 180

By ROGERS, CHAPMAN, & THOMAS.

Clerkenwell.—11 and 12, Tysoe-st., y.r. 50*l.*; also l.g.r. 6*l.*, u.t. 11½ yrs., g.r. 1*l.* 10s. .. 295
Chelsea.—First-st., f.g.r. 49*l.* 10s., reversion in 40 yrs. 1,605
Hasker-st, f.g.r. 80*l.*, reversion in 40 yrs. .. 2,720
Milner-st., f.g.r. 22*l.*, reversion in 40 yrs. .. 750
Milner-st., f.g.r. 7*l.*, reversion in 27 yrs..... 305
Ovington-st., f.g.r. 36*l.*, reversion in 27 yrs. 1,385
Ovington-st, Peppercorn g.r., reversion in 41 yrs. 350
Hasker-st., etc., f.g.r. 4*l.* 5s., reversion in 47 yrs. 405
Milner-st., "The Australian" p.h., Peppercorn g.r., reversion in 41 yrs. 820
Milner-st., Peppercorn g.r., reversion in 41 yrs. 600
Green-st., Peppercorn g.r., reversion in 40 yrs. 500

By FAREBROTHER, ELLIS, & CO. (at Sheffield).

Great Houghton, Yorks.—"The Great Houghton Estate," comprising farms and lands, area 278 acres f. (in nine lots) 8,555
"The Old Hall Inn" and 11¼ acres, f., y.r. 53*l.* 3,500
Penistone, Yorks.—"Bull House Hall" and Colliery, surface area 149 a. 1 r. 10 p., f.. 5,500
"Bull House Mill and Farm," 45 a. 3 r. 29 p., f. 1,820
Bullace Grange Farm," 33 a. 0 r. 19 p., f. .. 2,150
Freehold land, with cottage, etc., 13 a. 2 r. 20 p. 700
"A Shaw Farm," 232 acres, f. 2,000
Tapton, Derby.—"The Tapton Estate," 31 acres, f. (in five lots) 1,180

February 17.—By FOSTER & CRANFIELD.

St. James's.—22, Ryder-st. ("St. James's Palace-chambers"), u.t. 54½ yrs., g.r. 1,121*l.*, y.r. 4,092*l.* 13,000
Stratford.—98, 100, 102, and 104, Maryland-sq., u.t. 84 yrs., g.r. 2*l.*, y.r. 104*l.* 1,030
Battersea.—Ingrave-st., l.g.r. 117*l.* 5s., u.t. 46 yrs., g.r. nil 2,110

By HAMPTON & SONS.

South Kensington.—8, Bolton-gdns., u.t. 57½ yrs., g.r. nil, y.r. 200*l.* 2,800

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By MANSELL & ROWE.

Norwood.—6 and 8, Belvedere-rd. (s.), u.t. 48½ yrs., g.r. 16*l.*, y.r. 90*l.* £505
12 and 14, Belvedere-rd., u.t. 47½ yrs., g.r. 12*l.* 10s., y.r. 90*l.* 530

February 18.—By ALLAN BOOTH.

Holloway.—106, Carleton-rd., u.t. 51¼ yrs., g.r. 10*l.*, e.r. 75*l.* 750
31, Beacon-hill, u.t. 38¼ yrs., g.r. 8*l.* 8s., e.r. 65*l.* 630

By MIDDLETON & CRACKNELL.

Hampstead.—8a, Heath-st., and 1a to 5a, Perrin's-ct. (shops and flats), u.t. 62½ yrs., g.r. 50*l.*, y.r. 228*l.* 4s. 1,050

By G. TROLLOPE & SONS.

Covent Garden.—Garrick-st., f.g.r. 25*l.*, reversion in 39 yrs. 1,020

By FRED VARLEY & SON.

Kingsland.—41, Ware-st. (mission hall, etc.), u.t. 29 yrs., g.r. 6*l.*, y.r. 47*l.* 295
Finsbury Park.—22, Portland-rd., u.t. 55 yrs., g.r. 12*l.* 12s., y.r. 60*l.* 550
88, Wilberforce-rd., u.t. 63 yrs., g.r. 8*l.*, e.r. 50*l.* 445
Crouch End.—106, Crouch-hill, u.t. 64¼ yrs., g.r., etc., 11*l.* 10s. e.r. 70*l.* 450

By H. J. BLISS & SONS.

Kennington.—52, Hanover-gdns., u.t. 41 yrs., g.r. 6*l.*, w.r. 41*l.* 12s. 225
Bethnal Green.—112, Green-st. (s.), u.t. 15½ yrs., g.r. 5*l.* 3s., y.r. 40*l.* 130
52 to 60 (even), Chisenhale-rd., f., w.r. 200*l.* 4s. 2,480
Bow.—44, Eglinton-rd., f., w.r. 31*l.* 4s. 455
10 and 12, Chadd-st., f., w.r. 62*l.* 8s. 560

By NEWBON, EDWARDS, & SHEPHARD.

Balham.—30, Oldridge-rd. (s.), f., y.r. 20*l.* .. 450
56, Bellamy-st., f., y.r. 28*l.* 390
Canonbury.—27, Alma-rd, f., y.r. 40*l.* 650
Holloway.—140 and 142, St. James's-rd. (s.), f., y.r. 84*l.* 1,205
44, 48, and 50, Victoria-rd., f., y.r. 96*l.* 1,155
37 and 39, Victoria-rd., f., y.r. 58*l.* 685
Hoxton.—60 and 61, Napier-st., u.t. 30 yrs., g.r. 28*l.*, y.r. 68*l.* 285
Regent's Park.—35, Munster-sq., and 26, Little Albany-st., u.t. 18½ yrs., g.r. 9*l.* 9s., y.r. 56*l.* 405
King's Cross.—98 and 100, Southampton-st., y.r. 72*l.*, also l.g.r. 7*l.* 5s., u.t. 20½ yrs., g.r. 17*l.* 10s. 405
Stoke Newington.—5, Lancell-st., u.t. 70½ yrs., g.r. 6*l.* 6s., y.r. 35*l.* 340
Bromley-by-Bow.—46 and 48, Byron-st., f., w.r. 57*l.* 4s. 590
Stratford.—66 and 68, Major-rd. (s.), f., w.r. 59*l.* 16s. 470
Forest Gate.—80, 82, and 84, Huddlestone-rd., f., y.r. 92*l.* 1,010

February 19.—By A. J. SHEFFIELD.

Whitechapel.—Old Montague-st., f.g.r. 98*l.*, reversion in 86 years 2,275
Upper East Smithfield.—No. 19 (s.), e.r. 41*l.* 12s. 270

Contractions used in *these lists*.—F.g.r. for freehold ground-rent; l.g.r or leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, FEBRUARY 26.

Royal Institution.—Mr. Alexander Siemens on "New Developments in Electric Railways." 9 p.m.
Institution of Civil Engineers (Students' Meeting).—Mr. L. G. Crawford on "Boiler-House Design." 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Dr. A. Wellesley Harris on "Methods of Disinfection." 7 p.m.
Glasgow Architectural Craftsmen's Society.—Mr. Colin Sinclair on "Floor Paving: Wood, Granolithic, Asphalte." 8 p.m.

SATURDAY, FEBRUARY 27.

Royal Institution.—Right Hon. Lord Rayleigh on "The Life and Work of Stokes," II. 3 p.m.
Sanitary Institute (Demonstration for Sanitary Officers).—Inspection at Tottenham Disinfecting Station and Dust Destructor. 3 p.m.
Builders' Foremen and Clerks of Works' Institution.—Annual Dinner, King's Hall, Holborn Restaurant. 6 p.m.

MONDAY, FEBRUARY 29.

Royal Institute of British Architects.—Special General Meeting and General Business Meeting. (See p. 221 for particulars.) 8 p.m.
Royal Academy.—Professor Aitchison, R.A., on "Vitruvius," I.
Society of Arts (Cantor Lectures).—Mr. C. T. Jacobi on "Modern Book Printing," II. 8 p.m.
Regent-street Polytechnic (University Extension Lectures).—Professor Vivian Lewes on "The Chemistry of Air, Fire, and Water," V. 8 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Dr. A. Wellesley Harris on "Elementary Statistics." 7 p.m.
Builders' Benevolent Institution.—Committee Meeting. 5 p.m.

TUESDAY, MARCH 1.

Institution of Civil Engineers.—Papers to be further discussed:—(1) "The Construction of Railway Waggons in Steel," by Mr. J. D. Twinberrow; (2) "The Construction of Iron and Steel Railway Waggons," by Mr. A. L. Shackleford; and (3) "Iron and Steel Railway Waggons of High Capacity," by Mr. J. T. Jepson. 8 p.m.
Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Mr. N. W. Hoskins on "The Atmosphere and Meteorology." 7 p.m.
Institute of Builders.—Special Finance Committee Meeting. 2.30 p.m. Council Meeting. 3 p.m.

WEDNESDAY, MARCH 2.

Institution of Civil Engineers.—Students' Visit to Inspect the New Stores and Plant for Handling Grain at the Millwall Docks. 2.30 p.m.
Institute of Sanitary Engineers, Ltd.—Mr. Chilvers on "Water-closets in General." 7 p.m.
Sanitary Institute (Lectures and Demonstrations) for Sanitary Officers).—(1) Inspection at London County Council Common Lodging-house, Parker-street, Drury-lane. 3 p.m. (2) Mr. W. C. Tyndale on "Water: Composition, Pollution, and Purification." 7 p.m.
Edinburgh Architectural Association.—Mr. J. S. Morton on "Scotch Woodwork." 8 p.m.

THURSDAY, MARCH 3.

Royal Academy.—Professor Aitchison on "Vitruvius," II.
Royal Institution.—Professor H. L. Callendar, M.A., F.R.S., on "Electrical Methods of Measuring Temperature," II. 5 p.m.
Carpenters' Hall, London-wall (Free Lectures on Matters Connected with Building).—Mr. C. R. Ashbee, M.A., on "The Workmen of the Middle Ages." 8 p.m.
Society of Ordained Surveyors, Edinburgh (117, George-street).—Mr. J. L. Wark on "Mutual Gables." 8 p.m.
London Master Builders' Association.—Special Finance Committee Meeting. 4 p.m.

FRIDAY, MARCH 4.

Architectural Association.—(1) Special Meeting to consider whether the day of the Ordinary Meeting shall be changed. (2) Mr. J. W. Simpson on "Schools." 7 p.m.
Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "Calculations, Measurements, and Plans and Sections." 7 p.m.
Junior Institution of Engineers (Westminster Palace Hotel).—Paper by Mr. G. C. Allingham entitled "Some Practical Notes on Electric Storage Batteries." 8 p.m.

SATURDAY, MARCH 5.

Royal Institution.—Right Hon. Lord Rayleigh on "The Life of Stokes," III. 3 p.m.
Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage Works Sutton, Surrey. 3 p.m.
Institute of Sanitary Engineers, Limited.—Visit to the Richmond Main Sewage Works (Mr. W. Fairley, engineer).
British Institute of Certified Carpenters.—Discussion on "Failures in Carpentry and Joinery." 6 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks ...	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" at railway depôt.
Red wire Cuts ..	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire ..	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers..	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamfered, Squints .	20 0 0	" " "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers..	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamfered, Squints..	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.
	s. d.	
Thames and Pit Sand.....	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	29 0	per ton, "
Best Ground Blue Lias Lime	20 6	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fire Clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington depôt.....	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms depôt	1 8½	" "

STONE—(*continued*)—

	s. d.	
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf ..	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf ..	2 2½	" "
	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer in blocks	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks ..	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "
YORK STONE—*Robin Hood Quality.*		
	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
" " " 6 in. sawn both sides landings	2 7	deld. rly. depôt; per ft. super. deld. rly. depot.
" " " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 x 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 x 12 "	13 17 6	" "
20 x 10 best seconds "	12 15 0	" "
20 x 12 " " "	13 10 0	" "
16 x 8 " " "	7 0 0	"
20 x 10 best blue Portmadoc	12 12 6	" "
16 x 8 best blue Portmadoc	6 12 6	" "
20 x 10 best Eureka unfading green ..	15 2 6	" "
20 x 12 best Eureka unfading green ..	17 2 6	" "
18 x 10 " "	12 10 0	" "
16 x 8 " "	10 5 0	" "
20 x 10 permanent green	11 10 0	" "
18 x 10 " "	9 10 0	" "
16 x 8 " "	6 10 0	" "

TILES.

	s. d.	
Best plain red roofing tiles..	42 0	per 1000 at rly. depot
Hip and Valley tiles ..	3 7	per doz. " "
Best Broseley tiles.....	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " "
Hip and Valley tiles ..	4 0	per doz. " "
Best Ruabon red, brown or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 " "
Do. Ornamental do.	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000 " "
Do. pressed	47 6	" " "
Do. ornamental, do.	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles.....	3 6	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	15 10 0	16 10 0
Deals: best 3 by 9.....	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 3 in., and 3 in. by 7 in. and 3 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in by 6 in...	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in...	8 10 0	9 10 0
Foreign Sawn Boards—		
1 in. and 1½ in. by 7 in.....	0 10 0	more than battens.
⅞ in.....	1 0 0	"
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)....	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)..	3 5 0	3 15 0
JOINERS' WOOD.		
White Sea: first yellow deals, 3 in. by 11 in.....	At per standard. 23 0 0	24 0 0
3 in. by 9 in.....	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.....	18 10 0	20 0 0
" 3 in by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.....	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0

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JOINERS' WOOD.—(*Contd.*)

	At per standard. £ s. d.	£ s. d.
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in..	14 10 0	15 10 0
" " 3 in. by 9 in..	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	25 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Dantzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
½ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ..	7 5 0
Compound Girders, ordinary sections	8 2 6 ..	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ..	8 17 6
Fitch Plates	8 5 0 ..	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ..	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 5 0 ..	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0 ..	8 5 0
Staffordshire "Marked Bars"	10 0 0 ..	—
Mild Steel Bars	8 15 0 ..	9 5 0
Hoop Iron, basis price	9 5 0 ..	9 10 0
" " galvanised	17 10 0 ..	—

(*And upwards, according to size and gauge.)

Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ..	—
" " 24 g.	10 15 0 ..	—
" " 26 g.	12 5 0 ..	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 8 ft. to 20 g.	12 15 0 ..	—
Ordinary sizes to 22 g. and 24 g	13 5 0 ..	—
" " 26 g.	14 5 0 ..	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ..	—
" " 22 g. and 24 g.	16 10 0 ..	—
" " 26 g.	18 0 0 ..	—
Galvanised Corrugated Sheets—		
Ordinary sizes, 6 ft. to 8 ft. 20 g	12 10 0 ..	—
" " 22 g. and 24 g.	13 0 0 ..	—
" " 26 g.	13 15 0 ..	—
Best Soft Steel Sheets, 6ft. by 2ft. to 8 ft. by 20 g. and thicker..	11 15 0 ..	—
Best Soft Steel Sheets, 22 g. & 24 g	12 15 0 ..	—
" " " 26 g	14 0 0 ..	—
Cut nails, 3 in. to 6 in.	9 0 0 ..	9 10 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 5 0 ..	—
Pipe in coils	14 15 0 ..	—
Soil pipe	17 5 0 ..	—
Compo pipe	17 5 0 ..	—
ZINC—Sheet—		
Vieille Montagne ton	26 5 0 ..	—
Silesian	26 0 0 ..	—
COPPER—		
Strong Sheet per lb.	0 0 10½ ..	—
Thin "	0 0 11½ ..	—
Copper nails "	0 0 11 ..	—
BRASS—		
Strong Sheet per lb.	0 0 10 ..	—
Thin "	0 0 11 ..	—
TIN—English Ingots "	0 1 4 ..	—
SOLDER—Plumbers' "	0 0 6½ ..	—
Tinmen's "	0 0 8 ..	—
Plowpipe "	0 0 9 ..	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft.	delivered.
" fourths	1¼d. "	"
21 oz. thirds	3d. "	"
" fourths	2¼d. "	"
26 oz. thirds	3¼d. "	"
" fourths	3d. "	"
32 oz. thirds	4¼d. "	"
" fourths	4d. "	"
Fluted sheet, 15 oz.	2¼d. "	"
" 21 oz.	3¼d. "	"
¼ Hartley's Rolled Plate	1¼d. "	"
½ " " "	1½d. "	"
¾ " " "	2¼d. "	"

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes or barrels.. per gallon	0 1 8
" " in drums "	0 1 11
Boiled " in pipes or barrels.. "	0 1 11
" " in drums "	0 2 2
Turpentine, in barrels "	0 3 10
" in drums "	0 4 0
Genuine Ground English White Lead per ton	19 0 0
Red Lead, Dry "	19 0 0
Best Linseed Oil Putty per cwt.	0 7 6
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

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TO CORRESPONDENTS.

W. B. S. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BENWELL.—For the erection of a greenhouse in Hodgkin-park, for the Benwell and Fenham Urban District Council. Mr. W. P. Pattison, Surveyor, Council Offices, Benwell:—

Greenhouse Plant, Staging, and Heating Apparatus.

W. Richardson & Co., Darlington £111 2 6

Boiler House and Walls.

T. Hutchinson, Elswick-road, Newcastle-on-Tyne 67 17 0

BOSTON (Lincolnshire).—For the erection of a science school at the Grammar School, for the Governing Body. Mr. Jas. Rowell, architect, Market-place, Boston:—

H. W. Parker & Son, Boston* £1,218

BRIDLINGTON. — For erecting four ornamental kiosks, building dwarf wall, fixing iron palisading, etc., upon land in South Cliff-road, for the Property Committee of the Corporation. Mr. E. R. Matthews, C.E., Borough Surveyor, Town Hall:—

Kiosks.

G. Day	£488 15 0	E. Corner	£357 0 0
J. H. Hudson	475 8 0	J. Rennard	340 0 0
G. Grainger	419 13 0	T. Spink	325 0 0
A. A. Booth	439 0 0	J. R. Stork	318 0 0
W. Moody	388 0 0	G. Storr & Son, King-street*	310 0 0
W. Barnes	359 19 0		
E. E. Yeomans	359 0 0		

: Withdrawn.

Dwarf Wall.

E. Corner	£135 10 0	J. Rennard	£97 6 3
C. Limon	109 0 0	J. Sawdon, Centre House, Quay-rd.*	86 0 0
W. Barnes	98 0 0		

Palisading.

Clarkson & Co.	£216 0 0	G. W. Fenly & Son	£138 17 0
R. Bailey & Son	185 0 0	C. Limon, Lincoln-terrace*	136 0 0
J. Rennard	145 0 0		
E. H. Dale	142 10 0		

BRIGHTON.—For ten double tenement dwellings, for the County Borough:—

Box & Turner	£6,313	Sattin & Evershed	£4,890
H. J. Penfold	5,797	J. & W. Simmonds, Ashford-road, Brighton*	4,575
Jas. Barnes	5,640		
R. Cook & Sons	5,600		
Wm. Taylor	5,567	H. A. Caxton & Jay	3,990

BRIGHTON.—For eight shops and houses on the Spa-street area, for the County Borough:—

Box & Turner	£7,720	J. & W. Simmonds	£6,152
J. Barnes	7,120	Sattin & Evershed, Freshfield-road, Brighton*	5,955
H. J. Penfold	6,897		
R. Cook & Sons	6,800		
Wm. Taylor	6,786		

CHINGFORD.—For making-up, paving, kerbing, etc., Buxton-road, Frederica-road, and Willow-street, for the Urban District Council. Mr. W. Stair, Surveyor, 14, The Parade, Chingford:—

P. Watson, jun.	£3,795 1 2	Victoria Stone Co.	£2,758 0 0
J. Summerfield	3,565 4 4	M. S. Kitering-ham	2,726 8 0
Free & Sons	3,385 0 0	T. Adams	2,720 0 0
Parsons & Parsons	2,942 11 6	W. & C. French, Buckhurst Hill*	2,612 0 0
Harvey Bros.	2,864 0 0		
Griffiths & Co., Ltd.	2,800 0 0		

CROYDON.—For making up the following roads:—Bronson, Dorien, Dupont, and Sydney, in the parish of Merton, for the Croydon Rural District Council. Mr. R. M. Chart, Surveyor, Town Hall, Croydon:—

Harvey Bros.	£3,464	Free & Sons	£3,124
T. Adams	3,350	E. Iles, Mitcham*	3,011

EAST RETFORD.—Accepted for the supply of granite and slag, for the Rural District Council. Mr. T. Henry, Surveyor, Retford:—

Charnwood Granite Co., near Loughborough
Summerson & Co., Cockfield
Ord & Maddison, Darlington
Sommerfeild & Mead, Hull
Groby Granite Co., Leicester
Mount Sorrel Granite Co., near Loughborough
Ellis & Everard, Bardon Hill
F. T. Lazenby, Retford
W. Prestwich, Dronfield
Stanton Ironworks Co., Nottingham
Butterley Iron Co., Derby

} At a schedule of prices.

EBBW VALE (Mon.).—For the erection of five houses and shop, Cwm, for Mr. J. Harrison. Mr. E. N. Johnson, architect, Risca, Mon.:—

Lattey & Co., Ltd.	£2,647 13 2	C. F. Reed	£2,322 0 0
John Charles	2,570 0 0	Williams & Rogers, Cwm*	1,994 15 0

ERITH.—For extension to main switchboard and cable connexions, for the Urban District Council. Messrs. Hawtayne & Zeden, engineers:—

General Electric Co., Ltd., Witton, Birmingham* £449

ERITH.—For three-phase alternator and direct-coupled high-speed enclosed-type steam engine of 500 k.w. capacity, for the Urban District Council. Messrs. Hawtayne & Zeden, engineers:—

British Westinghouse Electrical and Manufacturing Co., Ltd. (Westinghouse-Belliss combination). Trafford Park, Manchester* £3,240

ERITH.—For surface condenser, with steam-driven air and circulating pumps, for the Urban District Council. Messrs. Hawtayne & Zeden, engineers:—

Blake & Knowles Steam Pump Works, 179, Queen Victoria-street, E.C.* £472

ERITH.—For steam, exhaust, feed, air, and circulating, blow-off, and drain pipes, for the Urban District Council. Messrs. Hawtayne & Zeden, engineers:—

Sir Hiram Maxim Electrical and Engineering Co., Ltd., Westminster, S.W.* £806

ERITH (Kent).—For two Lancashire boilers, with fittings, brickwork settings, and steam feed pump, for the Urban District Council. Messrs. Hawtayne & Zeden, engineers, 9, Queen-street-place, London:—

Yates & Thom, engineers, Blackburn £2,285

FARMFIELD.—For two contact beds, sump tank, and small machinery house, etc., in connexion with sewage disposal works, at Farmfield Reformatory, for the London County Council:—

J. Cracknell	£692	Haslemere Builders	£536
R. Wallace	636	Foster Brothers	510
S. Redhouse, sen.	625	R. Cook & Sons, Crawley*	446
Potter Bros.	548		

[The architect's estimate comparable with these tenders amounts to £630.]

GRIMSBY.—For the erection of a store, Fish Docks, Grimsby, for the United Steam Fishing Co., Ltd. Mr. E. Goodhand, architect, Osborne-chambers, Grimsby:—

Gilbert & Kirton	£503 10 0	J. H. Thompson & Sons	£477 0 0
G. Cook	492 16 9	G. & J. Smith	464 0 0
Hewins & Goodhand	489 0 0	J. Markham, 87, Cromwell-rd.*	425 15 0
W. Ion	480 0 0		

[All of Grimsby.]

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HURST.—For roadworks and conversion of closets to water carriage system, King-street, Hurst, near Ashton, for the Hurst Urban District Council. Mr. S. Shirt, Surveyor, Council Offices, King-street, Hurst :—
E. Marshall & Sons, Cricket's-lane, Ashton-under-Lyne £114 3 0

HURST.—For sewering and gullying Halifax-street and Elizabeth-street, Hurst, near Ashton-under-Lyne, for the Urban District Council. Mr. S. Shirt, Surveyor, Council Offices, King-street, Hurst :—
C. & J. Matley, Russell-street, Ashton-under-Lyne £126 18 0

KENDAL.—For 1,134 yards lineal of surface water sewers, for the Corporation. Mr. R. Hampton Clucas, C.E. :—

F. Millward & Co.	£378 8 10	W. Barrick	£297 14 0
W. Canadice	342 0 0	J. Burn	263 10 6
R. Woodburn	317 0 0	T. & W. Dicken, Kendal*	240 11 0

KILDARE.—For the erection of an hotel, for Miss E. Talbot. Mr. F. Bergin, architect, 36, Westmoreland-street, Dublin :—

Lynch & Egan	£3,450 0 0	Jas. Donovan	£3,200 0 0
Mackey & Son	3,434 0 0	Patrick Hanway	3,150 0 0
Payne Bros.	3,411 12 5	Peter Byrne	2,960 0 0
James P. Pile	3,350 0 0	John Reid, Malahide*	2,700 0 0
D. & G. Carbery	3,305 0 0		
J. Pemberton & Son	3,240 0 0		

LEYTON.—For the supply of road materials, for the Leyton Urban District Council. Mr. W. Dawson, M.Inst.C.E., Town Hall, Leyton :—
W. Manders, Leyton : Indurated stone, 5½d. per ft. super. ; laying stone paving, 10d. per yd. super.
Adamant Stone and Paving Co., Ltd., Palace-chambers, Westminster : Adamant stone, 6d. per ft. super.
L. Sommerfeld, 2, Fowkes-buildings, Great Tower-street, E.C. : Guernsey granite from the Crown Quarries, Alderney, Port of Guernsey, 2 in. 12s. 10d., 1½ in. 13s. 6d. per ton (1,000 tons) ; Guernsey granite chippings, 9s. 3d. per ton.
W. G. Harris, 41, Albert-road, Stratford : Hard core, 2s. 6d. per cubic yard ; flints, 6s. 10d. per cubic yard (3,000 yards chalk flint, balance pit ditto) ; Thames ballast, 5s. 6d. per cubic yard ; Thames sand, 7s. 6d. per cubic yard.
W. Griffiths & Co., Ltd., Hamilton-house, Bishopsgate-street, E.C. : Guernsey granite, 2 in. 13s. 7d., 1½ in. 14s. 1d. per ton (5,000 tons) ; Guernsey granite chippings, 10s. per ton ; Norway pitchers, 5 in. by 7 in. 35s. 6d., 4 in. by 6in. 31s., 4 in. by 4 in. 36s. per ton ; kerb, 12 in. by 8 in., 1s. 5d. per ft. run.

LONDON.—For five detached houses in Dollis-avenue, Finchley, N. Messrs. Bennett & Richardson, architects, Finchley, N. :—
J. Phœnix* £6,000

LONDON.—For residence for Mr. W. Fowler, on Wills'-road, Mill Hill, N.W. Messrs. Bennett & Richardson, architects and surveyors, 2, Broadway, Finchley, N. Quantities by the architects :—

Mattock Bros.	£2,290	J. Bentley	£2,126
F. Gough & Co.	2,154	W. Tout	2,090
G. Godson & Sons.	2,150	J. Phœnix	2,090

LONDON.—For conversion of villas into shop (Bon Marche), Finchley, N., for Messrs. Boyce. Messrs. Bennett & Richardson, architects and surveyors, 2, Broadway, Finchley, N. :—

C. Plowman, Ltd.	£575 0	T. Cooper	573 0
G. Clarke	£573 10	Shewery & Sons*	560 0

Shop front, £225.

LONDON.—For residence, Freston Tower, Hendon-avenue, Finchley, N., for Mr. Jesse Hawes. Messrs. Bennett & Richardson, architects and surveyors, 2, Broadway, Finchley, N. Quantities by the architects :—

Jesse Phœnix	£3,690	Patman & Fotheringham, Ltd.*	£3,173
C. J. Newby & Bros.	3,657	W. R. Williams	3,145
H. Roffey	3,487	G. Godson & Sons	3,064
Colls & Sons	3,426	F. Gough & Co.	3,054
J. Grover & Son	3,390	W. Lawrence & Son.	2,984
W. Tout	3,250	Edwards & Medway : Too late.	2,970
Mattock Bros.	3,190		

LONDON.—For the erection of a cottage for the resident engineer at the Brook Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer and Surveyor to the Board :—

E. Proctor & Son	£1,090 0 0	G. Wales & Co., Ltd.	£730 0 0
G. H. Walker	1,027 12 8	H. Kent	680 0 0
A. J. Glock	855 17 6	Enness Bros.	673 0 0
J. F. Holliday	820 0 0	Thomas & Edge	650 0 0
W. E. Champion	810 0 0	T. Cole, 125, Offord-road, Barnsbury, N.*	548 0 0
J. Pratt	785 0 0		
Terry Building Co.	735 0 0		

[The Engineer's estimate was £470.]

LONDON.—For the erection of a cottage for the resident engineer at the Grove Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer and Surveyor to the Board :—

G. H. Walker	£914 2 4	Enness Bros.	£715 0 0
A. J. Glock	880 12 0	Thomas & Edge	700 0 0
J. F. Holliday	799 0 0	H. Kent	665 0 0
T. Pearce	777 0 0	W. & C. Brown	665 0 0
J. Pratt	755 0 0	W. J. Coleman & Co.	584 0 0
G. Wales & Co., Ltd.	750 0 0	T. Cole, 125, Offord-road, Barnsbury, N.*	508 0 0
R. E. Shaw	730 0 0		
Terry Building Co.	723 0 0		

[The Engineer's estimate was £480.]

LONDON.—For removal of screen refuse at the Deptford pumping-station, for the London County Council :—
James Paton & Son* .... 2s. 10d. per cubic yard.

LONDON.—For Jarrah wood blocks, creosoted deal blocks, pitch, and granite kerb, Cambridge-road improvement, Bethnal Green-road, and Green-street, for the Metropolitan Borough of Bethnal Green :—

Wood Blocks.

	Jarrah, per thousand.		Creosoted Yellow Deal, per thousand.	
	9×5×3	9×4×3	9×5×3	9×4×3
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
W. W. Howard & Co., 3, Lloyd's-avenue, Fenchurch-street	—	—	7 6 6*‡	5 18 6
Improved Wood Pavement Co., 46, Queen Victoria-street, E.C.	11 9 6*§	9 6 6*‖	7 15 0	6 7 6

‡ 80,000. § 150,000. ‖ 40,000.

Kerb.

	12in. × 8in Guernsey Flat Kerb (straight).	12in. × 8in Aberdeen Flat Kerb (straight).	12in. × 8in Guernsey Flat Kerb (circular).	12in. × 8in Aberdeen Flat Kerb (circular).	6in. × 12in Guernsey Edge Kerb (straight).	6in. × 12in Aberdeen Edge Kerb (straight).	6in. × 12in Guernsey Edge Kerb (circular).	6in. × 12in Aberdeen Edge Kerb (circular).
	Per ft. s. d.	Per ft. s. d.	Per ft. s. d.	Per ft. s. d.	Per ft. s. d.	Per ft. s. d.	Per ft. s. d.	Per ft. s. d.
A. & F. Manuelle	2 0	2 6	2 2	2 8	1 9	2 1	1 11	2 3
Fry Bros.	2 3	—	2 6	—	2 0	—	2 3	—
W. Griffiths & Co., Ltd., 35-39, Hamilton-house, Bishopsgate-street Without, E.C.	1 11* 1,600 ft.	2 2½	2 1* 400 ft.	2 5½	1 8* 400 ft.	2 0½	1 10*	2 3½ 200 ft.
John Fyfe	—	2 3	—	2 6	—	2 1	—	2 4
J. Mowlem & Co.	2 2	2 7	2 5	2 10	1 10	2 2	2 1	2 5
B. Nowell & Co.	2 2	2 7½	2 4	2 9½	1 10½	2 2½	2 0½	2 4½

Pitch (Cambridge-road Improvement).

	Per Ton.		Per Ton.
Dussek Bros. & Co.	£2 17 6	Grindley & Co., Ltd.	£2 15 0
J. Smart	2 13 0	E. Catchpole & Sons	2 7 6
Burt, Boulton, & Haywood, Ltd., 64, Cannon-street, E.C.*	2 6 6	A. J. Dickinson	2 10 0

LONDON.—For boiler-feed pumps, Greenwich electricity generating station, for the London County Council :—

	£ s. d.	£ s. d.
Mather & Platt, Ltd.	8,483 10 0	—
Baker's Patent Appliances Co., Ltd.	6,734 16 6	—
The Electrical Mining Co., Ltd.	6,691 10 0	—
Crow, Harvey, & Co. (two tenders)	6,680 10 0	& 6,980 10 0
The Rhodes Electrical Manufacturing Co.	6,580 2 0	—
R. W. Blackwell & Co., Ltd. (three tenders)	5,312 2 0	to 5,470 0 0
The Worthington Pump Co., Ltd.	5,161 14 0	—
Worth, McKenzie & Co., Ltd.	5,156 0 0	—
Henry Berry & Co., Ltd.	5,022 0 0	—
Arthur Koppel	5,018 7 0	—
Ernest Scott, Mountain, & Co. (two tenders)	4,788 14 0	& 5,088 14 0
W. H. Bailey & Co., Ltd. (two tenders)	4,731 10 0	& 4,887 0 0
Mirlees, Watson, & Co., Ltd. (two tenders)	4,634 14 0	& 4,744 14 0
The Coalbrookdale Iron Co., Ltd.	4,580 15 0	—
The Goodfellow Engineering Co., Ltd.	4,459 9 6	—
The British Thomson-Houston Co., Ltd. (two tenders)	4,453 0 0	& 4,456 4 0
Pratchitt Bros.	4,380 19 0	—
Andrew Bartclay, Sons, & Co., Ltd. (two tenders)	4,357 0 0	& 4,488 8 0
The British Westinghouse Electric and Manufacturing Co., Ltd. (seven tenders)	4,255 18 0	to 5,792 6 0
Hunter & English	4,174 15 0	—
The Lancashire Dynamo and Motor Co., Ltd. (four tenders)	4,157 11 0	to 4,978 1 0
Johnson & Phillips (four tenders)	3,977 18 0	to 4,125 0 0
Frank Pearn & Co., Ltd.	3,957 10 0	—
The Blake & Knowles Steam Pump Works (three tenders)	3,936 0 0	to 5,171 10 0
The Campbell Gas Engine Co., Ltd. (two tenders)	3,751 9 5	& 4,405 10 6
Bruce Peebles & Co., Ltd.	3,751 0 0	—
The Phœnix Dynamo Manufacturing Co., Ltd. (three tenders)	3,710 19 6	to 3,876 1 6
Bever, Dorling, & Co., Ltd.	3,658 15 6	—
John Cochrane & Co., Glasgow*	3,618 0 0	—
J. G. Moore	3,550 0 0	—
C. A. Musker, Ltd.	3,545 0 0	—
Lowmoor Iron Co., Ltd.	3,410 4 0	—
J. C. Lyell & Co. (incomplete)	3,030 0 0	—

LONDON.—For railway turntables, Greenwich electricity generating station, for the London County Council :—

J. Musgrave & Sons, Ltd.	£2,149 0 0
R. Hudson	1,393 0 0
do.	1,253 0 0
Coalbrookdale Co., Ltd.	1,239 0 0
Whessoe Foundry Co., Ltd.	1,050 0 0
J. & F. Howard	1,050 0 0
J. Hitchen & Son	1,018 10 0
A. Penney & Co.	910 0 0
T. Larmuth & Co.	910 0 0
Heenan & Froude, Ltd.	875 0 0
Isca Foundry Co.	857 10 0
Dick, Kerr, & Co., Ltd.	854 0 0
Hurst, Nelson, & Co., Ltd.	840 0 0
Cowans, Sheldon, & Co., Ltd.	808 10 0
Ransomes & Rapier, Ltd., London*	805 0 0
Patent Shaft and Axletree Co.	791 0 0
Graham, Morton, & Co.†	721 0 0

: Not to specification.

LONDON.—For electric light installations, Deptford and Old Kent-road fire stations, for the London County Council :—

Deptford Station.

National Electric Construction Co., Ltd.	£293 19 6
Barlow & Young	280 0 0
Laing, Wharton, & Cunnington	261 9 0
Drake & Gorham, Ltd.	254 10 0
W. H. Johnson	251 19 0
Tyler & Duncan	240 0 0
Oliver, Clarke, & Co.	240 0 0
F. J. Coleby & Co.	238 10 0
L. Sunderland & Co.	238 0 0
Duncan, Watson, & Co.	226 0 0
A. H. Marshall & Co.	210 0 0
Alliance Electrical Co., Ltd.	198 7 0
F. Hodgson & Co., 24, Queen Victoria-street, E.C.*	185 17 0

Old Kent-road Station.

National Electric Construction Co., Ltd.	£278 2 6
Barlow & Young	260 0 0
Drake & Gorham, Ltd.	241 10 0
Laing, Wharton, & Cunnington	240 9 0
Oliver, Clarke, & Co.	239 0 0
F. J. Coleby & Co.	227 0 0
Tyler & Duncan	225 0 0
L. Sunderland & Co.	223 0 0
W. H. Johnson	210 17 0
A. H. Marshall & Co.	206 0 0
Duncan, Watson, & Co.	202 0 0
Alliance Electrical Co., Ltd.	180 15 0
F. Hodgson & Co., 24, Queen Victoria-street, E.C.*	157 0 0

LONDON.—For the supply of 4,000 loads of West Australian Jarrah timber, for the Lambeth Borough Council. Mr. H. Edwards, Borough Engineer, 346, Kennington-road, S.E. :—

	Per load. £ s. d.	Quantity. Loads.	Date of Delivery.
Millar's Karri & Jarrah Co., Ltd., 72, Bishopsgate-st. Within, E.C.	*6 4 6	4,000	As required.
A. & F. Manuelle	6 13 9	650	During May
		650	,, July
		650	,, Aug. and Sept.
W. Griffiths & Co., Ltd.	6 15 6	650	,, May
		650	,, July
Acme Wood Flooring Co., Ltd.	6 17 6	4,000	As required.
Churchill & Son	7 0 0 plus ½ per cent. brokerage.	4,000	As required.

LONDON.—For the outfit of the Shipman-road Schools, Custom House, E., for the Education Committee. Mr. W. Jacques, Architect to Committee, 2, Fen-court, Fenchurch-street, E.C. :—

Wrinch & Sons	£1,550 0 0
Hammer & Co.	1,267 4 0
Unity Wood & Iron Co.	1,250 0 0
London School Furniture Co.	1,188 16 10
J. D. Bennett	1,150 11 10
Educational Supply	1,099 0 0
Bennett Furnishing Co.	1,025 12 0
North of England S. F. Co.	1,018 7 1
Fisher, Son, & Weaver	974 0 0
Wake & Dean, London*	890 0 0

LONDON.—For residence, Dollis-avenue, Finchley, N., for Mr. Ernest Prater. Messrs. Bennett & Richardson, architects, Finchley, N. :—

Mattock Bros.	£1,075	J. Phœnix*	£875
Steed	937		

LONDON.—For The Retreat, Dollis-avenue, Finchley, N., for Mr. E. Drummond Coates. Messrs. Bennett & Richardson, architects, Finchley, N. :—

E. Denman	£830	J. Phœnix*	£720
C. W. Scott	825		

TENDERS.—*Continued on page 240.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom required.	Premiums.	Designs to be delivered
*Proposed Memorial Building	Eton College	Not stated	No date.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Saddle Tank Locomotive, Dalmuir Sewage Works	Glasgow Corporation	J. Lindsay, City-chambers, Glasgow	Feb. 25
Additions to Electricity Generating Stn., Valley-rd.	Bradford Corporation	Mawson & Hudson, Architects, Exchange-buildings, Bradford	Feb. 26
Bakery, Stables, Byre, Shed, etc.	Grangemouth Co-operative Soc., Ltd.	Wilson & Tait, Architects, 9, Armfield-place, Grangemouth	do.
Wesleyan Church and Schools, Widnes	The Trustees	C. W. D. Joynson, Architect, Wednesbury	Feb. 27
C.I. Water Pipes	Hythe Corporation	C. Jones, Borough Surveyor, Hythe, Kent	do.
Materials	Halifax Corporation	J. Lord, Borough Engineer, Town Hall, Halifax	Feb. 29
Painting, etc., Police Station, Harrison-road	do.	do.	do.
Brick Culvert in New Bank	do.	do.	do.
Materials, Electricity Committee	Salford Borough Council	Borough Electrical Engineer's Office, Frederick-road, Pendleton	do.
Oils, Varnishes, etc. (Tramways)	Sheffield Corporation	A. R. Fearnley, Tramways Department, Town Hall, Sheffield	do.
Sewers, Knaresbrook and Leeds Roads	Harrogate Corporation	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	do.
Six Houses at Beddan, near Caerphilly	.....	A. O. Evans, Architect, Pontypridd	do.
Diversion of Wellington-road, etc.	Cal. Ry. Co. & G.N. of Sctld. Ry. Co.	P. M. Barnett, C.E., 80, Guild-street, Aberdeen	do.
Reconstruction in Steel, Guild-st. Bridge, Aberdeen	do.	do.	do.
Branch Railway and Siding, near High Glengall	Ayr District Asylum	A. Stevenson, C.E., 14, Cathcart-street, Ayr	do.
Annual Contracts	Southend-on-Sea Corporation	E. J. Elford, Borough Surveyor, Southend-on-Sea	do.
Materials	Esher and the Dittons U.D.C.	A. J. Henderson, Eng., C'cil Offices, Brabant Villa, Thames Ditton	do.
Street Works, North-street, Didsbury	Wellington U.D.C.	A. H. Mountain, Engineer, Town Hall, Wellington, Manchester	do.
Bakers' Stables, Cauldwell-hall-road, Ipswich	Ipswich Indust. Co-op'tive Soc., Ltd.	F. E. L. Harris, A.R.I.B.A., 1, Balloon-st., Manchester	do.
Four Houses, etc., High-street, Hanging Heaton	.....	J. H. Brearley, Architect, Branch-road, Batley	do.
Class-rms., etc., Westg'te Con. Schl., Heckmondwike	.....	H. Stead, Architect, Heckmondwike	do.
Broken Stone and Gravel	Penarth U.D.C.	E. J. Evans, Surveyor, 9, Quay-street, Cardiff	do.
Fire Station, etc., Borough-road	Darlington Corporation	G. Winter, Borough Surveyor, Town Hall, Darlington	do.
Materials	Great Central Railway Co.	A. W. Longden, Cornwell-street, Ogden-lane, Openshaw	Mar. 1
Cemetery Chapel, Lodge, Gates, etc.	Wellingborough U.D.C.	Talbot, Brown, & Fisher, Architects, Burystead-pl., Wellingboro'	do.
Forming Roads, etc.	do.	Sharman & Archer, Market-place, Wellingborough	do.
Painting, etc., Borough Surveyor's Office	Hertford Corporation	Borough Surveyor's Office, Hertford	do.
Painting Swimming Baths, Hartham	do.	do.	do.
Furnishing Union Offices and Infirm Block	Ecclesall Bierlow Guardians	T. Smith, Union Offices, The Edge, Sheffield	do.
Additions to Residence, Savile Park, Halifax	.....	G. Buckley & Son, Architects, Tower-chambers, Halifax	do.
Stores	Derby Borough Council	J. Ward, Borough Surveyor, Municipal Offices, Derby	do.
Dust Destructor and Electricity Supply Extension	Bermondsey Borough Council	Town Hall, Spa-road, Bermondsey	do.
430 Tons of British Steel Bridge Girders	G.W. Railway Co.	Engineer, Paddington Station, London	do.
650 Tons of Broken Stone	Ivybridge U.D.C.	W. R. Parker, Surveyor, Ivybridge	do.
Bed for Engine at Electricity Works	Halifax Corporation	J. Lord, Borough Engineer, Town Hall, Halifax	do.
Painting, etc., Methodist Chapel, Adwalton	.....	The Chapel	do.
Alterations to Boiler House, Gayton	King's Lynn Corporation	H. J. Weaver, Borough Surveyor, Town Hall, King's Lynn	do.
Five houses, Fulford, York	Mr. G. Wood	A. H. Everist, Architect, 8, New-street, York	do.
Savick Bridge Works, Preston, Lancs.	Lancashire County Council	County Bridgemaster's Office, Preston	do.
Materials	Chingford U.D.C.	H. Bird, Clerk, 14, The Parade, Chingford, Essex	do.
Annual Contracts	Sutton (Surrey) U.D.C.	C. C. Smith, Municipal Offices, Sutton, Surrey	Mar. 2
Paving Works, Lennox-road	Hove Corporation	H. H. Scott, Borough Surveyor, Town Hall, Hove	do.
Paving Works and Cab Stands, Lansdowne road	do.	do.	do.
Making-up Park and Dean Roads, Hounslow	Heston and Isleworth U.D.C.	P. G. Parkman, Engineer, Town Hall, Hounslow, W.	do.
Watson's-lane Sewers	do.	do.	do.
Granite, etc.	Doncaster R.D.C.	W. R. Crabtree, Highway Surv., Union Offices, High-st., Doncaster	do.
Two Houses, Morton-terrace, Wigton-road, Carlisle	Miss Howe	Johnstone Bros., Architects, 39, Lowther-street, Carlisle	do.
Four cottages at Nunthorpe	N.E. Railway Co.	W. Bell, Architect to the Company, York	do.
Alterations to Parish Church, Brandon	.....	W. Morton, 27, John-street, Sunderland	do.
Paving and Flagging Streets	Leeds Corporation	City Engineer's Office, Municipal Buildings, Leeds	do.
Making-up Falmer-road and Cross-road	Enfield U.D.C.	R. Collins, Surveyor, Public Offices, Enfield	do.
Additions to Porter's Lodge at Workhouse, Crumpsall	Manchester Guardians	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester	do.
Low-water Swimming Pond	St. Andrews Town Council	W. Watson, Burgh Surveyor, St. Andrews	do.
Locks for Craiglockhart Poorhouse	Edinburgh Parish Council	A. Ferrier, Parish Council-chambers, Castle-terrace, Edinburgh	do.
Open-air Swimming Baths	Bristol Corporation	T. H. Yabbicorn, City Engineer, 63, Queen-square, Bristol	do.
Workshops, Shotton Colliery	Horden Collieries, Ltd.	G. Wells, Shotton Colliery	Mar. 3
C.I. Water Pipes	Hipperholme U.D.C.	G. W. Thompson, Surveyor, Council Offices, Hipperholme	do.
Stores	Gas and Electricity Com., Stockport	Engineer, Gasworks, Portwood, Stockport	do.
Road Materials and Cartage	Eastbourne R.D.C.	T. E. Varley Kirtlan, Clerk, 92, Terminus-road, Eastbourne	do.
Public Conveniences, Waterloo Park	Norwich Corporation	A. E. Collins, City Engineer, Guildhall, Norwich	do.
*Triennial Contracts for Repairs	Receiver for Metrop. Police District	Police Surveyor, New Scotland Yard, S.W.	do.
Shed at Deepwater Berths	Sligo Harbour Commissioners	Office of Commissioners, Town Hall, Sligo	do.
Wesleyan Church, Mawdesley, near Ormskirk	Trustees	J. Jameson Green, Architect, 19, South John-street, Liverpool	Mar. 4
Materials	Estates Department, Bristol Corp.	City Valuer, Council House, Brond-street, Bristol	do.
New Fryston Waterworks	Pontefract R.D.C.	J. Waugh, C.E., Sundridge-chambers, Bradford	do.
One-story Building at Workhouse, Gravelly Hill	Aston Guardians	Whitwell & Son, Architects, 23, Temple-row, Birmingham	do.
Granite	Market Harborough R.D.C.	C. Burgoine, Clerk, Market Harborough	do.
House, Maryport, Cumberland	J. Hodgson	C. Eaglesfield, Architect, Maryport	do.
Five Houses and Shop in Poyser-street, Wrexham	.....	J. Pinder, C.E., 98, Ruabon-road, Wrexham	do.
Building Materials, etc.	Cardiff Guardians	A. J. Harris, Clerk, Queen's-chambers, Cardiff	do.
Taking-down & Rebldg. Tabor Ch'l., Cefn, nr. Merthyr	.....	T. Roderick, Architect, 50, Glebeland, Merthyr	do.
Library and Reading-room at Resolven, near Neath	.....	J. Cook Rees, Architect, Neath	do.
Material	Belper R.D.C.	R. C. Cordon, Surveyor, Duffield, near Derby	Mar. 5
Goods and Materials	Colchester Corporation	H. Goodyear, Borough Engineer, Town Hall, Colchester	do.
Derbyshire Lime	do.	do.	do.
Granite	Billesdon R.D.C.	W. E. Richardson, Clerk, 18, New-street, Leicester	do.
Materials	Shardlow R.D.C.	J. S. Wooddisse, Weston-on-Trent, Derby	do.
Disinfectants	Rotherham R.D.C.	B. Hey, Surveyor, 29B, High-street, Rotherham	do.
Nightsoil Removal	do.	do.	do.
Granite, Limestone, and Slag	do.	R. Bradbury, District Surveyor, 29B, High-street, Rotherham	do.
A Well, and Boring and Lining	Thame U.D.C.	J. Taylor, Sons, & Santo Crimp, 27, Gt. George-st., Westminster	do.
Water Supply, Contract No. 2	Kidderminster Corporation	Willcox & Raikes, Eng., Union-ch., 63, Temple-row, Birmingham	do.
Materials	South Shields Corporation	S. E. Burgess, Borough Engineer, Chapter-row, South Shields	do.
25 Tons of Pig Lead, Masham Station, N.E. Ry. Co.	Harrogate Corporation	E. W. Dixon, Engineer, 14, Albert-street, Harrogate	do.
Stores, etc.	Sanitary Committee, Leeds	G. Darley, Superintendent, Dock-street Depot, Leeds	do.
Sawdust and Shaving Collecting Plant	Manchester Tramways Committee	J. M. M'Elroy, Tramways Department, 55, Piccadilly, Manchester	do.
Woodworking Machinery	do.	do.	do.
Quarrying, Laying, etc., Materials	Castle Ward R.D.C.	D. Hope, Surveyor Ponteland, Newcastle-on-Tyne	do.
Broken Whinstone	do.	do.	do.
Alterations, etc., to Schools, Castle-street	Abergavenny School Board	E. A. Johnson, F.R.I.B.A., Architect to Board, Abergavenny	do.
Alterations, etc., to Schools, Hereford-road	do.	do.	do.
Two Houses, Settle-street, Millom	.....	Settle & Brundrit, Architects, Ulverston	do.
Administration Bldgs. at Bunker's Hill, Whitley-rd.	Thornhill U.D.C.	S. W. Parker, Surveyor, Council Offices, Thornhill, Yorks	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Making Bricks	Cwmgorse Brickworks Co.	S. Jenkins, Cwmgorse Farm, Gwaun-cae-Gurwen, Glamorganshire	do.
Pulling-d'n, Rebldg. Crown & Cannon Inn, Winlaton	Exors. of late G. Parker	J. G. Crone, Arch., 21, Grainger-street West, Newcastle-on-Tyne	do.
Repairs to Inner Basin of Kilkeel Harbour	.....	J. Heron, County Surveyor, Court House, Downpatrick	do.
*Annual Contracts	M.B. Stepney	Borough Engineer, 15, Great Alie-street, Whitechapel, E.	do.
*Road Materials	St. Helen's Corporation	G. J. C. Broom, Borough Surveyor, St. Helen's, Lancs.	do.
Forty Glazed Doors	Wimbledon Public Libr. Committee	H. W. Bull, Librarian, Wimbledon	Mar. 6
Granite Setts, Ballast, and Cement	Southampton Corporation	J. A. Crowther, Borough Engineer, Municipal Offices, Southampton	Mar. 4
Granite for Roadways	Oxendon R.D.C.	W. J. Smith, Coventry-road, Market Harborough	do.
New Streets	Hebburn U.D.C.	H. Paterson, Surveyor, Argyle-street, Hebburn	do.
Annual Contracts	Finchley U.D.C.	E. H. Lister, Council Offices, Church End, Finchley	do.
Materials, Newcastle-on-Tyne Tramways	Tramways Committee	Tramway Department, Manors, Newcastle-on-Tyne	do.
2,000 Tons of Slag	Clown R.D.C.	E. H. Barber, Surveyor, Hollin-hill, Clown, Chesterfield	do.
Steel Sleepers and Keys, Uganda Railway	Crown Agents for the Colonies	Office of the Crown Agents, Whitehall-gardens, London, S.W.	do.
Taking Down Cottages, etc., Child.'s Home, Park-rd.	Bradford Guardians	F. Holland, Eng. & Arch., 11, Parkinson's-ch., Hustlergate, Bradf'd.	do.
Stores	Huddersfield Gas Committee	E. A. Harman, Engineer, Gasworks, Huddersfield	do.
Residence, Lodge, Cottage, and Stable, at Lightcliffe	.....	J. F. Walsh & G. Nicholas, Archs., Museum-chambers, Halifax	do.
Power and Lighting Circuits, etc., Stavordale-road	Corp. Weymouth & Melc'be Regis	R. N. Howard, Town Clerk, Municipal Offices, Weymouth	do.
Electricity Meters	do.	do.	do.
Carnegie Public Library, West Park, Anlaby-road	Hull Corporation	J. H. Hirst, City Architect, Town Hall, Hull	do.
Cement, Broken Stone, etc.	Manchester Corporation	J. M. M'Elroy, Corporation Tramways, 55, Piccadilly, Manchester	do.
Tramway Stores	do.	do.	do.
Little Town Bridge Works, Winchester	.....	W. J. Taylor, County Surveyor, The Castle, Winchester	do.
Redding Sewerage and Sewage Disposal Works	Eastern District Committee, Stirling	Warren & Stuart, Engineers, 94, Hope-street, Glasgow	do.
Street Works, Jenkins-terrace, Abergwynfi	Glyncorrwg U.D.C.	W. P. Jones, Surveyor, Council Offices, Cymmer, Port Talbot	Mar.
Annual Contracts	Shoreditch Borough Council	H. M. Robinson, Shoreditch Town Hall, Old-street, E.C.	do.
Fire Alarms and Telephones, Caterham Asylum	Metropolitan Asylums Board	Office of Board, Embankment, London, E.C.	do.
Engineers' Tools, etc., Joyce Green Hosp., Dartford	do.	do.	do.
Rolling Stock, etc.	South Indian Railway Co.	H. W. Notman, 55, Gracechurch-street, London, E.C.	do.
Repair of Private Roads	Croydon Corporation	Borough-road Surveyor's Office, Town Hall, Croydon	do.
Church, Cark-in-Cartmel	Trustees of Wesleyan Church	Sames & Henshaw, Arch., Oxford-chambers, Abbey-rd, Barrow	do.
Sewer Pipes	Bath Corporation	City Surveyor, Bath	do.
10, 20, and 40 ft. Spans	Secretary of State for India	Director-General of Stores, India Office, Whitehall, S.W.	do.
Cast-iron Pipes (Gas Department)	Glasgow Corporation	A. Wilson, Gas Engineer, 45, John-street, Glasgow	do.
*Supply of Waterproof Clothing	West Ham Borough Council	Borough Engineer, Town Hall, Stratford, E.	do.
*Refuse Destructor Buildings	Bromley Borough Council	Borough Engineer, Bromley, Kent	do.
Materials	Bingham R.D.C.	R. H. Beaumont, Clerk, Market-place, Bingham	Mar. 9
6,120 Yards of Sewers	Drighlington U.D.C.	J. Waugh, Engineer, Sunbridge-chambers, Bradford	do.
Plate Girder Deck Spans	East India Railway Co.	C. W. Young, Nicholas-lane, London, E.C.	do.
Insitu Concrete to Footways	South Shields Corporation	S. E. Burgess, Borough Engineer, Chapter-row, South Shields	do.
Street Improvement Works	Andenshaw U.D.C.	W. Clough, Surveyor, 2, Guide-lane, Andenshaw	do.
Wesleyan Ch. and Schools, Linthorpe-rd., Middlesbro'	.....	W. J. Morley & Sons, Architects, 269, Swan-arcade, Bradford	do.
*Making-up and Paving Roads	Hammersmith Borough Council	Borough Surveyor, Town Hall, Hammersmith	do.
*Prov. & Fix. Elec. Light Fittings, etc., Gainsboro'-rd.	Hackney Union	Clerk's Offices, Sidney-road, Homerton, N.E.	do.
Elec. L. Fogs., Cas.Wds, etc., G'boro'-rd., H'kney Wick	Hackney Guardians	W. A. Finch, Architect, 76, Finsbury-pavement, E.C.	do.
Quarrying and Carting Road Materials	Linlithgow County Council	A. Forbes, County Road Office, Linlithgow	do.
Branch Library, Morningside-road	Edinburgh Corporation	R. Morham, City Arch., Public W'ks Office, City-ch., Edinburgh	do.
*Painting and Cleaning Hospitals	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	do.
*Sanitary Annexes, Caterham Asylum	do.	do.	do.
Lighting of Public Lamps	Slough U.D.C.	G. H. Charsley, 11, Mackenzie-street, Slough	Mar. 10
Materials	Withington U.D.C.	A. H. Mountain, Engineer, Town Hall, Withington, Manchester	do.
Repairs and Painting at Workhouse	Newhaven Guardians	W. Gates, Clerk, 86, High-street, Lewes	do.
*Making-up Roads	Ealing Town Council	Borough Engineer, Town Hall, Ealing, W.	do.
Gas Cooking and Heating Stoves, etc.	Belfast Gas Committee	Manager, Gasworks, Ormeau-road, Belfast	do.
Stone Bridge, Llandowror	Carmarthen R.D.C.	The Rectory, Llandowror	Mar. 11
Road Material (Whinstone, etc.)	Flaxton R.D.C.	J. Peters, 4, New-street, York	do.
Slag	Kiveton Park R.D.C.	J. P. Evans, Sur., Council Offices, Kiveton Pk. Station, Sheffield	Mar. 12
Limestone and Granite Macadam, etc.	Burnley R.D.C.	S. Edmondson, Surveyor, 18, Nicholas-street, Burnley	do.
Supplies, Electricity Department	Wrexham Town Council	W. Sillery, Borough Electrical Engineer, Willow-road, Wrexham	do.
Filters at Gorbals Works, near Barrhead	Glasgow Corporation	J. R. Sutherland, Engineer, 45, John-street, Glasgow	do.
Pipework, etc., Electric Light Supply	Kilmarnock Corporation	W. Middlemass, Town Clerk, Kilmarnock	Mar. 14
Supplies	Eccles Corporation	T. S. Picton, C.E., Town Hall, Eccles	do.
Extension of Porter Warehouse, Belfast	G.N. Ry. Co. (Ireland)	W. H. Mills, Engineer, Amiens-street Terminus, Dublin	do.
Building for Parcels Post, Portadown	do.	do.	do.
Extension of Goods Store, Carrickmacross	do.	do.	do.
Coal Store, Enniskillen	do.	do.	do.
Station Building, Victoria Bridge	do.	do.	do.
C.I. Pavement and Road Box Frames and Covers, etc.	Edinburgh Corporation	Resident Engineer's Office, 5, Dewar-place, Edinburgh	do.
4,500 Yards Concrete Paving, High-st., Felixstowe	Felixstowe and Walton U.D.C.	F. B. Jennings, Clerk, Town Hall, Felixstowe	Mar. 15
Broken Slag	Blyth and Cuckney R.D.C.	F. Hopkinson, Surveyor, 40, Bridge-street, Worksop	do.
Alterations to Cookery Centres	Rotherham Education Committee	J. Platts, Architect, High-street, Rotherham	do.
Stores and Work	Belfast Works Committee	Superintendent of Works Office, Town Hall-street, Belfast	do.
*Enlargement of Sorting Office, Chippenham Station	Commissioners of H.M. Works, etc.	Postmaster, Chippenham	do.
Telephones and Fire Alarms	Gainsborough U.D.C.	R. W. Fraser, Electrical Engineer, Engineer's Office, Gainsborough	Mar. 16
*Making-up and Paving Road	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham	do.
*Enlargement of Post Office, Lichfield	Commissioners of H.M. Works, etc.	J. Wager, H.M. Office of Works, Storey's-gate, S.W.	do.
*Baptist Chapel, Surbiton	.....	A. Mason, Broughton-chambers, Surbiton	Mar. 17
*New Sorting Office, Finsbury Park	Commissioners of H.M. Works, etc.	J. Wager, H.M. Office of Works, Storey's-gate, S.W.	do.
Supplies, Electricity Department	Wimbledon U.D.C.	Electric Light Works, Durnsford-road, Wimbledon	Mar. 18
Valves & Pipes for Storage Reservoir, Thorpe Malsor	Kettering U.D.C.	T. R. Smith, Engineer, Market-place, Kettering	do.
*New Coastguard Buildings, Sea View	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
Fire Escape Staircases at Oulton Workhouse	Matford and Lothingland Guardians	R. Scott Cockrill, A.R.I.B.A., Crossley House, Lowestoft	Mar. 19
Sewerage Works, Hargarth Ings, Tadcaster	Tadcaster R.D.C.	Martin & Fenwick, Engineers, 1, Park-place, Leeds	do.
Waterworks, Portadown and Banbridge	Joint Waterworks Board	W. Wilson, Clerk, Town Hall, Portadown, Ireland	Mar. 21
Schools, Antrim	Select Vestry of Parish Church	W. J. Fennell, Architect, 2, Wellington-place, Belfast	do.
Subway, &c., Bolckow-rd., Grangetown, R.S.O., Yorks	Eston U.D.C.	C. McDermid, Surveyor, Council Offices, Grangetown	Mar. 22
Excavating, Drainage and Roads (Contract 2)	do.	do.	do.
Steel Girder Bridge	do.	do.	do.
Electricity Works Extension	Ilford U.D.C.	J. W. Fenton, Clerk, Town Hall, Ilford	do.
Brick Sewer, Borough-road	Birkenhead Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead	Mar. 23
*Additions to Asylum at Garlands	Cumberland, etc., Joint Asy. Com.	C. W. Allan Hodgson, The Courts, Carlisle	Mar. 26
Stone Bridge, etc., Powbeck, Dalston	Carlisle R.D.C.	J. Graham, Engineer, Bank-chambers, Bank-street, Carlisle	Mar. 31
Trans-Conti. Ry. on Land Grant System, S. Australia	Railways Commissioner, Adelaide	H. A. Grainger, Agent-General, Threadneedle House, E.C.	April 1
Pulling Down & Rebuilding Victoria Hotel, Carlisle	F. M. Laing	Oliver & Dodgshun, Architects, Carlisle	No date.
Excavating for Fourteen Houses, Park-avenue, Barry	.....	E. David & David, 27, High-street, Cardiff	do.
Welsh Baptist Ch. and Minister's House, Ynysboeth	.....	Ivor Jones & T. E. Richards, Archs., 18, St. Mary-street, Cardiff	do.
Ward, Astley Sanatorium	Leigh Joint Hospital Board	Travers & Ramsden, Architects, Leigh, Lancs.	do.
New Streets, Armley	Albion Allotments Society	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Elec. Lighting, Laundry Plant, etc., Omoa Poorhouse	.....	A. Cullen, F.R.I.B.A., Clyde-street, Motherwell, N.B.	do.
Primitive Methodist Chapel, Simms Cross, Widnes	.....	Moulds & Porritt, Architects, 77, King-street, Manchester	do.
Parcel Post Office, Waterloo-street, Glasgow	Com'rs. H.M. W'ks & Public Bldgs,	H.M. Office of Works, Edinburgh	do.
*Internal Painting of Chapel, Bayswater	.....	T. H. Ferryman, Surveyor, 33, Chancery-lane, W.C.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Assistant-Surveyor	Stroud U.D.C.	2*l.* per week	Mar. 2
*Clerk of Works	Bethnal Green Borough Council	3*l.* 10s. per week	Mar. 7
*Furniture Superintendent	School Board for London	200*l.*	do.
*Clerk of Works and Farm Bailiff	Croydon Borough Council	130*l.*, etc.	Mar. 10

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. xii. *Public Appointments*, xix.

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TENDERS—*Continued from page 237.*

LONDON.—For roads and sewers on Section B, White Hart-lane estate, Wood Green, for the London County Council:—

Martin, Wells, & Co., Ltd.	£8,327 0 0
A. B. Champness	8,294 12 11
Wm. Griffiths & Co., Ltd.	7,753 11 5
Joshua Macklin	7,616 12 2
Thomas Adams	7,386 14 4
J. & E. Bloomfield	6,955 0 0
Grounds & Newton	6,836 15 4
R. Ballard, Ltd.	6,657 0 0
F. J. Coxhead, 45, Bulwer-road, Leytonstone*	6,464 0 0

[The architect's estimate comparable with these tenders amounts to £7,370.]

LONDON.—For the reconstruction, for electrical traction, of the Streatham cable tramways, and construction of authorised tramways at Tooting, for the London County Council:—

George Law	£128,587 11 3 !
William Kennedy	113,896 12 11
John Mowlem & Co., Ltd.	111,710 0 0
Pethick Bros.	110,142 16 8
R. W. Blackwell & Co., Ltd.	104,604 10 6
William Underwood & Bro.	99,221 0 0
Edmund Nuttall & Co.	97,132 13 1
Dick, Kerr, & Co., Ltd.	95,751 7 9
J. G. White & Co., Ltd.	95,005 7 4
W. Griffiths & Co., Ltd., London†	86,623 19 11 !

‡ Recommended for acceptance.

LONDON. — For fuel economisers, Greenwich electricity generating station, for the London County Council:—

Goodbrand & Co.	£3,164 13 11
Clay Cross Co.	3,150 15 6
E. Green & Son, Ltd., Wakefield*	3,071 6 0
Arthur Lowcock, Ltd.	3,060 8 0
James Carter & Sons‡	2,518 8 6

‡ Not to specification.

LONG SUTTON (Lincs.).—For supply of granite, slag, etc., for the Urban District Council. Mr. A. A. Piccaver, Surveyor, Long Sutton:—

	700 tons. Price of XX.	200 tons. Slag 1½in.	Steam Rolling. 350 tons. Price of X.	200 tons. Slag 2½in.
	s. d.	s. d.	s. d.	s. d.
A. Brunton & Son	11 4	—	10 7	—
	—	—	9 6†	—
Croft Granite, etc., Co., Ltd.	10 7	—	11 0	—
Cliff Hill Granite Co., Ltd.	11 0	—	11 0	—
Enderby & Stoney Stanton Granite Co., Ltd.	11 0	—	10 9	—
Forest Rock Granite Co., Ltd.	11 0	—	10 8	—
Groby Granite Co., Ltd., Groby, near Leicester	10 8*	—	10 4*	—
W. Grimley & Co., Sutton Bridge, Lincs.	10 7	7 10*	10 4	7 10*
Islip Iron Co., Ltd.	—	7 4§	—	7 5
Kaltenbach & Schmitz	12 6	—	12 3	—
London Basalt Stone Co., Ltd.	12 3	—	12 3	—
William Prestwich	—	7 6	—	7 8
J. F. Shackleton & Son	11 8	—	11 8	—
Whitwick Granite Co., Ltd.	10 11 best qual.		10 11	—
	9 5	—	9 5	—

† Scotch delivered on quay at Sutton Bridge.
§ 1½in. ‖ 2in. to 2½in.

MITCHAM.—For 400 tons of Guernsey granite spalls at Workhouse, Western-road, Mitcham, for the Guardians of Holborn Union:—

Guernsey Spalls.

	per ton. s. d.		per ton. s. d.
W. Griffiths & Co., Ltd.	11 9	A. & F. Manuelle	10 7
J. Mowlem & Co., Ltd.	11 5	John Hall	10 6
L. Sommerfeld	10 8	Fry Bros., Lion Wharf, Greenwich*	9 11

Jersey Spalls.

Ronez Granite Quarries, Ltd.	9 5

NORTH SHIELDS.—For alterations and additions to new board room and offices in Northumberland-square, for the Tynemouth Guardians. Mr. H. Gibson, architect, Wellington-chambers, North Shields. Quantities by architect:—

J. D. Greenwell, Whitley Bay*	£598 10 0

SHEFFIELD.—For heating apparatus, Hammerton-street Council School, for the Education Committee:—

C. Pearce & Son, Sheffield*	£450 0 0

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Plumber: Thos. Firth, Marsden	90 10 0
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The Builder.

VOL. LXXXVI.—No. 3187. MARCH 5, 1904.

ILLUSTRATIONS.

House at Scarborough:—
Plan and Elevations
Perspective View
View of Loggia
} ....Messrs. Bedford and Kitson, Architects.

A Country House ....Mr. A. H. Crawford, F.R.I.B.A., Architect.
Clive Church, Shrewsbury ....Mr. C. J. Ferguson, F.S.A., Architect.
Sculpture: "Three Generations" ....By Mr. Leonard Jennings.
Design for Clifton School War Memorial ....By Mr. W. L. Lucas.

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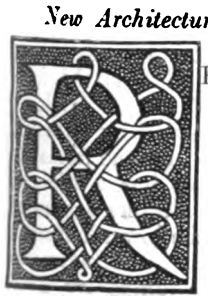
New Architecture at Cambridge.



READERS of the daily papers may have been struck with the attention recently given to the description of new buildings at Cambridge. This unwonted attention does not, however, arise from any interest in the architectural aspect of Cambridge—half the colleges on the banks of the Cam might be rebuilt and the daily papers would never trouble their heads about it—but on account of the fact that the King made a special visit to Cambridge to open them or declare them open. In England loyalty is a much stronger force than art. Of the three new buildings in the neighbourhood of Downing-street—for in an architectural sense there are only three, the Sedgwick Museum and the Law Library forming one block—two have been already illustrated and described in our columns; but a survey of their effect on the ground may be appropriate at this juncture, when they are outwardly complete, or nearly so.

Downing-street is a narrow street turning westward out of the main artery of Cambridge, just opposite the heavy classic front of Emmanuel College; but south of it is a large open piece of park, the property of Downing College, which occupies the south end of this space, and at the north end the University has purchased from the college sufficient land to form a spacious site for the Botanical School, and for the building in which are housed both the Sedgwick Museum and the "Squire" Law Library and the Law School, and to which is to be added ultimately an archæological museum as a return wing. On the north side of Downing-street, and nearly opposite, is the new Medical School with its pendant, the Humphrey Museum.

The long range of buildings containing the Law Library and the Geological Museum, of which Mr. T. G. Jackson is the architect, extend along the south side of Downing-street, with a return wing, at a slightly obtuse angle, along Downing-lane on the east of the site. The Law Library forms the main feature in the Downing-street front, rising higher than the rest, and emphasised by the five lofty windows of the library on the upper floor. It is not central in the design, nor does the architectural treatment adopted require that it should be, as the design of the front on each side of it is not symmetrical; the whole is freely treated in a manner arising out of the requirements of space of the different departments. The Sedgwick Museum occupies the larger eastern portion of the façade, and turns round the corner along Downing-lane. The Law School, and the beginning of what will be the Archæological Museum wing, occupy the smaller portion on the west side. Beneath the three central windows of the Law Library is a triple arcaded and vaulted gateway with coupled columns, leading into the large open space at the back, at the other side of which, but not centralised, is the separate building, by Mr. W. C. Marshall, which forms the Botanical School and Museum. The Downing-street front of Mr. Jackson's buildings runs to about 440 ft. in length, so that it will be seen that this is an architectural scheme on a pretty large scale. The main entrance to the Geological Museum is not from the street but from the court-yard; the door, which is on the first-floor level, is reached by a double exterior flight of stone stairs treated in a decorative manner, the balustrades terminating at the foot in sculptured bisons on one side, and sculptured bears on the other. We do not exactly see the relation of these animals to a geological museum, inasmuch as they are not extinct (though the bison is likely to be so before long), and, therefore, do not come under that study of palæontology which is so closely connected with geology; but we are truly glad to find any architect having the courage to revive that fine feature, the exterior staircase, so common in the Renaissance period, and which is supposed to be so much at variance with our ideas of comfort in the present day. It is in a University city, however, that we may expect to find, if anywhere, the spirit that will prefer a little bit of effect like this to the considerations of mere every-day and prosaic convenience. It was to gain this, probably, that the principal

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entrance was made on the courtyard side; there would not have been space for the staircases on the street side. When the west return wing is complete, we gather that there will be a similar exterior staircase entrance to the Archæological Museum. The steps and entrance to the Geological Museum, and the portions of the building adjacent, were illustrated in our issue of May 9, 1903.

The erection of new buildings on a large scale in an ancient University town is an architectural event of some importance, and one which inevitably suggests a reference to the continual conflict, in modern architecture, between the claims of tradition and of originality, and the difficulty of reconciling them. If ever there was an architectural situation in which tradition might be said to have the higher claim, it is in the case of an ancient University. In the very air of such a place tradition is strong; many of its usages, its regulations, even to some extent its habits of thought (to too great an extent, some may think), are governed by respect for tradition. And the old Renaissance buildings of Cambridge have about them a kind of air of the best traditions of a school of architecture which, in a peculiar degree, combines refinement of detail with general dignity of aspect. It is easy to see that this element in the architecture of the past in Cambridge has not been out of the mind of the architects of the new buildings to the south of Downing-street. Mr. Jackson has given ample evidence already, in his Oxford buildings, that such considerations are prominent and important to him; *genius loci*, in spirit and intent, is writ large on many of his buildings, not excluding this latest University building at Cambridge. There have been times and occasions when the architectural traditions of Oxford and Cambridge have received no such recognition, and when buildings have been erected for the uses of the University which seemed rather to breathe the spirit of the prosperous manufacturing town without a past. Even the great mass of the Johnian Chapel at Cambridge, correct revived Gothic by an "eminent hand," has the air of an interloper on the scene, with the look of a Colonial cathedral rather than a college chapel; and there have been worse developments than that. In the present new buildings to the south of Downing-street there is nothing to suggest the trail of the manufacturing town; the details are restrained and unobtrusive, and suggest the influence of the late Gothic and the free Renaissance which are the prevailing elements in Cambridge architecture, without direct imitation. Yet, when comparing them with the older buildings in the neighbourhood, one cannot but doubt whether tradition might not have been a little more completely kept up with advantage. Both the geological buildings and the botanical school, while they show the influence of the Cambridge atmosphere, seem to want the dignity and unity of effect which belongs to the old buildings. The latter look better in reality than they do in drawings; the new ones strike us as looking better in drawings than they do in reality. The employment of brick for the general mass of the walls is, of course, much to their disadvantage in comparison with many of the old buildings; but what strikes one also is that, with many interesting points, there is a want of that coherence and wholeness of design and character which belongs to old architecture of the same class; it is not, to borrow a literary criticism, "sufficiently inevitable." The rather staring red-brick arches in the ground floor next the court, for instance, disturb the effect; the heavy round moulding on the set-offs of the interior buttresses of the law library clashes with other details and looks coarse; the cupola over the tower on the courtyard side does not seem to fit well into the composition. The architecture has the look of having been designed in parts rather than as a whole. The treatment of the large windows of the library on the inner side, with alternate straight and curved pediments, seems more pleasing than the canted bays on the street side, with no particular finish at top; another little point in which we think tradition has the best of it. Mr. Marshall's botanical building cannot be accused of being designed piecemeal; it presents a centre feature with a large segmental gable of Georgian fashion, and wings pierced regularly with two tiers of large mullioned windows. Nothing could be simpler; but it looks rather bald, and one feels here again that the ancient buildings have the advantage in dignity. The windows do their duty; the interior is admirably lighted; but the external appearance is, for a University building, rather commonplace.

The interior of the geological museum is well arranged as to lighting, with the good old common-sense arrangement of cases placed at right angles to the wall between the windows, so as to give each case a good side light. Onslow Ford's statue of Sedgwick is admirably characteristic, but it is not effectively placed; it should have been seen down a vista, whereas it fronts only to the opposite side of one of the galleries.

Mr. Prior's medical school on the north side of Downing-street rather clashes with Mr. Jackson's building; it belongs to so different a type of architecture. The object has evidently been to give to the exterior the plain and almost stern aspect proper to a building erected for purely technical study. This severity of style is combined with a certain degree of architectural character, and, though the treatment has less of tradition than the opposite building, it has the merit of unity of design. The carving in the panels under the pediments of the bay windows is rather coarse and out of scale with the rest. We doubt whether the freak of planting on the Humphrey museum building at an oblique angle to the rest produces any effect to compensate for the inconvenience in planning occasioned, nor does the heavy and severe style of architecture employed lend itself very well to this picturesque irregularity. The Humphrey museum is a nice interior, but contains another freak which would annoy us every time we had to enter the room. Two of the dark bands formed in the floor pavement coincide with the position of the columns; the next one is a foot out of centre with the columns. No Renaissance architect would ever have done that.

THE ARA PACIS AUGUSTÆ.

APART from the excavations of the Forum, the topic of the hour in archæological circles is the Ara Pacis Augustæ. It formed the subject of an admirable lecture recently delivered by Mr. H. Stuart Jones, Director of the British School at Rome, to the British and American Archæological Society, and an abstract of his remarks may be of some interest.

The erection of the altar was decided upon by the Senate in 13 B.C. on the occasion of Augustus's return to Rome, after the restoration of peace and order in the western half of the empire, and it was completed, or, at any rate, dedicated, on July 4 in 9 B.C.

The altar itself was surrounded by a wall of blocks of white marble about 2½ ft. in thickness, which reached a height of about 13 ft. This enclosure measured some 34 ft. by 38 ft., and had two* openings, each 12 ft. in width, in the longer sides, one of which (the east) opened upon the Via Flaminia (the modern Corso), while the western opening, which appears to have been the principal one, led to the Campus Martius, and was approached by a flight of five low steps, with 5 in. rise and 9 in. tread, intended, no doubt, for the animals to be led up to sacrifice. It is with the remains of this enclosure wall that the main interest of the monument is connected, for the blocks of which it is composed are carved upon both sides and bear reliefs which are probably the finest effort of the art of the Augustan period. On the outside above is a frieze with figures, which is the most important part of all, while the lower half of the wall is occupied by extremely fine decorative foliage; on the inside the upper half of the wall has a frieze of festoons of fruit and flowers suspended from ox skulls, while the lower half seems intended to represent an enclosure of planks—perhaps the temporary fence that was built round the altar at the time when the first sacrifice was offered at it.

The outer frieze of the upper half of the wall is, as has been said, by far the most interesting. Upon the north and south sides are two processions, going towards the main (western) entrance to the enclosure.

In the northern procession we recognise the personification of the magistrates, senate, and people of Rome; in the southern, Augustus and his family and the chief dignitaries of the state.

The spaces available upon each side of the doors on the east and west walls are, naturally, smaller than those provided by the unbroken north and south walls. On each side of the principal entrance were reliefs, one representing Tellus, the Earth, with personified representations of the breezes on each side of her, the other a sacrifice of a sow to the deity. On the east side the reliefs representing the sacrifice of oxen are probably to be placed.

The history of the monument has been a curious one. Portions of its reliefs were found on three separate occasions in the XVIth century and have been much dispersed, so that they must be sought in

* Until the recent excavations it had been supposed that there was but one doorway on the east.

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the Louvre, at Vienna, at Florence, in the Villa Medici at Rome, and in the Vatican. Another group of fragments was brought to light in 1859, and remained in the palace which is built over the site of the altar, the Palazzo Fiano, until 1898, when the Italian Government bought them and placed them in the Museo delle Terme.

But it was not until 1879 that a German archæologist, Professor von Duhn, succeeded in determining that all these scattered fragments belonged to one and the same monument, with the help of drawings of the reliefs which had been made before their dispersal* (the most important of which drawings are in the British Museum, to which they came only two or three years ago after the death of Sir Augustus Wollaston Franks). Since that date they have been the subject of study by Professor Petersen, the head of the German Archæological Institute of Rome, who published in 1902 a detailed monograph on the subject.† The appearance of this work, with its appeal for a further and final excavation of the remains, has impelled the Italian Government to undertake the task of bringing to light the rest of the reliefs and of investigating more carefully than had been done hitherto the site itself. The work began last summer, and has already led to the discovery of several important fragments, and, more than all, of the base of the wall itself, at the level of the doorways, from which archæologists can at last derive a secure basis for reconstruction. Professor Petersen's theoretical arrangement of the reliefs and reconstruction of the monument, though it does him the greatest credit as an archæologist, has had perforce to be modified in certain points (*cf.* his article in *Römische Mitteilungen*, 1903, p. 164). The core of the altar itself has also been found.

The work is carried on under considerable difficulties, as the Roman level of the Campus Martius is now some 5 ft. below the modern water level; but it is to be hoped that the task of extracting what remains will be carried through, expensive though it will undoubtedly be, owing to the necessity of keeping pumps constantly going and of carefully underpinning the foundations of the palace above. If those fragments of the reliefs which are in other hands can be secured by the Italian Government, it will be possible, after the present excavations are completed, to reconstruct the whole monument (not on the spot, but in some more suitable site above the modern ground level) with a fair degree of certainty; and friends of Italy would see a coincidence of good omen for the future in the re-erection in the capital of united Italy of the Altar of Peace erected by the first Roman Emperor in the capital of his dominions.

THOMAS ASHBY, JUN.

FORM OF CONTRACT FOR SUB-CONTRACTORS.—We understand that the Institute of Builders recently took in hand the preparation of a form of contract for the use of sub-contractors, and that they have produced a document which will be of considerable service to the trade.

* *Miscellanea Capitolina* (Rome 1879), p. 11; *Annali dell' Istituto*, 1881, p. 302.

† *Ara Pacis Augustæ* (Sonderschriften des Oesterr. Arch. Inst. in Wien Bd. II. 1902).

NOTES.

Concrete-Steel Design.

NOW THAT concrete-steel construction is beginning to be extensively adopted in this country, it may be useful to refer to one or two points which should always receive careful attention by designers. In the first place it is very important to remember that, as a general rule, the manufacture of the material as a whole is concurrent with the erection of the structure; consequently, no opportunity is afforded of testing the material as there would be in the case of a bridge built in the contractor's yard. Probably the best means of insuring failure would be to entrust excessive responsibility to a building contractor or some other person who is not properly qualified to settle the proportions and distribution of the reinforcement, or to decide the most suitable method of mixing and applying the concrete. In every case the concrete used in concrete-steel construction should be of considerably better quality than that employed in ordinary masonry. Its constituents should be of better quality, and greater care should be taken in mixing. Particular care should also be taken to thoroughly enclose the reinforcement, so as to make an absolutely continuous joint. It is not always necessary that the concrete should be rich, but the greatest care must be taken to see that all voids are properly filled with cement so as to secure the existence of a solid and homogeneous mass in which the steel bars may be firmly held without risk of sliding. All architects who propose to avail themselves of the advantages of this new material should pay particular attention not only to the design of all details, but also to the supervision of the building contractors, who in most cases are unaccustomed to special work of the kind.

Electricity in Mines.

THE report recently issued by a departmental committee of the Home Office on the use of electricity in mines is a very valuable one. The committee have evidently closely studied American and Continental practice, and their criticism is always well informed. In America a direct-current system of supply is generally adopted for providing the power for the coal-cutting devices and for lighting the mines. Electric traction is also widely used, and this perhaps explains the preference shown for direct current. On the Continent alternating-current polyphase systems are generally used, and as polyphase motors can operate without commutators or slip-rings they can be used with absolute safety in fiery mines. The drawback to their use is that the various tools employed generally work on a very intermittent load, and therefore the motors which drive them are being continually started and stopped. Under these conditions the efficiency of polyphase motors is much less than that of direct-current motors. When there is any danger of gas electric locomotives cannot be used, the sparks from the trolley-wheel or the rails being obviously inadmissible. It seems to us that this is a case where some of the several alternating-current magnetic systems of traction could be applied with advantage. The report dwells on the arduous nature of miners' labour. "They have to lie for hours under masses of coal which, if they fell, would crush or severely wound them." A large proportion of the yearly roll of mine accidents is due to this cause. When an electric coal-cutter is used the chances are that only the machine is damaged when a fall occurs. Every application of electricity to diminish the severity of the miners' daily toil is welcome.

American Engineering Schools.

IN view of the proposals made this year to found a large central technical institute in London, the paper on "Transatlantic Engineering Schools and Engineering" recently read by Dr. Mullineux Walmsley to the Institution of Electrical Engineers is of general interest. The paper gives the result of a tour of inspection of the schools and colleges in the United States and Canada. It also describes interviews with many manufacturers and professional men, and the collection of statistics concerning the endowments of teaching and research in connexion with engineering are valuable The attitude of American manufacturers towards technical colleges seems quite different from that of the majority of English manufacturers. This is probably due to the practice of taking premium pupils in this country. In America many of the best firms will only give appointments on their technical staff to men who are college graduates or who have had a regular four years' training at a technical institute. The General Electric Company, for example, to take a case from amongst many others, take into their testing department alone nearly 300 college graduates every year. Every man employed gets a minimum wage of thirty-five shillings a week from the start, and if the man proves competent, his salary rises rapidly. We do not wonder that ambitious Englishmen and Germans often go to America for their technical training. Many of the professors at the technical colleges are allowed to practise as consulting engineers. This keeps them in touch with the latest developments of industrial progress. On the other hand, much of the routine work of teaching is left to underpaid assistants, just as it is in many colleges in this country. In our opinion, elaborate apparatus and costly tools are not the test of the usefulness of a college. The real test is whether the assistant teachers are competent or not. Dr. Walmsley was much struck by the large amount of post graduate research that is done in the United States. We believe, however, that this kind of research would be best done in a central technical institute for doing commercial testing on a large scale. This would keep the research graduates in touch with the actual requirements of commerce and would prevent a great deal of that laborious research into matters of no theoretical or practical importance often made by graduates at the older universities in this country.

Sanitation in Rural Districts.

THE recent deputation of the Rural Housing and Sanitary Association to the President of the Local Government Board emphasises what has been constantly stated in these pages that in

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regard to rural sanitation it is the men and not the measures which need reform. As Mr. Long said, pressure should be put on those responsible for the administration of the law, because he believed that the existing laws were to some extent sufficient to meet the evils of which complaint was made. But if the local authority is apathetic, the most energetic official is handicapped, since it is only by having the force of the local authority behind him that a sanitary inspector can compel his recommendations to be carried through. The more therefore that those who take a true interest in local affairs obtain representation on district and other councils the more likely are sanitary reforms to be undertaken and the law executed. Mere philanthropy, grumbling, or expostulation is little use; action on local bodies is the only real remedy for existing shortcomings.

Drainage of Low-lying Buildings. AN interesting decision on a little-known section of the London Building Act 1894 was given by the Divisional Court in the case of Ellis *v.* London County Council (current Law Reports). Section 122 provides that it shall not be lawful to erect any building to be used as a dwelling-house upon land of which the surface is below the level of Trinity high-water mark and which is so situate as not to admit of being drained by gravitation into an existing sewer of the Council, except with permission of the Council. The appellant, who had been convicted by the magistrate, had erected his houses at Charlton on land situated about 7 ft. below Trinity high-water mark. Provision was made for these houses to drain into a sewer which in its turn was led into a main outfall sewer. There was a fall of 5 ft. 6 in. from the houses to the sewer, but at its junction with the outfall sewer an automatic flap was fixed which, when the outfall sewer was flooded, prevented the flow of sewage from the other sewer. The Divisional Court held that the conviction was wrong, since in fact there was a sufficient fall into the first sewer to admit of the houses being drained by gravitation, and that the artificial closing of the outfall sewer, by its being put to a particular use by the Council, was not within the operation of the section.

Tramway and Highway Authorities. THE London United Tramways Company has abandoned nearly all its extensions, including that from Hounslow to Maidenhead *vid* Slough, on the ground that the demands of the local authorities are unreasonable. That tramway companies and local authorities are unlikely to agree on these points is certain. It is impossible to say whether the local authority or the tramway company is right as regards the amount to be spent. Thus, between Brentford and Ealing the Company was prepared to spend 13,536*l.* in street-widening, but the Urban Council required further work at a further cost of 7,000*l.* There seems, however, a good deal to be said for the demands of the local authorities when we hear of width of highways. The Bucks County Council required a road to be made, or, rather, the existing road to be widened, so as to be 80 ft. in width. In other words, there were to be two tracks, one for the tramway, the other for vehicles and foot-passengers. The width does not seem excessive, for in the country these so-called tramways are really light railways, and there should be ample room for all classes of traffic. A tramway company naturally likes to take as little extra ground as possible, but highway authorities are bound to protect ratepayers and to look to the traffic of the future as well as of the present.

A Canadian Irrigation Scheme. AN enterprise about to be commenced in the province of Alberta, Canada, is one of the most important irrigation works hitherto undertaken, and its effect will be to add a tract of some 3,000,000 acres to the cultivable land of the Dominion. Irrigation in Alberta is by no means an experiment, for there are already 400 miles of irrigation canals and waterways. Hence there is every reason for believing that the project will be thoroughly successful. Water will be derived from the Bow River, rising in the Rocky Mountains, and the first work to be undertaken is the construction of a main canal twenty miles long and some eighty-five miles of distributing canals, sufficient altogether to irrigate an area of 300,000 acres and to render available for grazing and dairy farms an adjoining area of 400,000 acres. The remaining part of the work will include the extension of the main canal, the construction of storage reservoirs, and the construction of a second large canal for use as a feeder to the irrigation system. By these means 1,500,000 acres will be made suitable for cultivation, and an equal acreage for grazing and dairy purposes. As the result of preliminary surveys, it is estimated that about one-half of the entire area can be irrigated at a cost of less than 1,000,000*l.* The land in question is traversed by the main line of the Canadian Pacific Railway Company, by whom the works will be carried out, and there can be no doubt that in a few years it will become one of the most productive and prosperous regions in Canada.

The Engineering Standards Committee. WE publish elsewhere in this issue a *résumé* of the work actually accomplished to the present date by the Engineering Standards Committee, but this summary gives a very inadequate idea of the large amount of preparatory work performed. In addition to the financial support of the leading engineering institutions, railway companies, and engineering firms, the organisation is indebted to the generosity of His Majesty's Government. The amount of the Government grant for 1904-5 has been made dependent on the amounts contributed by the industries affected, and it is very desirable that this condition should be widely known, so that the valuable work being done by the Committee may not be hindered or curtailed for want of funds.

Royal Academy Lectures. DR. MURRAY, we regret to say, was too ill to be present to give his concluding lecture on the Niobide group at Florence, which was read for him by Mr. Arthur Smith. He commenced by reference to the description of Niobe in Homer, and the legend of her being seen as a stone figure weeping on a lonely mountain—the ideal referred to by Byron where he calls Rome "The Niobe of Nations"; but the Niobe of the artists was at the moment of the catastrophe, when she and her children were slain by the arrows of Apollo and Artemis. In sculptural treatment of such a subject either the two deities must be the leading figures or they must be absent and Niobe the central figure. From about 400 B.C. (the date of Skopas) the latter was the adopted treatment, and it had been supposed that the well-known but incomplete group now at Florence was, or represented, the work of Skopas. Pliny doubts whether it was Skopas or Praxiteles who executed a Niobe group; Dr. Murray believes that it was Skopas, but it did not follow that the group at Florence was the original work. The originals were brought to Rome as spoils of war by a Roman Legate in the first century. The Florence group was discovered at Rome in 1583, near the Lateran, at the opposite side of the city from where the originals are said to have been placed; the figures were set up in the Villa Medici garden, and in 1775 removed to Florence. There were various known ancient copies of single figures of the group; one of the right-hand group found at Soissons; one of one of the daughters in the Vatican, and superior in style to the figure at Florence. The existence of a number of copies reduces the chance that any one of them is the original; and, as Dr. Murray showed later in the lecture, the workmanship shows, in the drapery especially, the comparative commonplaces of technique which are almost certain indications of Græco-Roman work. Yet it no doubt represented a Greek original, and there was much in favour of thinking that original to have been the work of Skopas. The heads bore the same characteristics as an undoubted head by Skopas (of which a cast was exhibited)—great depth in the hollow of the eyes and prominent definition of the eyeball. Another point was the lengthiness of proportion of the figures, those of the sons especially. Now, it was known that Skopas executed part of the sculptures of the Mausoleum, and among the Mausoleum reliefs were figures with the same quality of lengthy proportion; also the peculiarity of one of the figures having its back turned to the spectator was found in five instances in the Mausoleum reliefs. They could feel sure it was not by Praxiteles, for they had the Hermes to compare it with; but there seemed a good deal of reason to accept it as a copy from Skopas. In regard to the supposed scene, the old legend was that the sons were slaughtered by Apollo on the hill side, and the daughters subsequently at home by Diana; but the artist must have the action combined, and the indications of rocky ground showed that the whole scene had been imagined by the sculptor as in the open air. The varied heights occupied by the figures, with the existence of one figure lying down (probably balanced by a similar one at the opposite side), left little doubt that the group had filled a pediment, with Niobe and the child as the central group. The arrangement of the other figures was conjectural; but it could not be supposed that any sculptor would arrange all the daughters on one

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side of the centre and all the sons on the other, and the arrangement now made seemed probable, which showed the daughters hastening towards the mother in the centre and a wildly gesticulating group of the sons in the rear rushing up to protect the women. Probably this would have been balanced by a similar group on the other side, the figures of which are lost.

The Lyceum Theatre. IT is stated that Mr. Bertie Crewe has been appointed architect for the rebuilding of the Lyceum Theatre as a music-hall, and that the works will be begun forthwith, leaving nothing of the present fabric with the exception of the portico in Wellington-street, the back wall in Burleigh-street, and a side wall of the auditorium. The Lyceum was opened for English opera on July 14, 1834, having been built for S. J. Arnold by Grissel and Peto, at a cost of 35,000*l*., from the plans and designs of Samuel Beazley, who had been the architect also of its predecessor, erected in 1816 at a cost, it is said, of 80,000*l*., and burned on February 16, 1830. The site of the former Lyceum was shortly afterwards taken for the making of Wellington-street as an approach to Waterloo Bridge. Beazley built a new green-room in 1838, and a suite of rooms entered from Exeter-street for the "Sublime Society of Beefsteaks." C. J. Phipps carried out some alterations of the house thirteen years ago, including new entrance and exit doors, and an enlargement by taking in the two restaurants on either side of the front in Wellington-street. The freehold property, which includes six adjoining premises in Exeter and Wellington streets on a site of about 23,500 ft. superficial, was offered by the directors for sale at auction on April 23 last year, but was bought in at 260,000*l*. The shareholders were unwilling to expend 15,000*l*. or more upon certain structural changes required by the London County Council. The particulars of Sir William Emerson's award in the arbitration before him, as between the proprietors and the Council, will be found in our number of July, 12, 1902. A plan, and an interior view of the present house, are published in *The Builder* of October 16-23, 1847.

Torquay Public Library Competition. THE designs for the proposed Carnegie Public Library and Municipal Buildings at Torquay are to be sent in next Monday, March 7. One of the competitors sends us a printed circular from the Town Clerk, dated February 17, but which he says he only received on February 25, and which contains among other things the statement that "no opening lights or windows may be put in the building so as to give or open upon the adjoining property within a distance of 15 ft. therefrom." This is a stipulation which may of course affect the whole planning of a building, and to send it to competitors as late even as February 17 is most unfair; it may mean re-arranging and re-drawing the plans. It seems that an assessor has already been appointed who is supposed to be advising the Corporation; what has he been about to allow them to do this?

LETTER FROM PARIS.

THERE are many candidates for the position formerly held by Gérôme at the Académie des Beaux-Arts, but M. Carolus-Duran seems to be the favourite. The other candidates are MM. Gabriel Ferrier, Albert Maignan, Schommer, François Flameng, Toudouze, and Tony Robert-Fleury, the new President of the Société des Artistes Français (Old Salon). The latter will probably not get sufficient votes in respect of his artistic talent, but his personal quality will count for a good deal.

It is proposed to erect in the Palais Royal Garden a monument to Gustave Larroumet, to be designed by his son-in-law, M. Roussel. It is to consist of a stele, decorated with a relief figure of Minerva, with a portrait bust on the top of the stele. There is a proposal also to place a monument to the dramatic critic Sarcey, as a pendant to that of Larroumet.

The new Armenian chapel designed by M. Guilbert, the architect of the Bazaar Memorial Chapel in Rue Jean Goujon, is to be opened shortly. It will be decorated internally by mural paintings in an Oriental style, by M. Leroy, who has chosen for his subject "The Vision of Ezekiel."

M. Paul Meurice, the friend of Victor Hugo, and the organiser of the Hugo museum in the house once occupied by the poet on the Place des Vosges, proposes to memorialise the Paris municipality to transform the Place into a kind of monument of literature, by filling it with statues of authors of the Romantic School. According to his scheme, we are to see grouped in the middle of the lawn the statues of Balzac, Lamartine, de Musset, Alfred de Vigny, Chateaubriand, Georges Sand, etc. This is to be, in fact, a kind of "Poet's Corner" of Paris, and the idea has been very favourably received by men who are eminent in literature, science, and politics.

The Carnavalet Museum has received an interesting addition to its historic contents in the shape of the cradle originally made for the Prince Imperial, which the Empress Eugénie has offered, through her secretary, M. Pietri, to the City of Paris. This cradle, executed after the design of Baltard, the eminent architect, cost 160,000 francs. It is in rosewood, and in the form of a ship, with an eagle with wings outspread, executed in solid silver, at the prow; on the poop is a statue, also in silver, representing the City of Paris, holding aloft an Imperial crown, from which falls a lace curtain. M. Simart modelled the sculpture, and M. Hippolyte Flandrin designed the enamel work. It is altogether a remarkable work of art, and quite in its right place in the Carnavalet Museum.

At the École des Beaux-Arts the competition for decorative composition has just been decided. The subject given was "The Base of a Decorative Mast," and the prize has been awarded to Chialiva, a pupil of M. Bernier. At the "Union des Femmes Peintres et Sculpteurs" the first prize has been awarded to Mdlle. Chauchet, the prize in sculpture to Mme. Brach, that in decoratif art to Mme. Jeaunière, and that in miniature to Mme. Richard. The exhibition organised by the Union Syndicate des Peintres et Sculpteurs has been opened at the Petit Palais, but presents little that is of interest.

The women students have scored a fresh success at the École des Beaux-Arts, Mdlle. Rondenay having obtained the prize in the Concours d'Attainville and been classed first in the "Concours d'Après Nature" among the candidates for the Prix de Rome. This lady has, therefore, a very good chance of gaining admission to the Villa Medici.

Under the arrangements made by the new Directeur des Beaux-Arts, M. Henry Marcel, the château of Malmaison will soon be open to the public. It is intended to present a faithful restoration of the condition of the château at the time when it was Napoléon's favourite abode. A great deal of old furniture, ornaments, and textiles, selected by Josephine, have been got together from various national museums and palaces, especially Compiégne and the Trianon.

The "Vieux Paris" Committee has been recently visiting the interesting relics of the Gallo-Roman period which have been discovered in the labyrinth of small streets between the Collége de France and the Ecole Polytechnique. Three fragments of an ancient walling, among them a large circular wall of which the whole circuit is to be traced, have been discovered about four mètres below the present surface. It was through this part of Paris that there passed the ancient Roman aqueduct bringing the waters of the Rungis; and in the IIIrd century the side of the hill then called "Mons Lucotitius," and, later, "Montagne Ste. Genévève," was covered with habitations and public buildings. If is, therefore, hoped that the exploration, which will be continued, may bring to light other interesting remains.

At the first banquet of the new "Société du Nouveau Paris," which took place in February, under the presidency of M. Frantz Jourdain, President of the Society, this gentleman, in an interesting speech, pointed out the principal objects for which this society was formed. He affirmed that this society of artists was quite as respectful of the old monuments, which are the artistic richness and embellishment of the capital, as the members of the "Vieux Paris" committee. The new society had no intention to demolish any of the beauties of the city, or to transform Nôtre-Dame into a workshop. What the "Nouveau Paris" desired was the renovation and the sanitation of the old quarters of the town, and to do away with the unhealthy and impracticable streets without beauty, which still existed. M. Jourdain stated that the various societies which aimed at the preservation of the vestiges of passed ages, unfortunately always protested against any schemes for the embellishment of the capital, and he referred to the difficulties brought up by the Commission du "Vieux Paris" committee of that time against the formation of the Place de la Concorde, and the more recent protests made by the existing committee against the formation of the Avenue Nicolas II. M. Bouvard, director of the Services of Architecture of the town of Paris, who represented the Prefect of the Seine on this occasion, assured the young society that it would have on its side all the helpful efforts of the municipal administration, and M. de Tizac, representing the Minister of Fine-Arts, pointed out to the members some of the improvements already made and to be made, and gave them his assurance that the minister would aid their efforts.

The Paris Municipal Council, when voting at its last meeting the future arrangement of the grounds of the Champ de Mars, added that a portion of this ground should be reserved for "habitations à bon marché." But this portion of the vote met with the disapproval of the Prefect when he transferred the vote to the Minister of the Interior. In order to come to some determination the minister has appointed a commission to examine the votes and opinions of the members of the Municipal Council, and it will only be after the adoption of the proposition of the Council regarding the economical dwellings, or its rejection, that the setting out of the grounds and the commencement of the building work can be put in hand.

The Société Nationale des Beaux-Arts has appointed the following officers for 1904:—President, M. Carolus Duran; Vice-presidents, MM. Roll, Rodin, Waltner, Bésnard,; secretaries, MM. Béraud and Billotte; and treasurer, M. Dubufe.

At the next meeting of the "Société des Amis des Monuments Parisiens," the following questions will be discussed: Modern Paris; the lighting of the Avenue des Champs Elysées; the newly-discovered basement of the Louvre; the demolishing of the Caserne des Celestins; and the aspect of the quays of the Seine since the 1900 Exposition.

The death is announced, at the age of fifty-six, of the painter-engraver Bertrand, who was a pupil of Cabasson and of Pannemaker *père*. For many years he exhibited at the Salon engravings on wood, and contributed not a little to revival of this art in France. He leaves a great deal of important work in the shape both of original engravings and reproductions. In the last Salon his engravings in black and white and in colour attracted much attention.

BATHS, LIVERPOOL.—The Chairman of the Baths Committee and the Chief Superintendent recently visited London for the purpose of instructing the architect, Mr. Snell, to prepare sketch drawings of a scheme for baths on the George's Dock site, to cost not more than 60,000*l*. These have now been submitted to the Committee, who have resolved that the Chief Superintendent arrange for complete sketch drawings, showing elevations, etc., to be prepared. Tenders have also been invited for the erection of baths at Picton-road.—*Liverpool Mercury*.

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THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL general meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, W., Mr. Aston Webb, President, in the chair.

The business of the meeting was the election of the Royal Gold Medallist for the current year. The chairman moved, and it was carried *nem con*, "That, subject to His Majesty's gracious sanction, the Royal Gold Medal for the promotion of architecture be presented this year to M. Auguste Choisy, Inspector-General in the Service des Ponts et Chaussées, Paris."

The ninth general meeting (business) of the session was then held, when a vote of regret at the decease of Mr. Percival Gordon Smith and condolence with his relatives, was passed.

The following gentlemen were then elected as Fellows: Messrs. A. E. Bartlett, London; T. Cooper, Birmingham; B. F. Fletcher, London; S. F. Harris, Northampton; Arthur Keen, London; C. R. Hall, London; F. M. Kent, Pietermaritzburg, Natal; H. W. Johnson, Market Harborough; A. H. Parker, Worcester; As Associates: Messrs. H. W. Asman, Bradford; L. L. Bright, Nottingham; M. N. Castello, Sydenham-hill, S.E.; H. W. Cubitt, London; W. R. Davidge, London; W. J. Delbridge, Greenwich, S.E.; G. Dykes, Junr., Hamilton; H. T. Fowler, Barrow-in-Furness; H. Griffiths, London; E. G. H. Gunn, London; W. Hemingway, Bolton; H. W. Hobbiss, London; F. G. Johnson, Risca, near Newport; J. S. Lee, London; H. B. Mackenzie, London; F. W. Newman, Hampstead, N.W.; H. M. Pritchard, Cardiff; T. H. Robinson, London; A. Rollo, Westminster, S.W.; G. L. Russell, Hackney-common, N.E.; H. W. Stone, Birmingham; J. J. Wood, Leeds.

As Hon. Corresponding Member: Glenn Brown, Washington, D.C., U.S.A.

Resolutions as follows were then passed:—

That the necessary alterations to the by-laws be drafted and submitted to a special general meeting to provide that after December 31, 1906, every person desiring to be admitted a Fellow shall be required to have passed the examination or examinations qualifying him as an Associate, or shall be elected from the ranks of the Associates; but that, in exceptional circumstances, the Council shall have power to dispense with such examination or examinations.

Further, that during the intervening period, every architect eligible under the charter for election who desires to join the Institute as a Fellow should be encouraged to do so.

The Council also submitted the following amendments to the "Suggestions for the conduct of architectural competitions":—

Clause 2 (*a*) to read as follows:

"To draw up the particulars and conditions (as far as possible in accordance with the principles herein set forth) as instructions to competitors, and also to advise upon the question of cost and the amount and apportionment of the premium or premiums.

Note.—In drawing up the instructions it is desirable to divide them into two distinct classes:

(i.) *Conditions—i.e.*, those which must be strictly adhered to.

(ii.) *Suggestions—i.e.*, those which are merely optional or of a suggestive character."

Clause 7: Delete entirely.

Renumber clauses 8, 9, 10, 11, as 7, 8, 9, 10 respectively.

Clause 12: Delete all first paragraph and renumber the second paragraph, beginning "It is essential . . ." as clause 11.

Add the following clause as the new clause 12:—

"The author of the design placed first by the assessor or assessors should be employed to carry out the work, and he should be paid in accordance with the Schedule of Professional Practice as to the Charges of Architects sanctioned and published by the Royal Institute. If no instructions are given to him to proceed within twelve months from the date of selection, or if the proposed works are abandoned by the promoters, then the selected architect should receive payment for his services in connection with the preparation of the competition drawings of a sum equal to 1½ per cent. on the amount of the estimated expenditure."

These amendments having been passed,

Mr. H. Hardwicke Langston asked the following question: Is it in the power of the Council to say whether it is the intention of the Registration Committee, in view of the great interest attached to the movement for the statutory qualification of architects, to take a poll of the members of the Institute upon the general principle involved?

The President stated that he was unable at present to answer the question as the Committee had not met yet.

THE SURVEYORS' INSTITUTION:

BRITISH TIMBER AND ITS USES.

AN ordinary general meeting of the Surveyors' Institution was held on Monday evening last week at No. 12, Great George-street, Westminster, Mr. A. Buck, President, in the chair.

The minutes having been read and confirmed, and some donations to the library and the library fund having been announced,

Mr. H. J. Elwes, F.R.S., read a paper on "British Timber and its Uses." After some preliminary remarks he said that in the days when we relied upon our own timber for nearly all local uses, and when the production of oak timber for house and ship building, ash and elm for waggon building, pit wood for mines, and underwood for hop-poles, fencing, hurdles, and firewood, was the main idea which governed landowners, a system of managing woodlands was developed which at the time was no doubt the best from an economic point of view. At that time local builders, carpenters, coach-builders and furniture-makers were ready buyers of almost all kinds of timber, and kept stocks of timber to season properly because they could not carry on their trades without it. Much of this timber was no doubt more difficult and expensive to select and to work up than foreign timber, because it was often grown on land which our ancestors had not thought good enough to cultivate. But even on good land one would not expect hedgerow timber, or timber grown in open woods, where underwood was a regular crop giving a certain annual return, to be as clean and straight and suitable for building purposes as timber grown in dense forests of great extent, from which only selected trees were exported. In consequence, architects had in many cases stipulated that only foreign timber should be used, and even trades such as the High Wycombe furniture factories, which had been founded and developed on purely local supplies, had gradually taken to foreign timber to a great extent, and in consequence the demand for most kinds of home-grown timber, especially when of small size, had fallen off, and underwood was in many districts only saleable at a price which left little or nothing for the rent of the land when all expenses were paid. Iron fencing hurdles and wire netting had largely superseded wood. Open hearths suited for burning faggots had almost disappeared from our modern labourers' cottages, and as long as coal remained cheap a great deal of wood was hardly worth carrying away unless close to a market. At the same time that this state of things was growing up the preservation of game became much more general, and shooting, which was formerly confined to landowners and their friends, had become so popular a sport that it was now much easier and more profitable to let inferior land for sporting than for agricultural purposes. One of the great difficulties one had to contend with was to find men at a reasonable rate of salary who were really competent to carry out a plan of operations which, after long and careful consideration, had been determined on as most suitable for any particular district. A serious drawback to the use of English timber was caused by the rates charged by railway companies for carriage, which in many cases were much higher than those charged on foreign timber, especially pit wood and deals. It was the general opinion of English timber merchants that both the system of measuring adopted by the railway companies and the rates charged operate very unfairly on British timber. As the railway companies were in many cases the best customers of the timber merchants, those merchants were often unwilling to fight them on the question of rates. The loss therefore fell entirely on the landowner, because the price offered by the merchant must always be based on the cost of getting the timber to market. Another matter was the question of rates and taxes; the system of taxing and rating woodlands was grossly unfair, and it was surprising that it had been allowed to grow up.

In the hope of inducing agents and landowners to turn over some portions of their land to the unchecked operations of timber culture, he ventured to suggest a few ideas. We have in England a great variety of soils and climates, capable of growing to a very large size many kinds of trees which are not indigenous. Some of these when planted with due knowledge of their requirements, and with the object of producing timber rather than for ornamental purposes, would, he believed, be more profitable than the common timber trees. He had been much impressed by the general unwillingness of timber merchants to recognise as valuable timber some of the trees which he was going to talk about, and it was no use planting them as forest trees if we could not educate the public to believe in their value by showing them in use, and so create a market for them. He had collected a number of specimens, some of which he showed in order to give an idea of the immense variety of trees there were which grow to timber size, and to the nature of their wood.

The amount of waste which goes on on all estates by allowing trees to grow too far apart, by allowing them to stand long after they are mature, and by planting them without regard to their individual requirements as regards soil and position was very great. Many landowners generally considered it almost a crime to cut a tree until it was half dead, and the fate of many of the most valuable trees was to die standing or to be blown down, and eventually find their way to the bothy fire or the log heap. A friend of his recently panelled a room at a cost of 700*l.* with so-called Italian walnut when he could probably have found a tree on his own estate that would have done the work equally well at a quarter the cost.

He had seen houses where thousands had been lavished on internal decoration with foreign wood not so good as could be done with timber off the estate if only the knowledge to select it existed and time were allowed to season it properly. Where could modern panelling be seen equal to what our ancestors did with their own oak?—of which the dining-room at Gilling Castle, near York, is one of the most beautiful examples he knew; and yet we saw Austrian and American oak, pitch pine, and other inferior, though perhaps not cheaper, woods commonly used at the present time.

The author then referred to various trees which were included under the heading of British timber. Oak was one of the most valuable trees we have, though it took longest in coming to maturity. Its value had fallen owing to large importations from Austria, which had now superseded the so-called Riga oak. American oak was now also being used to a great extent on account of its lower price, though it was believed, by those who had most experience, to be inferior in strength and durability for railway waggon building. We have in some parts of England a form of oak known in the trade as brown oak, whose value for internal house decoration had recently led to a great increase in its price, principally caused by a demand from North America, to which country most of the best of it goes at very high prices. When the tree is felled before the timber has become rotten at heart it could be used with a beautiful effect, being much superior in colour to that of the foreign wood for panelling or cabinet-making; the latter was often made dark by fuming or staining, but did not have the same rich colour as good brown oak. More often the trees when felled were found partially hollow, and in such cases the soundest parts of them were cut into thick veeners or plating, because, owing to the liability of this wood to warp, crack, and twist, it was very expensive and difficult to use except in the form of veneer, and had to be laid on stronger and more reliable wood as a backing. Elm was one of the fastest-growing hardwoods we have, but it had a tendency to form large branches, which, if not pruned when young, often split the trunk before maturity. Ash was the tree which, in the opinion of most timber merchants, was the most profitable hardwood to plant wherever the soil suited it. The timber was now, when of good quality, worth more than that of oak; it grew nearly twice as fast. It was less exposed to foreign competition than any timber we have. It seeds itself more readily than any other English hardwood, except sycamore, and was worth money at a smaller and younger stage than any other hardwood except chestnut. It was a tree for which no substitute had yet been found, and one of the hardiest trees and less subject to disease or insect attacks than most, though in low-lying and damp spots it suffered from late spring frosts.

The author then referred to several other

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woods. Speaking of cherry, he said it was a tree whose value as timber was not recognised in the trade, though formerly much more used for furniture and cabinet making. It grew fast, straight, and clean on poor calcareous soils that would not grow many trees well. It attained a much larger size than was usually known, especially when drawn up by beech. He had seen trees in Surrey containing over 100 feet of timber, and had felled one on his own land 8 ft. in girth. Black poplar was another tree eminently suitable for growing in damp and water-logged situations, where it attained a great size in a short time, and though not a timber of much intrinsic value, and therefore not to be planted for profit far from a market, might bring a large return in a short time.

As to the conifers, larch was worth all the rest put together. Unfortunately we could not now grow larch as we used to do, partly, in his opinion, because the necessary care was not taken to select seed from healthy vigorous trees growing in a climate where the disease was not prevalent, as it was now in most parts of England and Scotland, and because the seed was not allowed to remain on the tree till thoroughly ripe. Larch was always saleable, and always likely to be wanted, both in small and large sizes, and the only source of foreign supplies which was likely to compete with our own was in the larch forests of the White Sea and Petchora districts in North Russia.

Scotch pine was a tree most suitable for sandy soils in the South of England, and for peaty soils in the North. Where it could be grown to a large size, and close enough to keep it clean and straight, it was a valuable tree, but its strength depends on the amount of redheart wood, which time alone will produce.

Spruce was the worst of all our common conifers from a timber point of view, and, notwithstanding what writers tell us, could very seldom be grown thick enough to keep it free from the branches which make English-grown spruce usually so knotty and weak. It was a valuable nurse for hardwoods where the soil was moist enough. Silver fir was a timber which was much more thought of in Germany than in England, and Douglas fir was the fastest-growing conifer we have.

The author then dealt with trees which, though not generally looked upon as forest trees, and as yet seldom planted except for ornament, would, he believed, if tried with a due knowledge of their peculiarities and requirements in the way of soil, climate, and treatment, be as valuable, if not more so, as some of those of which he had already spoken. No wise man would plant them largely for timber until he knew all that he could learn about them and until he had seen that they would grow on similar soil and in a similar climate to his own. His successors would also have to take the risk of their not finding a market for their timber equal to their actual value, and it might prove that some of them would develop defects with age which we could not now foresee.

Of hardwoods there were not many, and though most of them have been introduced for a long period, the rage for planting conifers, which sprang up about 1830 and which had not yet died out, had led to their being almost forgotten by modern planters. The first and the most valuable from a timber point of view was *Juglans nigra*, a black walnut. Though this tree did not come to a large size except on good deep soil in the warmer and drier parts of England, yet he had seen trees in Kent not over 100 years old which contained about 100 cubic feet of timber, and this was fully equal in colour to that of the American timber which was now becoming very scarce as large logs, and which was worth from 5s. to 7s. a foot, and likely to become dearer. Another was the American ash, of which there are several species. He had lately been making experiments with these, which in their own country were of equal value for the same purposes as English ash. They had the advantage that their seed germinated the year after it was ripe instead of lying a year in the ground, and a bed of American ash, which he sowed in June, 1901, escaped the severest spring frost, which cut off 90 per cent. of the English ash seedlings in the same nursery. This tendency to late growth had also been found very advantageous in Germany, where the American ash had been used for some years. It grew with great rapidity, and at Kew on poor dry soil, which would not grow first-class English ash, it was one of the most vigorous, healthy, and promising timber trees in the gardens. There are three species now in cultivation. The tulip tree was one of the most beautiful flowering trees we have, and it comes to a great size on deep, moist, heavy soil. Its timber was now very largely used for furniture and cabinet making under the name of "whitewood" or "canary wood," and was known as yellow poplar in the United States. Its great defect as a forest tree was the difficulty of establishing it when young, as it transplants badly and grows slowly at first. Though quite hardy, he should only recommend it for the warmer parts of England, as, like most American trees, it liked hotter summers than we usually get here.

The plane tree also produced excellent timber, which was very ornamental when taken from trees of some size and age. In France and America it was largely used for inside work, and the better parts were cut into veneer for decorative purposes.

Ailanthus glandulosa, a Chinese species, known as "tree of heaven," was another tree which grew to a large size, ripens seed in England, and produces excellent timber.

Sorbus domestica was a rare tree known as the service-tree, though quite distinct from the true service, *Pyrus torminalis*; it produced, at least in some cases, the most beautifully-waved timber he had ever seen of native growth. It was quite unknown to English timber merchants, but highly valued in France, where it was grown in some districts as a fruit tree.

Proceeding, the author said: "Among the conifers not generally treated as forest trees I will mention the following:—*Thuja gigantea*, the red cedar of British Columbia, of which I show a plank cut from a decayed tree in Devonshire, which, though a poor sample, is but the best I can get at present, also a specimen lent me by Mr. Turner, the Agent-General for British Columbia, which shows its true character. This tree grows rapidly on almost all kinds of soil, but is especially suited to damp climates and wet bottoms, where larch will not grow. I have measured trees over 70 ft. high and 6 ft. in girth at fifty years of age. I have never seen it injured by frost, insect attacks, or disease in any part of England, though it is said to be subject to a fungoid disease in some parts of Scotland. It stands close planting and dense shade. It is extremely easy to raise from seed, and I have raised thousands from trees growing at 700 ft. elevation on the Cotswold Hills. It transplants readily in spring or autumn. Its timber is so durable that a tree fallen in the forest, on the trunk of which a hemlock spruce has grown for over 150 years, remains sound, as shown by the photograph I exhibit. It makes excellent straight-grained shingles and boards, which are preferred to any other wood for interior work in British Columbia, and take a beautiful polish. It is admirably suited for telegraph poles and fence posts.

"*Cedrus Atlantica*.—The Algerian cedar has already proved its ability to grow on various soils in England, and is perfectly hardy on all parts of England. It has a much more erect habit, and is far less branchy and a faster grower than the cedar of Lebanon. It ripens seeds in good seasons in England, and can be procured at a cheap rate from French nurseries. It is not so easy to transplant as some conifers, but much easier than the Corsican pine. . . .

"*Cupressus macrocarpa*.—An extremely fast-growing and beautiful species, not perhaps hardy enough for the colder parts of the country, but a most valuable tree for the South and West of England, especially near the sea. In Sussex on poor soil I have seen trees 80 ft. high and 12 ft. in girth at about fifty years old. It ripens seed freely, and is easy to raise, attaining 3 ft. in height at three years old, whilst silver firs under similar conditions were only 3 in. . . .

"*Cupressus Nutkatensis*, often incorrectly called by nurserymen, *Thujopsis borealis*, is another tree from the coast region of British Columbia which on my poor limestone soil grows very freely, though not so fast as *Thuga gigantea*. . . .

"Of the Corsican pine I need say little. It has thoroughly proved its good qualities in almost all parts of England as a forest tree, especially on dry limestone soils. Its greatest defect is the difficulty of transplanting it, on account of its bad root system when young. . . . When planted in the autumn without special precautions, 50 to 90 per cent. often die. Its timber, when it is grown thickly enough to suppress branches without weakening the tree, is very good, and, being more resinous, is said to be more durable than that of many conifers. . . ."

In conclusion the author said he was now engaged on a work on the trees which attain timber size in Great Britain and Ireland in which he had the assistance of Dr. Henry, of Kew. They would be glad to receive and name, now or later, any specimens of wood or trees which the members, in the course of their business and pleasure, might meet with and think worthy of notice.

A brief discussion followed, in which Mr. R. Anderson and Mr. G. Craggs took part, and the meeting was then adjourned.

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.

On Monday last, 29th ult., Mr. George Trotman read a paper before this club on "Gloucester," illustrated by a large number of lantern slides.

Mr. Trotman commenced his lecture with an account of the Cathedral, showing the manner in which the Norman work had been cased and altered during the Perpendicular period, the photographs of the tracery inserted in the arches and of the vaulting being particularly interesting. The cathedrals of Worcester and Hereford were then compared with that of Gloucester, and an account of the churches, public-houses, and domestic buildings of Gloucester City followed. Several photographs were then shown of churches in the district exhibiting the peculiar Gloucestershire stone spires, very lofty and attenuated but withal graceful. The lecture concluded with an exhaustive description of the domestic work in the neighbourhood, many beautiful illustrations of the stone-roofed houses being shown, nearly all of which exhibited the Gloucestershire lack of valley gutters, the intersection of the roofs being protected by the carrying round of the stone tiles. Mr. Trotman showed how a general type of design was followed in nearly all the domestic buildings of the XVIth century, a gable being provided on each face and each pierced near the apex by a circular window; below this is a square-headed two-light window with label mould, below this on the first floor a square-headed three-light window with label mould carried round the building as a string course and on the ground floor a similar four-light window. Where the fall of the ground allows, a basement is formed with door in the centre and a two-light window on each side. The graceful proportions of these houses are largely due to the lowness of the rooms, which average 7 ft. 6 in.

Mr. G. H. Fellowes Prynne, in proposing a vote of thanks to Mr. Trotman, referred to the casing of the Norman work during the XVIIIth century and wondered what the public would say if a modern architect were to commit a similar act of vandalism. Continuing, he referred to the peculiar beauty of Worcester, which rendered it, above all other cathedrals, a place for the contemplative study of architecture.

Mr. W. Williams, in seconding, suggested that the reason why many Lady Chapels, that of Gloucester being no exception, were not axially in a straight line with their cathedrals, was symbolical of Christ's head leaning towards His shoulder when on the Cross. Mr. Williams concluded with an amusing description of a visit to Gloucester he had made with Mr. Trotman.

The discussion was continued by Mr. R. Wellbye and Mr. G. H. Lovegrove, and the vote of thanks was cordially agreed to.

LONDON COUNTY COUNCIL SCHOOL OF BUILDING, BRIXTON.

On Friday evening last week the new London County Council School of Building, Ferndale-road, Brixton, was opened by Sir William B. Richmond, K.C.B., R.A. The building was erected for a swimming-bath, and is said to have originally cost 20,000*l*. It was afterwards taken over for the purposes of the Brixton Polytechnic, which was conducted under private auspices and had a number of trade classes which were accommodated in the annexes surrounding the central building. Then the Lambeth Vestry purchased the building for public baths, but subsequently selected another site for the purpose, while local efforts were made to sell the building to the County Council for 4,000*l*. Eventually the Council took them over, and

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alterations have been made under the superintendence of Mr. B. E. Nightingale at a cost of 18,000*l*. The premises comprise the great hall, with an open floor space measuring about 150 ft. by 60 ft., in which the various trades can be brought together for combined building operations, and in which also it may hereafter be found possible to provide appliances for the testing of builders' materials and composite structures. In the annexe on the north side of the hall adjoining the railway are workshops opening directly out of the hall for plasterers, masons, and bricklayers, and it is proposed to convert a part of the annexe on the west side into a workshop for leaded glass. On the south side on the ground floor are a plumbers' shop, affording accommodation for nearly forty plumbers working at one time, an engine-room, boiler-room, and accommodation for electric-lighting plant and a metal workshop not yet fitted up, and class-room and drawing-office for building construction. On the first floor, leading directly off the gallery of the hall, are a joiners' shop, measuring about 50 ft. by 35 ft., a painters' and decorators' loft, and a large drawing-office for architectural work, from which a small class-room can be separated by a movable partition. The secretary's office, the principal's room, and the room for the accommodation of the teaching staff are provided in the house in Ferndale-road, which communicates with the School by a covered corridor. The premises also comprise about 18,000 sq. ft. of land available for building if and when the requirements of the School demand additional accommodation, and it will be possible on this land to provide class-rooms and laboratories for scientific study and research in connexion with materials used in the building trades or for other purposes, or classes might be arranged in connexion with any other local industry. The School, as now erected and equipped, may form the chief building-trade school in the South of London. Drawing, designing, modelling, and carving in wood and stone will be taught in connexion with the building trades, but the School will not comprise what is ordinarily known as a school of art.

Over 250 students have joined the School, and work of various kinds was being proceeded with on Friday prior to the opening meeting. A large number of interesting exhibits, chiefly of work done in other technical schools, was shown.

Mr. E. A. Cornwall (Vice-chairman of the L.C.C.) took the chair at the opening ceremony.

Sir William Richmond said he was extremely glad to see so many men present, because, although women were most useful adjuncts and supplied the place of one side of man, yet after all, if they wanted to make a thing move, the thing must be moved by men. He had been asked to speak that night, he supposed, because he was an artist who did not occupy himself only with painting upon canvas, but who had interested himself all his life in various trades and enterprises belonging to all crafts. He thought, in the first place, that there was nothing more weakening to either the personal or the national system of enterprise than mere specialism. The object of the County Council, so far as he could observe it, was to enlarge the views of education in this country and to put them upon even a higher footing than those occupied by continental nations. This had been a very difficult object and a very difficult motive power for the County Council to advance, because for years and years England remained behind, and there was little or no education for the masses. During the last fifteen years the London County Council, in the face of opposition, had proceeded upon a straightforward path, and with great courage had initiated a system of education for the people. When he said the people he meant the whole English race, for it was their industry which was the greatest security of the nation. He had journeyed in many lands and mixed with many peoples, and in a sense could call himself cosmopolitan, and when, after sojournings in Germany, France, Italy, Austria, and even Russia, he had come back to this country, he had seen a strong desire on the part of the people for education, but found they had been held. Now the moment had come when the people held the nut in their hands if they choose to crack it. It rested now with them to take up the opportunities which were offered, and he believed they would do so. Let them remember that in this very building enterprise for which that institution had been started there was enormous need for good work, for simple and delightful design, and for simple and beautiful workmanship—not necessarily ornamentative, but admirable for its purpose and admirable by view of its construction. There was a great Italian architect who said that architecture was composed of three first principles—utility, stability, and beauty. Unlike many modern people, he put beauty last. Why? For a very simple reason—because, if a thing was stable and useful in the real sense of the term, the chances were that it was beautiful. What he apprehended they had to do in that School was to examine all modes of building and building construction which would serve their purpose through life, but as an old hand he would recommend that in the first instance they should remember the word caution. Let them remember that in building, if the parts and the main parts of the building which struck the eye were not desirable and delightful, they might clap on ornamentation *ad infinitum* and never make a desirable building. What they all wanted to see in London was the doing away with the sham façade—with the façade which had no part and parcel with the great constructive elements of the building. What he would like to see taught in the School was that out of construction came all ornament. What was a Greek temple? A Greek temple was probably the most simple piece of construction that was ever invented. It was a series of columns supporting a roof; within it was the temple devoted to the purposes of divine worship. That was all, and yet for 2,300 years everybody almost had been talking about this wonderful art. Some had imitated it with the utmost futility in modern times. In London we have a strange climate. We have alternations of golden heat, rain and fog, and therefore the architecture for London to his thinking ought to be of the most dignified and simple kind. Projecting cornices and such-like were absurd; everything which caught the dirt was ridiculous addition to the building. Probably the best architecture adapted for London was that which they knew of as the architecture of the time of Queen Anne. He began by saying that they did not want to be specialists, and he would add that even those who were going to put themselves heart and soul into one trade would make their minds bigger and broader by taking advantage of the other kinds of education which the County Council provided. They must not allow themselves to get into grooves. A rich mind produced a rich product, and a poor mind could only produce a poor product. Sir William Richmond concluded by declaring the building opened.

A hearty vote of thanks was accorded Sir William on the motion of Mr. Hubbard, L.C.C., seconded by Mr. F. Dolman, L.C.C.

Sir William Richmond, in reply, advised the people to enlarge their educational facilities and limit the public-house licences. Let them say, "We will not be called the most industrious country in the world; we will *be* the most industrious."

MAHOGANY AND OTHER FANCY WOODS AVAILABLE FOR CONSTRUCTIVE AND DECORATIVE PURPOSES.

AT the eleventh ordinary meeting of the Society of Arts, held on February 24, at John-street, Adelphi, W.C. (Sir H. Trueman Wood, M.A., Secretary, in the chair), Mr. Frank Tiffany read a paper on this subject. Having referred to the depletion of the world's forests, and the need for the inauguration of an extensive and scientific system of reafforestation of the United Kingdom and Ireland, he said that the needs of general building were, in the main, well provided for with soft woods, but it was necessary to consider something beyond a mere granary—*i.e.*, the varied requirements of the architect, engineer and naval constructor, the railway carriage and coach builder, and those of the silversmith and cutler. The makers of fancy knick-knacks could utilise many beautifully fine woods which, on account of their small sizes, were not adapted for large constructive purposes. It was doubtful if wood, as an aid to constructive and decorative art, was appraised at its proper value in first-class building. Too often architects embodied in their original designs some charming features of woodwork, only to find when the tenders were submitted that the gross cost of the entire building was beyond the ideas of the principal or building committee. Then commenced the paring down, which usually resulted in the exclusion of high-class woodwork. It was to be hoped that in the proposed Liverpool Cathedral the blunder would be avoided of cutting down the wood at the expense of stone. The wealth of Liverpool should provide sufficient money to insure that every piece of wood shall be of oak or teak, either of which, if properly selected and manipulated, was almost imperishable and certainly more durable than stone.

With further reference to the "choice of woods," what could be more incongruous than a mahogany pulpit in a Gothic building, or to see drawing-room furniture made of oak? Certain woods were unsuitable for Chippendale or Sheraton furniture; for these styles Spanish mahogany was decidedly unique. Apart from style, there was also the question of the utility of a given wood for a specific purpose; thus, on the introduction of fine woods into the fittings and furniture of public buildings, offices, hotels, and steamers, where hard wear had to be stood, the architect should seek to procure such woods as would not readily indent or absorb the dirt and smoke incidental to the places named. To avoid these objections, it was necessary to choose woods which contain most of the essential features which give fancy woods their value. Briefly summarised, the salient features of what was required of any fancy wood was that it should possess more or less of the following attributes:—A hardness of surface, but it must not be of such hardness as to render it potty, or brittle, so as to be too difficult to tool; evenness of texture, that was an absence of undue variation of alternate layers; cohesion of fibre, along with an absence of resinous galls. It was also necessary that the wood would season more or less readily, without a tendency to tear itself into shreds, or to twist and warp, when seasoned; nor should it swell and shrink with every slight variation of atmospheric conditions. Colour and figure were points which allowed a considerable latitude of choice; it was, however, desirable, in high-class woods, that their colour should improve with age; it militated against value when they faded, got black, or became lifeless.

In cabinet-making glue played an important part; any wood which would not take glue was worthless for this class of work. It was also essential that a fancy wood should be capable of yielding a fine surface when polished; a wood which unduly absorbed polish was discounted. Many woods which possessed the attributes named lacked size; but those which had the essentials, combined with length and width, were invaluable in constructive and decorative art. An important point for the architect, before stipulating for any particular wood, was to learn if its specification would yield the sizes required; an iron girder could be made to any size, but, with an oak beam, its length and depth was limited to what the tree would yield.

There were three distinct woods, namely, mahogany, oak, and teak, each possessing such important characteristics as to justify the expenditure of labour in their manipulation, and so rank them as leading fancy woods. The commanding position of mahogany was not due to any mere freak of fashion, but to its own intrinsic merits, along with the abundance of supply; 30 ft. was not an unusual length, and the squares ranged from 12 in. to 50 in. Mahogany seasoned readily, with an absence of splitting and checking. Much of it was firm grown wood, not too difficult to tool. It was practically non-flammable; it was capable of a high finish in polishing, and as a groundwork for paint it was without an equal. Broadly, it could, with advantage, be used for almost every purpose of high constructive and decorative work. Speaking generally, the imports of Spanish mahogany—*i.e.*, St. Domingo and Cuba wood—possess the finest texture, and had, in a marked degree, those chemical constituents which caused the wood to mellow and improve in colour with age, giving them a charm which was distinctively their own. The supply from St. Domingo was now insignificant, and consisted chiefly of small chair-wood. The Cuban shipments afforded a good range of sizes, which fitted them for the highest purposes of constructive and decorative art. The wood was of firm, silky texture, without being too hard, and, when wrought, there was no tendency to warp. Much of it was only slightly figured; when richly figured it commanded high prices. The next mahogany in order of merit was Honduras baywood, especially the shipments from Belize and Trurillo. These came in larger sizes than Spanish wood, hence their greater adaptability for larger work. Their silky texture, along with a general freedom from serious heart shakes caused the wood to be much appreciated. In point of size, Honduras wood was excelled by

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the Tabasco shipments, the latter also yielding fine textured, good coloured wood, but the heart shakes were usually more serious. Mexican shipments were much softer, and frequently contained corky heart wood, but the supplies to this country were practically nil.

Nicaraguan mahogany was chiefly shipped in the round, was of mild texture, but the supply was insignificant. Panama mahogany, whilst it was of good texture, was subject to worms, and it came in such a shockingly battered condition that it only realised low prices, and the shipments were too erratic to give it a place. From Guatemala there was a nice quality of mahogany shipped, but the heart shakes were serious. Unfortunately, whatever might be the merits of the mahogany shipped from the Central American ports the quantities arriving in this country were diminishing. But this was compensated by the development—especially into Liverpool—of the African mahogany business. Although the character of this wood varied, it embraced timber which contained, in a marked degree, those characteristics which make for value. The quantity received was simply enormous, representing the product of different districts; the wood of each had its own utility.

The lecturer proceeded to classify these woods, after which he dealt with oak, which he called the king of hard woods grown in the temperate zone. The different varieties were so diversified in colour, density, and size, that it would be impossible within the limits of a paper, to bring out all the attributes of a wood which entered so largely into heavy constructive work, such as bridges, roofs, and the under-parts of rolling stock, all of which were subject to strains and stresses requiring a tensile strength and a flexibility not equalled by any wood known, even if its specific gravity was 40 or 50 per cent. greater. For church and other interior fittings, or for furniture, whether required for hard wear or for the highest decorative art, oak stood unrivalled; but the variety must be considered in relation to the purpose for which it was intended. For fine work with intricate details possibly the best available was the Austrian wainscot, which, owing to its large mild growth, seasoned without unduly checking and splitting; its evenness of colour rendered it invaluable. Crown logs were imported in billet form, clear of heart, and should have deep sides and a narrow sole, otherwise they yielded too much wood, narrow and without figure. Wainscot oak from Lebau and Odessa was of smaller growth and of a more dense nature, hence more apt to split and check, nor could they be produced as clear of heart as was not only desirable but necessary; they should be avoided in first-class work. The American equivalent term for "wainscot" was "quartered," and by this system of conversion all the boards or planks showed the figure on the face; the wood was shipped square edged, one edge with the sap on; the range of width varied from 3 in. to 18 in., but anything above 8½ in. average was special. There were so many dealers in cheap lines, that unless one knew the source of supply there was no guarantee as to evenness of colour, but the right stock was obtainable from reputable importers; the uniformity of colour and the excellence of quality of the best imports from the States could not be surpassed by European wood.

Having dealt with the European shipments in the heavy oak trade, the author said that whether English brown oak was a variety, a freak, or the result of old age, time would not permit of consideration, but for absolute beauty there was no wood with which to compare it. Its knotty gnarled grain caused an endless variety of shade and colour, but to bring out the best results all flat work should be used in the veneer; to do this the present price of labour made the work costly, but the result would be better than many daubs which were current as works of art.

As to teak, it was to be hoped that it would be the one wood used throughout in the building of the great cathedral of Liverpool. Teak, whilst it was not difficult to tool, contained an essential oil which rendered it imperishable; as it resisted the alternations of damp and dryness, heat and cold; there was in it an absence of swelling and shrinking or warping, so that the architect had at his disposal an excellent wood either for external or interior fittings. In high-class work there was hardly any purpose to which it could not with advantage be applied. Its general uniformity of colour and grain was positively unique. Considering the many high essentials found in teak, and the remarkably fine sizes obtainable, both in logs and planks, and the freedom from defects in the latter, it was by no means a dear wood for good work. The best shipments were from Moulmein and Rangoon; the Java wood was too hard and gritty for work with much detail.

Having spoken of these three leading fancy woods, the author briefly referred, in alphabetical sequence, to the minor fancy woods and hard woods—*i.e.*, amboyna, ash, beech, birch, black ebony, blackwood, boxwood brigalow, California redwood or sequoia, canarywood, cedar, chestnut, greenheart, hickory, kingwood or violetwood, lancewood, letter or snakewood, lignum-vitæ, jarrah, karri, maple, olivewood, padouk, rosewood, satinwood, sycamore, thuya, tulipwood, walnut, yew-tree, zebrawood, and others.

In the discussion which followed, the Chairman, Mr. H. Stannus, Mr. W. E. Graham, and Mr. A. R. Smee took part, and a vote of thanks was accorded to the lecturer.

THE LONDON MASTER BUILDERS' ASSOCIATION.

THE annual general meeting of the London Master Builders' Association was held in the Board-room, 31 and 32, Bedford-street, Strand, W.C., on the 25th ult.

The minutes of the last annual general meeting were read and confirmed, the report of the Council for 1903 was approved and adopted, and the audited accounts and balance-sheet for the year 1903 were adopted. The annual report stated that the decline in the volume of building operations mentioned in the last report had continued through the past year, which was generally admitted to have been the worst experienced by the trade during the last decade. The Council viewed with much concern the schemes advocated by certain public bodies to remedy slackness of employment. The schemes pointed to an unreasonable extension in municipal undertakings which were antagonistic to the legitimate interests of individual traders, and were calculated to increase to a very great extent the cost of production.

The Association's new subscription rule was working satisfactorily, with the result that substantial additions had been made to the Reserve Fund during the past year. Much more interest had been taken in the proceedings of the Council by members, and the Council urged all members to endeavour individually to strengthen the organisation of the Association by increasing its membership.

No trade dispute of any great significance had occurred during the year, and the Council noted with gratification the increasing usefulness of the Conciliation Boards in settling minor difficulties, and at the same time in affording opportunities to employers and workmen to better understand and appreciate each other.

They regretted that the Plasterers' and Plumbers' Societies were endeavouring to force London employers to pay, on their country jobs, the London rates of wages. This the Council was determined not to countenance, and the members of the Association who were carrying out works in the provinces were strongly urged to refuse to pay to workmen locally employed more than the local rates.

The Council reported that Mr. William Shepherd had consented to give evidence on behalf of the Association before the Royal Commission on Trade Disputes, and that the Council would continue to oppose the passing of the Plumbers' Registration Bill in Parliament.

The Association had been invited to give evidence before a Departmental Committee appointed by the Home Secretary, with a view to amend the Workmen's Compensation and Employers' Liability Acts. A conference had been held by the officers of the Association, the officers of the Institute of Builders, and the directors of the Builders' Accident Insurance. Statements to be laid before the Home Office Departmental Committee had been formulated, and Col. Stanley G. Bird, C.B., and Mr. Henry Holloway, J.P., had consented to give evidence on behalf of the building trade employers.

In reference to proposed alteration in working hours, the Council reported as follows:—

"Recognising the reasonable objections raised by members of the Association against the present winter working hours, your Council held a conference with the representatives of the various trade unions, with a view to making other arrangements of a more satisfactory character. Unfortunately, the conference did not result in an agreement, one of the chief objections raised by the trade unions being that the proposed alterations would involve trade union secretaries in many disputes with builders who are not members of this Association. Your Council hopes that this will induce the members of the L.M.B.A. to persuade builders who are not already members to join the Association. In consequence of the unreasonable demands made by the Crane and Engine Drivers' Society, your Council went fully into the matter, the result being the issuing of a notice containing recommendations to the members employing crane and engine drivers. . . . During the past year forty-two Council, Committee, Conciliation Board meetings and conferences have been held. . . . Your Council reports, with the deepest regret, the loss by death of Mr. B. E. Nightingale, Mr. John Greenwood, and Mr. S. T. Turtle. These gentlemen were active members of your Council and were much esteemed by their colleagues. Mr. W. Hammond, Mr. L. Whitehead (Messrs. L. Whitehead and Co., Ltd.), and Mr. W. G. Sheldon (Messrs. John Greenwood Ltd.) were elected by the Council (*vide* Rule 12) to fill the vacancies caused by the death of Mr. B. E. Nightingale, Mr. John Greenwood, and Mr. S. T. Turtle. . . ."

The following elections were made:—As President, Mr. James Carmichael; Senior Vice-president, Mr. Fredk. Higgs (Messrs. F. and H. F. Higgs); Junior Vice-president, Mr. J. W. Lorden, J.P. (Messrs. Lorden and Son); Honorary Treasurer, Mr. Wm. Higgs (Messrs. Higgs and Hill, Limited); Honorary Auditor, Mr. Archibald B. Howard Colls (Messrs. Colls and Sons).

For the eight vacancies on the Executive Council there were twelve nominations. A ballot was taken, and the following gentlemen were elected:—Mr. F. G. Minter, Mr. E. S. Rider (Messrs. T. Rider and Son), Mr. L. Whitehead (Messrs. L. Whitehead and Co., Ltd.), Mr. G. Appleton (Messrs. Turtle and Appleton), Mr. W. Hammond, Mr. W. G. Sheldon (Messrs. John Greenwood, Ltd.), Mr. Henry Wall (Messrs. H. Wall and Co.), and Mr. F. S. Bywaters (Messrs. G. H. and A. Bywaters and Sons).

A hearty vote of thanks was given to the outgoing President, Mr. Ernest J. Brown, for the successful manner in which he had conducted the business of the Association for the past year.

Messrs. F. and T. Thorne, Poplar, were elected members of the Association.

THE QUANTITY SURVEYORS' ASSOCIATION.

A GENERAL meeting of this Association was held on Wednesday last in the Throne Room of the Holborn Restaurant, Mr. Walter Lawrance, F.S.I. (President), in the chair.

The meeting was the result of an adjournment of the General Meeting of November 18, last, for the purpose of confirming the Articles of Association, previous to registration, which had in the meantime been drafted by the Council.

Copies of the draft articles having been posted previously to intending members with an invitation for amendments, such amendments were put to the meeting by the Chairman, and, with few exceptions, the original draft stood unaltered.

It was decided to eliminate the words "of the United Kingdom" from the title, which would therefore read "The Quantity Surveyors' Association," and would by such title embrace members of the profession in the Colonies and elsewhere.

Some discussion arose on Clause 13 of the articles, which, as amended, reads as follows:—"Any member of the Association who shall supply bills of quantities holds himself responsible for their accuracy, and to pay for all losses caused by his errors therein (when called upon so to do by the aggrieved party). On the refusal of any member to recoup any loss, the Council shall, on the application of the aggrieved party, investigate the matter; and if the member refuses to pay any sum they, the Council, may find to be due through his negligence, he shall be at once expelled from the Association, and shall not be eligible for re-election until the amount is paid. On an application for inquiry being made to the Council, the Council shall decide what charge shall be made by them as costs of such inquiry, and the applicant shall guarantee the payment thereof by discharge of such sum by way of deposit as the Council shall determine."

It was further resolved at the meeting that, in order to ensure that none but fully-qualified quantity surveyors should obtain admission as members, every intending member, whether he had already paid his subscription or not,

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should be compelled to fill up the formal application form to be provided, setting forth his qualifications, according to the requirements of the articles, which form should be thoroughly scrutinised by the Council, and, should an intending member not satisfy them as to his eligibility, he should be rejected; and, even if his subscription had already been paid, it should be returned to him in full.

The Articles as amended having then been unanimously adopted by the meeting, a formal vote of thanks was proposed by the Chairman, and seconded by Messrs. Hoffman Wood and Nixon, to Mr. F. B. Hollis, the Hon. Secretary, for the indefatigable and efficient way in which he had worked to bring the Association first into existence, and ultimately to a successful issue.

A vote of thanks was also tendered to Mr. Lawrance for his invaluable assistance in the drafting of the Articles, and for his attendance as Chairman of the meeting.

The proceedings then terminated.

THE BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.

THE annual dinner of the Provident Institution of Builders' Foremen and Clerks of Works was held on Saturday last week in the King's Hall, Holborn Restaurant, W.C., when a large number of members and friends of the Institution were present. The chair was occupied by Mr. James Carmichael, supported by Messrs. F. J. Dove, W. Duff, W. Gilbee Scott, J. S. Gibson, J. W. Lorden, Guy M. Nicholson, D. W. McInnes, J. C. Hill, F. E. Williams, E. Woodthorpe, T. Cortigan, (Secretary of the London Master Builders' Association), Councillors H. Corben and W. E. Buchanan, and others, the company numbering 624.

The loyal toast having been honoured,

The Chairman proposed the toast of the evening, "Success to the Provident Institution of Builders' Foremen and Clerks of Works." This annual dinner reminded one not only of the flight of time, but also of the legitimate claims of our less fortunate brethren. Each successive year brought not only a change of chairman, but also a change in the names and numbers of subscribers as well as the recipients of the Institution's bounty. That being so, he hoped they would not forget that they had met that night in the best interests of the Institution and in order to further those interests. The Institution had been in existence for about sixty years, and during that time it had spent about 12,000*l.* in relieving 109 pensioners. The affairs of the Institution were administered at a minimum of cost, and in the hands of Mr. Dove, the Governor, whom they were glad to have with them that night, subscriptions were absolutely safe. As to the men the Institution sought to help, he had the very highest appreciation of capable builders' foremen and clerks of works. He thought it was Mr. Carnegie who said that the secret of his success was to a large extent due to the fact that he was able to employ better men than himself. Any little success he (the speaker) had achieved in this Metropolis had been largely due, he had pleasure in saying, to the same cause. A good many builders would get on badly without their foremen, and he considered that the thoroughly capable builders' foreman who had mastered his specification—and by that he meant that he knew it so well that if he were asked a question he could answer it without referring to the book—who understood the drawings, and who could so regulate and place his labour (without bullying or hustling it) that every 10½d. paid in wages brought a shilling in return, was not only a boon to his employer but a blessing to the job on which he was engaged. More than that, he was a guide and example to his fellow workmen and a credit to his country. It was hard, therefore, that after years of hard work he should, through ill-health or misfortune, have to appeal to any institution for assistance, but when he did appeal let them see to it that it was to an institution able and willing to help. The remarks he had made as to foremen applied to the clerk of works, for the efficient clerk of works must first of all have been a builder's foreman. He was not there to advocate the cause of the theoretical young man who came from an architect's office with a bundle of drawings under his arm; he might understand the drawings and he was generally a very nice young man, but it was a misnomer to call him a clerk of works. No, give him the man who had "been through the hoop," who knew what he wanted and understood when he got it. With that sort of man they could bring a building to a successful issue.

Mr. J. Beer, Corresponding Secretary, in response, said that their members were very reluctant to place themselves on the pension list. The Institution had accumulated a reserve fund of 7,000*l.* It might be said that they had plenty of money, but it must not be forgotten that as they increased in numbers so they must increase their reserve fund. They hoped to be able to increase the pension from 17s. 6d. to 1*l.* in the near future. The Institution had done more for the builders' foremen and clerks of works than any other institution.

Mr. D. W. McInnes then proposed "The Architects and Surveyors." He congratulated the Institution on the support it had received from architects and surveyors. The architect could not do without the clerk of works and the builder without the foreman. It was well for the building trade of London that there existed so much unanimity between architects and surveyors and those who were more directly engaged in carrying out their work.

Mr. W. Gilbee Scott, who responded for the architects, said architects, builders' foremen, and clerks of works had very much in common. They were mutually dependent upon each other for the success of every work in which they were engaged. If they all had the feeling in their minds that they would do only good work, and if they would all deal fairly and honestly by each other, the good feeling which had always prevailed would continue, and they would hand down to posterity work of which they need not be ashamed. No one could appreciate more than an architect the benefit of such an institution as the builders' foremen's and architects wished them all the success they desired and deserved.

Mr. Guy M. Nicholson, who responded for the surveyors, said that the Chairman had told them he did not think much of the clerk of works who came from an architect's office. He (the speaker) did not think much, from what he had seen, of bills of quantities that came out of architects' offices. One he had seen was for a church. The question arose almost as soon as the church was started that there was only one centre taken for the arches of the nave arcade, and the builder naturally wanted more than one. The architect said that that was unreasonable; the one centre he had taken could be used over again for all the arches. The builder answered that that was so, but if the architect wished that to be done it would require about three years in which to do the building. That seemed to point to the fact that some training was necessary for the work of quantity surveying. It was generally found that people who thought there was very little in a business or profession were those who were outside it. If those who went to an architect instead of a surveyor for quantities did not regret it, the builder did. As to that Institution, with which he had every sympathy, he wished that the whole system of provident institutions was made a national affair. A man who met with misfortune in the discharge of his duties should be taken care of at the expense of the nation, especially when he was doing absolutely necessary work and was not paid sufficient to enable him to put by a reserve for future needs.

Mr. J. S. Gibson then proposed the toast of "The Builders and Contractors," coupled with the name of Mr. J. W. Lordon, Mayor of Wandsworth. Builders as a class existed long before architects. There was no doubt that when men began to gather together and form tribes and nations builders came into existence and erected those magnificent temples and palaces, the remains of which in some cases have lasted down to our day, and, in reading the history of the human race, it was largely through the lessons which these temples and their sculptures taught that we got an idea of the daily life and the history of the nation which erected them. Consequently, these works were the literature of the people of the time, and he trusted that that would be the case with present-day works. If builders and contractors would build honestly and well, future generations would read in our buildings the history of our time, and we should not be ashamed to hand on these monuments of honest endeavour to construct noble and beautiful buildings. Personally, he had always had the best and most amicable relations with builders and contractors, and no doubt this was a common experience.

Mr. Lorden, in the course of his response, said that there appeared to be a great many builders and contractors in London according to the London Directory, but names appeared in that work of many who, he supposed, had never built and never constructed. As to builders and contractors, it was rather a misnomer to call them by those names; more properly they should be called building contractors. As to the Institution, he regretted that more builders and contractors did not subscribe to its funds, for the Institute was doing a very good work, and it ought to be better supported by builders. He endorsed what had been said about the gentlemen who came out of an architect's office and called himself a clerk of works. It was absurd to think that such a man could carry out the duties of clerk of works in the way that a clerk of works could who had gained his experience as a foreman and had learnt how to deal with the men and just where to look for anything that might be wrong.

The list of subscriptions and donations to the funds of the Institution was then read. The total (including 25*l.* from the Chairman, 10*l.* 10s. from the Master Builders' Association, and 10*l.* 10s. from the Associated Portland Cement Manufacturers) amounted to 469*l.*

Mr. F. Hann, the Financial Secretary, then proposed "The Governors, Trustees, Donors, Subscribers, and Visitors." In the course of his remarks he said that this was a record year for the Institution. They had a record number of members, whose subscriptions totalled 30*l.* more than ever before; the amount paid in pensions last year was 40*l.* more than they had ever paid before (the amount paid was 468*l.*); there had been an increased number of builders' subscriptions, and that evening, thanks to the energy of the Chairman, the total amount of subscriptions just read was over 200*l.* more than ever had been subscribed before. It was pleasing to see so many builder and architect subscribers and that was what they wanted to see. Every builder and every architect who subscribed had the right to nominate a candidate for membership, and that candidate was sure of the support of the officers. They wished to increase their membership and make the Institution more useful.

Mr. F. J. Dove replied for the Governors and Trustees. He had been connected with the Institution for thirty years, and every year, he believed, there had been an increase in prosperity, but he thought that the increase this year eclipsed all previous advances.

Mr. J. C. Hill replied for the Visitors, and suggested that as the Institution had no life members it might be well to apply to builders and contractors of London to join as such.

The remaining toast was "The Chairman," proposed by Mr. W. J. Stapleton, Treasurer. Mr. Carmichael, he said, had risen from the ranks to his present position of one of the largest builders in London by his own energy, perseverance, and ability. He was a just, liberal, and appreciative employer, and in consequence of these qualities he had one of the most devoted staffs in London, many of whom had been with him ever since he commenced business.

BUILDING BY-LAWS REFORM ASSOCIATION.

THE second annual general meeting of the Building By-laws Reform Association was held at Grosvenor House (by kind permission of the President, the Duke of Westminster) on Monday, the 29th ult.

Among those present were Sir William Chance, Bart., Lord Hylton, Sir Edmund Verney, Messrs. Mark H. Judge, E. D. Till, J. Welford, Leonard Judge, E. J. May (and Son), Stephen Rowland, T. Myddelton Shallcross, R. W. Schultz, John Martineau, J. W. Shelley, W. G. Lewis, A. Newbold, Herbert A. Powell, A. H. Clough, S. M. Wilson, James Martin, Thackeray Turner, H. S. Storey, H. G. Willink, William Henman, etc. Letters of regret were read by the Hon. Secretary from the Duke of Westminster and others.

The minutes of the last meeting were read and adopted. The annual report was taken as read, and the Chairman moved the adoption of the report and stated that twelve Council meetings and nine Committee meetings had been held. He said that hard-and-fast building by-laws created hardship in many cases, and he invited members of the Association to forward their experiences with a view to their publication as a pamphlet, and he thought that, judging by his own experience, many people suffered themselves to be interfered with by

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local authorities rather than incur the time, trouble, and expense of resisting them. By-laws had been promoted for the protection of the poor, and the old idea of one law for the rich and another for the poor had been reversed in the case of building by-laws to the great hardship of the rich. There should be an exemption clause in all by-laws, at least as affecting the parts of buildings above ground; there should be no interference with a private individual who erected property upon his own estate and apart from other buildings; and the man who provided gardens for his tenants should receive greater consideration than the man who did not do so.

Lord Hylton, in seconding the adoption of the report, said, as a landowner in more that one county, he had taken great interest in the Association. He had seen the deleterious effects of hard-and-fast building by-laws and the consequent restriction of the erection of labourers' cottages. He cited several instances where he had been interfered with by building authorities, and thought legislation was urgently required to relieve rural landowners from building restrictions upon their private estates.

Mr. T. Myddelton Shallcross regretted to be unable to support the adoption of the report, more especially as the lapse of time had lessened, to some extent, the original differences of opinion between the majority and minority of the Council as to the policy proper to be pursued by the Association. [In order to avoid digressions from the subjects in the report to which he desired to allude, Mr. Shallcross had placed his views in writing in a long communication, for which we cannot find space.] His two main objections were, first, the notice convening the last Council meeting was only delivered to the members of the Council two days before the meeting was held; that, owing to the shortness of notice, it was not possible for all the members of the Council to be present at that meeting; and the report had not, in consequence, been properly considered by the Council before being submitted to the general meeting. And, in the second place, that the work of the "By-laws Committee," as indicated by clauses (i), (ii), (iii) of the report submitted for adoption by the meeting, was not proceeding in accordance with the Articles of Association. He said that the Articles of Association distinctly stated the objects of the Association to be as follows:—

"(A) Where Building By-Laws or Regulations are in force, *to promote amendments so that official control of private buildings shall not extend beyond the demands of public health and safety, and thus to prevent encroachments on individual liberty;*

"(B) Where it is intended to adopt such By-laws and Regulations, to secure that those adopted shall satisfy the above conditions;

"(C) To assist as far as possible in suitable cases those who may be *unduly interfered with by Building By-laws and Regulations.*"

There appeared to be no differentiating between urban and rural building by-laws, and Mr. Shallcross went on to argue that the lines upon which it was stated in this report that a "By-laws Committee" was working in regard to "Rural By-laws" were not in accordance with the accepted policy of the Council, and that the Council had not assisted "as far as possible in suitable cases those who may be unduly interfered with by building by-laws and regulations." He moved that this report be not adopted, and that it be referred back to the Council for further consideration.

Sir Edmund Fernie seconded the amendment. He thought it very desirable there should be unanimity in the counsels of the Association, so that it should present a bold front and command the support of the public.

Mr. Mark Judge said the Council were all agreed, excepting Mr. Shallcross, and he thought the latter should have agreed with the majority of the Council, or have retired.

The Chairman then put the amendment to the meeting, and it was lost, and the report was subsequently carried.

The Chairman then submitted the following names as the Council for the ensuing year:—Sir William Chance, Bart., Mr. W. M. Acworth, Lord Robert Cecil, Mr. A. H. Clough, the Hon. John E. Cross, Mr. Anderson Graham, Mr. W. Henman, Mr. Mark H. Judge, Mr. E. L. Lutyens, Mr. Arthur Newbold, Dr. G. V. Poore, Mr. H. A. Powell, Mr. Lacy W. Ridge, Mr. R. W. Schultz, Mr. J. St. Loe Strachey, Mr. E. D. Till, Mr. Thackeray Turner, Mr. Christopher Turnor, Mr. H. G. Willink, and the Hon. Percy S. Wyndham.

Sir Edmund Fernie moved that the gentlemen named above be the Council for the ensuing year.

Mr. John Martineau seconded, and said the best building by-laws were no by-laws at all, and he thought that, when detached from other property, the buildings of rural landowners should be free from such restrictions.

Mr. H. S. Storey supported the election of the members proposed on the Council, and urged the great desirability of the Special Committee bringing their labours to an end as soon as possible, and making the principles of the Association known. All cottages built by a landowner on his estate for his own people should be free from by-laws.

Mr. James Martin spoke as a builder and a member of a district council, and said it was impossible to convince some district councillors of the disadvantages of hard-and-fast by-laws, and he thought there should be no by-laws enforced when an architect was looking after a building. The masses of the people ought to be educated to look to their own interests.

Mr. H. A. Powell said that local authorities could ignore their own by-laws, and that that was the best way out of the difficulty.

Mr. R. A. Read, the Hon. Secretary of the Association, thought the last speaker's advice was dangerous, as any ratepayer could obtain a *mandamus* from the King's Bench to compel the local authority to carry out their by-laws.

Mr. H. G. Willink agreed that it would be dangerous for local authorities to ignore their own by-laws. He thought there was something to be said for hard-and-fast by-laws, as it would be wise not to lose the support of medical officers of health; and these relied considerably upon hard-and-fast by-laws for the protection of small cottagers.

The Council, as proposed, was then elected.

The Chairman proposed, and Lord Hylton seconded, that the best thanks of the meeting be accorded to the Duke of Westminster for kindly placing Grosvenor House at the disposal of the Association, and it was carried ununimously.

Mr. H. G. Willink proposed, and Mr. T. Myddelton Shallcross seconded, a vote of thanks to the Chairman, and it was carried unanimously.

The Chairman returned thanks, and proposed a vote of thanks to the Hon. Secretary, Mr. R. A. Read, for his past year's work, and Mr. Thackeray Turner seconded it, and it was carried unanimously. Mr. Joseph Hurst was re-elected auditor.

The annual general meeting then dispersed, and a meeting of the new Council was subsequently held.

THE ENGINEERING STANDARDS COMMITTEE.

FROM a "statement of work now in progress" issued a few days ago by the Engineering Standards Committee we have prepared the following brief notes for the information of our readers.

Although comparatively few reports have as yet been actually published, an enormous amount of information and material has been collected, and a large number of specifications and findings are approaching the final stage.

The first report issued was that on "Standard Rolled Sections," and these sections, we are glad to learn, are slowly but surely finding their way into use throughout Government Departments, as well as in the general trade of the country.

A report to the Main Committee has been presented on a "Standard Specification for Steel used in Ships" by the committee dealing with iron and steel for ships, and this report is now being discussed by other committees. Professor Unwin's report on the work carried out by him for the same committee has already been noticed in our columns.

The Locomotive Committee has drawn up a report relative to standard types of locomotives for Indian railways, which is at present under the consideration of the Secretary of State for India. A Sub-committee on Locomotive Steel Plates has drawn up a draft specification, which has still to be considered by other sub-committees, and a Sub-committee on Copper and its Alloys has completed a standard specification for copper plates, rods, and tubes used in locomotives. This report will shortly be issued.

The Sub-committee on Railway Rails has prepared a series of standard sections and specifications, which is being discussed by the leading railway companies and engineers, and will be published at no distant date.

The report of the Sub-committee on Tramway Rails has already been published, and noticed in our columns.

A standard specification for telegraph and telephone wires has been drafted by the Sub-committee on Telegraph and Telephones, and standard lists of electric cables and wires represent part of the work done by the Sub-committee on Cables.

The calculations in connexion with standard beams have been completed by the Publications and Calculations Committee, and those for other sections will follow in due course.

Finally, we may mention that, in addition to the Main Committee, there are twelve sectional committees and eighteen sub-committees, the entire organisation including 192 members. From the large number of subjects under consideration, and the number of committees actually at work, some idea may be gathered of the far-reaching extent of the Committee's labours, and the importance of their findings to the industrial classes in this country.

THE LONDON COUNTY COUNCIL.

THE last meeting of the present London County Council was held on Tuesday, in the County Hall, Spring-gardens, S.W., Lord Monkswell, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend the Guardians of St. Olave's Union, 1,075*l.* for poor law purposes, and the Guardians of the Strand Union, 2,470*l.*; and the Guardians of St. George-in-the-East, 2,870*l.*, for similar purposes; the Metropolitan Asylum Managers, 100,000*l.*, for hospital re-construction and other work; and Camberwell Guardians, 3,000*l.* for compensation payments. Sanction was also given to Westminster City Council to a loan for 2,730*l.* for sewer works.

Tramways.—The following recommendations of the Highways Committee were agreed to:—

"That the estimate of 6,600*l.*, submitted by the Finance Committee, be approved; and that expenditure on capital account of sums not exceeding that amount in all, be authorised in respect of the reconstruction, as double lines, for the underground conduit system of electrical traction, of the existing single line of tramways in Goswell-road, between Clerkenwell-road and Upper Ashby-street, under the powers conferred by the London County Tramways Act, 1900.

"That the estimate of 6,209*l.* submitted by the Finance Committee, be approved; that consent be given to the widening of Streatham High-road between Mount Ephraim-road and the Tate Library, proposed to be undertaken by the Council of the Metropolitan Borough of Wandsworth in accordance with the plan presented to the Improvements Committee on February 17, 1904; that a contribution be made on the usual conditions of two-thirds of the net cost of the improvement on the understanding that one-half of the Council's contribution will be charged to the tramways account, the remaining half being charged to the account of the improvement."

Theatre Safety.—The Theatres and Music-halls Committee brought up the following report:—

"We have given special consideration recently to the question of the precautions that should be adopted in premises licensed for public entertainments, in order to minimise as far as possible the risk of fire or panic, and we are of opinion that it would be well to make certain additions to the existing rules. The Lord Chamberlain is quite in accord with us in these suggestions, and we recommend:—

"(a) That the undermentioned rules be incorporated with those now in force in respect of premises licensed by the Council for public entertainments:—

"(1) All exit doors must be thrown open for the use of the audience at the end of the performance.

"(2) Persons must not be permitted to stand or sit in any of the gangways.

"(3) Overcrowding must not be permitted in any part of the premises.

"(4) Each exit door from the auditorium and stage must have a distinctive light fitted over it, such light to illuminate the exit notice, and to be maintained throughout the performance.

"(5) All exit doors must have a notice clearly painted on them indicating the method of opening them.

"(6) Where practicable broad conspicuous lines at shoulder level, with frequent arrows indicating the way out, must be painted on the walls in all the corridors and exits leading to the street.

"(7) The seating area assigned to each person must not be less than 2 ft. deep and 1 ft. 6 in. wide, in all parts of the house where no backs or arms are provided to the seats, and not less than 2 ft. 4 in. deep by 1 ft. 8 in. wide where backs or arms are provided. In all cases, however, there must be a space of at least 1 ft. in depth between the front of one seat and the back of the next, measured between perpendiculars.

"(8) All check boxes must be recessed or removed.

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"(9) Where there is a fire-resisting screen to the proscenium opening it must be lowered at least once about the middle of the performance in the presence of the audience so as to ensure its being in proper working order.

"(10) An inscription of the following nature must be exhibited on the fire curtain—'Safety Curtain.' The notice to be exhibited in sufficiently large letters that it can be read from all parts of the house.

"(11) Whenever the curtain is lowered, all lights in the auditorium, which are not controlled from the stage switch-board, must be lighted.

"(12) No wires, &c., in connexion with gymnastic or other displays, or any other apparatus must be allowed to interfere in any way with the lowering of the fire curtain.

"(13) All scenery, wings, sky borders, cloths, draperies gauze cloths, floral decorations, properties, hangings, curtains, &c., whether on the stage, in the auditorium, or in other parts of the premises, must be rendered and maintained non-inflammable.

"(14) Where performances are regularly given and where scenery is used, at least one fireman must be employed during the entertainment. The responsibility as regards the employment of such men must rest as at present with the management.

"(15) A sufficient number of employees must have definite duties allotted to them in the event of fire or panic, and statements of such duties must be posted up in conspicuous positions. Fire drills must be held at least once a week in all theatres, music-halls, and large concert halls.

"(16) Smoking by members of the orchestra or others must be strictly prohibited within the stage risk.

"(17) Drugget or crumb cloths where used must be secured so as to be in no way liable to rucking or to be in any way a source of danger to members of the audience.

"(18) Smoking must not be permitted in the auditorium, if the premises are used for dramatic entertainments.

"(19) Where there is an electrical installation a properly qualified man must be in charge of such installation.

"(20) In all cases in which it is desired to instal temporary lighting, notice must be given to the clerk of the Council, in writing, as long as possible before it is desired to commence the work.

"Wires and cables must be adequately and firmly fixed, and must be similar to the wires specified in the Council's regulations, and in all cases where the wires are within reach of the public, they must be cased.

"All joints must be soldered and taped if used for more than one week, and if used less than a week the wire must be soldered, if larger than 720 S.W.G. or its equivalent. In either case the joints must be taped.

"The circuits must be sub-divided as much as possible, no sub-circuit exceeding 10 ampéres.

"All temporary work must be immediately removed when no longer required for the purpose for which it was installed.

"In the case of temporary work on the stage, all connexions to the permanent installation must be removed immediately after each performance in which they are used, unless permission be obtained to the contrary.

"Such special conditions as may be requisite in each case will be attached to the consent of the Council to the use of temporary electrical work.

"(21) All main switches, fuses, &c., which are the property of the electric supply company, shall be distinguished by being coloured red with a white band.

"(22) At least one pair of india-rubber gloves must be provided for the use of the electricians in connexion with the electric lighting arrangements as a precaution in the event of high voltage occurring. The gloves must be kept on the stage switch-board and be kept in good order.

"(23) At least one bucket, filled with dry sand, must be kept in some accessible position on the stage in readiness for use in dealing with an electric fire, and one must also be kept in each of the intake rooms.

"(24) Communication must be established between a point on the stage, in close proximity to the releasing gear to the fire curtain and the telephone alarm in connexion with the nearest fire-brigade station.

(*b*) That, Nos. 1, 2, 3, 9 and 18, of the above-mentioned rules, and No. 7 of the present rules, which is to the effect that the corridors must not be used as cloak rooms, and no pegs for hanging hats and cloaks shall be allowed therein, be printed in block type on all programmes, on the same page as the caste, for the information of the public, and that Nos. 9, 11, 12, 13, 16, 22, 23 and 24 of the above-mentioned rules, be posted up on each side of the stage behind the fire-curtain, where there is such a curtain, in addition to, or in amendment of those required to be so printed and posted up by resolution of the Council, dated 22nd and 29th July, 1902.

(*c*) That, subject to recommendation (*a*) being adopted, a copy of the rules, as altered, be sent to the licensees of all places licensed by the Council for public entertainments.

Mr. Foster moved that the report be referred back in order to allow architects and others to consider the various recommendations.

Sir A. West, Chairman of the Committee, said he could not withdraw the rules, which were in the interests of the safety of the public.

The recommendations were then adopted.

Asylums.—The following recommendations of the Asylums Committee were agreed to:—

"That the estimate of 1,000*l.*, submitted by the Finance Committee, be approved; and that expenditure not exceeding that amount be authorised for the preparation of plans, etc., of permanent buildings at the Banstead Asylum, to accommodate 300 male patients and the necessary staff in lieu of the existing temporary buildings.

"That the estimate ot 1,500*l.*, submitted by the Finance Committee, be approved; and that expenditure not exceeding that amount be authorised for the preparation of plans, &c., of permanent buildings at the Colney Hatch Asylum to accommodate 310 patients and the necessary staff in the place of the temporary buildings recently destroyed by fire.

The Recent City Fire.—Captain Hemphill, Chairman of the Building Act Committee, in replying to questions on the recent fatal fire in Duke's Head-passage, Paternoster-square, said the Council had no power under the London Building Act to prevent the re-erection or alteration of buildings in narrow courts unless they happened to be dwellings for the working-classes, provided that the buildings existed before the passing of the Act of 1894. In this area there were a large number of *culs de sac*, and the Council had no power or control over them in the City, because the City had special exemptions under the Building Act. This unfortunate fire illustrated the urgent necessity for an amendment in the Building Act. No matter how good, able, or efficient the Fire Brigade might be, it was impossible to save life unless the buildings were properly constructed.

Mr. Burns: Will the Chairman of the Committee consider the necessity of recommending to the Common Council the desirability of having the posts at the entrances to these narrow passages placed upon hinges?

Captain Hemphill: The committee will undoubtedly do that.

Fire Station, Isle of Dogs.—The Fire Brigade Committee recommended, and it was agreed:—

"That expenditure not exceeding 11,300*l.* be authorised for the work of erecting a new fire-station in substitution for the existing Isle of Dogs station; that the work be executed by the Council without the intervention of a contractor; and that the drawings, quantities, specification, and estimate be referred to the Works Committee for that purpose."

Question of Tender.—At a previous meeting a report was presented by the Highways Committee recommending that the tender of Messrs. W. Griffiths and Co., Ltd., London, should be accepted, at the sum of 86,623*l.*, for the reconstruction for electrical traction of the Streatham cable tramway and construction of authorised tramways at Tooting. The recommendation was adjourned, on the application of the chairman of the committee, and a revised report was now brought up with the recommendation that the tender of Messrs. J. G. White and Co., Ltd., London, at the price of 95,005*l.*, should be accepted. The full list of tenders was given in our last issue, page 240.

A long discussion took place as to the change recommended, but an amendment to refer the matter back was defeated, and the recommendation of the committee was adopted.

Model Dwellings.—The Housing of the Working Classes Committee reported that in the Council's model dwellings on the Boundary-street estate the annual death-rate for 1903 was 12.7 per 1,000, as compared with 18.2 in Bethnal Green; and that taking the whole of the Council's dwellings the death-rate was 11.8, as against 15.2 in London as a whole.

Sir W. Collins said it was one of the most encouraging results of the Council's work that so many fever-laden slum districts had been converted into healthy residences.

Islington War Memorial.—On the recommendation of the Parks and Open Spaces Committee, permission was granted to the Islington Borough Council to erect on Highbury-fields a memorial to Islingtonians who lost their lives in or as a result of the South African War.

Refreshment House, &c., Hackney Marsh.—The same committee recommended, and it was agreed:—

"That the estimate of 2,205*l.*, submitted by the Finance Committee, be approved, and that expenditure not exceeding that amount be authorised for the erection of a composite building at Hackney Marsh to provide the following accommodation—refreshment-room, cartshed, bothy, dressing-room, conveniences, and store; and that tenders be invited for the erection of the building."

Hainault Forest.—They also recommended, and it was agreed:—

"That the estimate of 1,500*l.*, submitted by the Finance Committee, be approved; and that expenditure not exceeding that amount be authorised in connexion with the laying out and planting of the farmed land at Hainault-forest."

Technical Institute, Hammersmith.—On the recommendation of the Technical Education Board, it was agreed that the estimate of 5,800*l.* be approved; and that the site, belonging to the Latymer Trustees, in Lime-grove, Hammersmith, be purchased by the Council for a sum not exceeding that amount, including the legal and other expenses connected with the purchase; that the site be appropriated for the purposes of technical education within the provisions of the Technical Instruction Acts; and that the purchase money and other expenses connected with the purchase be paid out of capital account.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Lewisham.—Wooden overhanging eaves and barge boards and projecting wood and slate pents to nine houses on the south-west side of Ewhurst-street, Lewisham, between Bexhill-road and Salehurst-road (Mr. T. W. H. Standen).—Consent.

Brixton.—A building on the south side of Southesk-street, Stockwell (Mr. W. S. Huxley for Messrs. Hammerton and Co.).—Consent.

Hackney, Central.—A one-story shop upon part of the forecourt of No. 253, Mare-street, Hackney (Mr. H. P. Monckton for the Pearl Life Assurance Company, Ltd.).—Consent.

Hackney, North.—An addition on the eastern side of St. Anne's House, Manor-road, Stoke Newington (Mr. E. Goldie).—Consent.

Strand.—Projecting balconies at the Savoy Hotel extensions to abut upon the Strand, Savoy-court, and Savoy-buildings (Messrs. Collcutt and Hamp).—Consent.

Woolwich.—That the application of Mr. H. O. Thomas for an extension of the period within which the erection of houses on the east and west sides of Back-lane, Artillery-place, Woolwich, was required to be commenced, be granted.—Agreed.

Strand.—Iron and glass shelters at east and west blocks of the Savoy Hotel extensions, Savoy-court, Strand (Messrs. Collcutt and Hamp).—Refused

Lines of Frontage and Space at Rear.

Hackney, South.—A building on the north side of Atherden-road, Clapton, between Rushmore-road and Alfearn-road (Mr. C. W. Hodgson for Mr. H. Pyle).—Refused.

Width of Way.

City.—Retention of a building on the site of St. Michael Bassishaw Church, Basinghall-street, City, with external walls at less than the prescribed distance from the centre of the roadway of Church-alley (Mr. R. M. Roe).—Consent.

Formation of Streets.

Woolwich.—Deviation from the plan sanctioned for the formation of a street to lead from Macoma-road to Ennis-road, Plumstead, so far as relates to an alteration in the gradient of such new street (Mr. J. O. Cook).—Consent.

Wandsworth.†—That an order be issued to Mr. G. A. Hall sanctioning the formation or laying-out of a new street for carriage traffic to lead from Streatham-common North, to Deepdene-road, and the widening in connexion therewith of portions of Deepdene-road and Streatham-common North (for Messrs. Thynne and Thynne).—Consent.

Woolwich.—That an order be issued to Mr. F. Bethell sanctioning the formation or laying-out of a new street for carriage traffic to lead from Bostall-hill to McLeod-road, Plumstead (for the Royal Arsenal Co-operative Society, Limited).—Consent.

Chelsea.†—That an order be issued to Mr. G. D. Martin refusing to sanction the formation or layin-out of a street for foot traffic only to lead from Brompton-road to Basil-street, Chelsea (for Mr. D. H. Evans).—Refused.

Battersea.—That an order be issued to Mr. W. A. Large, refusing to sanction the formation or laying-out of two streets at the rear of proposed buildings on the east side of St. John's-road, between Battersea-rise and Beauchamp-road, Battersea (for Messrs. Jones Brothers).—Refused

Wandsworth.—That an order be issued to Mr. W. Bartholomew refusing to anction the formation or laying-out for carriage traffic of a new street in continuation of Vants-road, Tooting, and of a new street on land adjoining northward.—Refused.

Cubical Extent.

Southwark, West.—The erection at Mansfield-street, Borough, of an addition to a building exceeding in extent 250,000, but not 450,000 cub. ft., and used only for the purposes of the manufacture of printing machines (Messrs. R. Hoe and Co.).—Consent.

Southwark, West.—The erection on the east

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side of Hatfield-street, Southwark, of a building with two divisions, each to exceed in extent 250,000, but not 450,000 cub. ft., and to be used only for the purposes of the trade of lithography and printing (Mr. F. Matcham for Messrs. Hudson and Kearns).—Consent.

Buildings for the Supply of Electricity.

Whitechapel.—Additions to a generating-station and works at Osborn-street, Whitechapel (Mr. W. Jameson for the Metropolitan Borough of Stepney).—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the meeting on the 25th ult., Mr. Butler Wilson presiding, a paper entitled "The Romanesque Churches of Auvergne" was read by Mr. W. H. Bidlake. The lecturer observed that France, during the period when the Romanesque style was in vogue, might be regarded as having comprised several architectural districts, and of these none was more distinct than that of Auvergne. The chief interest in these buildings lay in the intermediate position they occupied between the ancient Roman buildings in the South of France and the fully-developed Gothic cathedrals of the North. The paper was illustrated by many fine lantern views.

SHEFFIELD SOCIETY OF ARCHITECTS.—"Sir Christopher Wren: His Times and Works," formed the subject of a lecture by Mr. J. B. Mitchell-Withers, at a meeting of the Sheffield Society of Architects and Surveyors, held at their rooms, Leopold-street, on the 25th ult. Having made a few opening remarks, the lecturer proceeded to speak of the personality of Sir Christopher Wren, referring to his distinguished ancestry and the early development of his powers of thought, showing that at an early age his scientific knowledge and abilities brought him into prominence, and that, in addition to a liberal education, he had had the advantage of mixing with many of the great thinkers of his day, both at the meetings of the Royal Society and elsewhere, thus being fitted to take up the work that fell to his lot shortly after the Restoration, when he was appointed assistant to the Surveyor-General by King Charles II. In reference to his architectural education, while little was known of this previous to his studies in France about the time of the Great Plague in London, the lecturer stated that it would seem probable that Wren had some general knowledge of the subject, as his father had been employed while Dean of Windsor to design buildings for his Queen, and that we find Wren employed by his uncle, the Bishop of Ely, on buildings at Pembroke College, Cambridge, and that he was also employed to design the Sheldonian Theatre at Oxford, besides having to report, in his capacity as surveyor, on the state of Salisbury Cathedral and old St. Paul's, London; and that he had the knowledge which enabled him to criticise the faulty construction which he found in these buildings. After referring to Wren's studies in France, he proceeded to refer to the history of the times, both general and architectural, in an endeavour to show that Sir Christopher Wren had had many difficulties to face when he was called, after the great fire in London, to take up the works in the city required in its reconstruction, and in the rebuilding of those edifices entrusted to his special care. The lecturer then proceeded to refer to various illustrations of St. Paul's Cathedral, showing the designs Wren originally submitted to the King and those afterwards submitted, from which the present Cathedral was built. He then showed illustrations of some of Wren's city churches, and spoke of the difficulties the architect had to face in building these, and of the way he had apparently endeavoured to make them group with his great Cathedral, and how their towers and spires still afforded a relief to the monotony of the buildings erected for commercial purposes. On the motion of Mr. F. Barker, seconded by Mr. C. F. Innocent, and supported by Messrs. W. J. Hall, E. M. Gibbs, W. G. Buck, and others, a vote of thanks was accorded to the lecturer.

GLASGOW ARCHITECTURAL ASSOCIATION.—The eighth ordinary meeting of the Session was held on Tuesday, 27th ult., Mr. W. J. Blain, President, in the chair, when a paper, illustrated by lantern slides, on "Byzantine Architecture" was read by Mr. Alexander McGibbon. The current interest in the style among architects—largely due to its adoption for the Westminster Cathedral—was the essayist's justification of the analysis and appraisement offered. Though beyond any likely gain in the way of addition to stock-in-trade features, the inherent worth of many of its motives and methods, æsthetic and constructional, should command attention. Extravagant claims had been advanced for its present-day applicability, and unwisely, for its limitations were evident. As mediæval Greek it had what we should expect, an excellence of ornament, distinct from that of Western Roman both in design and execution, and there was a special treatment given to the column and capital; but beyond the developments, not origination, of the pendentive dome, and the superseding of marble by glass mosaic, there was little of real invention. It was noteworthy that the undesirable merits of the style in decoration, architectural design, and constructive ingenuity were coincident with degeneracy in other arts; sculpture and figure drawing were of the poorest. The principal historical examples were passed in review. Subsequently Mr. James Lochhead discussed some of the points before proposing a vote of thanks.

Correspondence.

QUANTITY SURVEYORS AND THE SURVEYORS' INSTITUTION.

SIR,—Mr. Deacon's well-meant remarks made at the dinner of the Clerks of Works' Association, as reported in your issue of last week, convey the impression that the memorial about to be presented to the Council of the Surveyors' Institution is being sent on behalf of "a small body" of quantity surveyors. Will you kindly give me the opportunity of stating that the memorial has been signed by practically all the leading London quantity surveyors, as well as by many others of repute both in London and in the provinces, and there are still a large number who are waiting the opportunity to sign. The document, therefore, may be fairly claimed to represent the views of the profession, and not merely a small section of it. The adoption of our suggestions will make the Institution as representative of the quantity surveyor as any reasonably-minded man could wish, and will, it is believed, lead to a binding together of the profession, and an improvement in its status which cannot fail to be of advantage both to the members of the profession and to all those with whom they are brought into contact, by placing them, their work, and all that relates to it on a firm and satisfactory basis.

There may be one or two quantity surveyors members of the Institution who, from oversight, have been as yet uninvited to sign the memorial. Should there be any who do not hear from me in the course of the next few days, I shall be pleased to afford them the opportunity of signing if they will write to me.

Personally, I hope to see, in the near future, arrangements made by which those few old-established quantity surveyors of undoubted standing, and whose qualifications admit of no question, may be admitted to the membership of the Institution without the (in their case) unnecessary ordeal of examination, which, on account of their age, prevents many otherwise most eligible men from being elected.

HARRY G. ASSITER.

9, John-street, Adelphi.

Books.

The Cathedral Church of St. Patrick, Dublin. By J. H. BERNARD, D.D., Dean of St. Patrick's. London: George Bell and Sons. 1903.

TO THE readers of this interesting addition to Messrs. Bell's Series of Cathedrals the feeling uppermost will probably be one of surprise that so much of the mediæval cathedral church of St. Patrick's has been spared. After a long series of misfortunes, and years of neglect, added to which was a naturally treacherous foundation, the building had suffered terribly; but within the last forty years, thanks chiefly to the munificence of the late Sir Benjamin Guinness and Lord Iveagh, it has been made safe and more worthy of its place as the Metropolitan Cathedral of Ireland. Much has also been done to improve the immediate surroundings, particularly on the north side, and the building is now isolated and can be well seen from almost all points. The chief architectural interest is in the work of the choir and presbytery, which is good XIIIth century work. The Lady Chapel was rebuilt by Carpenter, and more recently considerable repairs have been done in the nave and porches added on its north and south sides. The banners of the Knights of St. Patrick hang over the choir stalls, and the new organ chamber recently added on the north side at the triforium level forms a pleasing feature in the exterior views, and is approached by a spiral staircase in the north transept—both being from the designs of Sir Thomas Drew.

All these points are very fully and well illustrated in the book, and a number of reproductions of views are also given showing the condition of the church in the latter part of the XVIIIth and beginning of the XIXth centuries. One of these of earlier date (1733), showing the tower without its stone spire—an addition made in 1749 to Archbishop Minot's work—is particularly interesting. Three plans are given, one of the precincts, one from Kendrick's "Survey," showing the cathedral arrangement in 1754, and a third at the end of the book, showing roughly its present state. This plan, however, would have been more valuable had it had the dates of the various parts of the building clearly marked on it. Of the monuments, few in number, that remain, two interesting brasses to Deans Sutton and Fyche are illustrated, and on page 63 is an excellent photograph of the bust of Swift, who lies buried in the nave. A list of the deans is given from the early years of the XIIIth century to the present time.

Free-hand Lettering: Being a Treatise on Plain Lettering for Use in Engineering Schools and Colleges. By VICTOR T. WILSON. London: Chapman and Hall. 1903.

THIS is a book by an American author, published in the first instance by Messrs. Wiley, of New York, and is rather amusing in the solemn and detailed directions which are given to insure success in a kind of work which in reality only requires a little common-sense and care, coupled with the power of clean draughtsmanship. For the book has little or nothing to do with artistic lettering in the true sense of the word; it aims at promoting nothing more than the neat lettering of engineering plans, though there is a passing reference to the fact that architects do (on occasion) aim at more artistic design than is contemplated in this book. Indeed, Mr. Wilson does not seem awake to the fact that most of the types of plain capitals of the Renaissance period are no more complicated and a great deal finer in line and proportion than what he calls "modern Roman large." It is amusing, also, to find that the very simplest form of capitals, what are usually called here "block letters," are catalogued by an American writer as "modern Gothic," while of the picturesque mediæval characters which we call Gothic no mention is made and no illustration given.

However, for those who require so much instruction in the simple art of lettering, the instructions are mostly quite sound, with the exception of the terrible Plate XX. of examples of the "ornamental" style of lettering supposed to be suitable for advertisements. These are no worse than what one constantly sees in advertisement and trade headings, but to see them deliberately put in a book as examples does give one rather a shudder. The examples of ordinary lettering, however, are good, and fit for their purpose, and the instructions for setting out lettering are quite to the point—only we cannot understand anyone really requiring instruction on such very obvious matters.

The Planning and Fitting-up of Chemical and Physical Laboratories. By T. H. RUSSELL, M.A. London: B. T. Batsford. 1903.

NOW THAT this country is at last waking up to the importance of science, the practical outcome of which is a large increase in the number of laboratories available for scientific work, we may well predict success for a book giving sound information on the subjects included in the above title.

Neatly bound, well printed upon good paper (features which one justly associates with Messrs. Batsford's publications), the book lacks nothing material to make it attractive, and the contents will not be found to belie the appearance. The first eighty-seven pages are devoted to chemical laboratories. Several plans are given showing the accommodation

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necessary in varying circumstances, and these are followed by a detailed description of the fittings required, aided by several drawings to scale. Chemical benches for students, lecture tables, draught closets, shelves, etc., are carefully dealt with, but we should like to have seen an attempt to discuss the requirements of some of the special branches of the subjects; metallurgical laboratories, special arrangements for organic work, and for the physical branches of chemistry, for example, are dismissed by the author in a few lines, but perhaps limitations, to the size of the volume, has prevented us from benefitting by his experience in these matters. The drainage of a chemical laboratory, so often on a first floor, is another point upon which both builder and architect would often desire more advice than is given in the book.

Pages 88 to 116 are, in a similar way, devoted to Physical Laboratories. The author excludes iron and steel from such laboratories, and where advanced work in magnetism and electricity is contemplated, this is very proper; we do not, however, think it is always necessary, and it would in many cases involve much additional expense in construction. The fittings of a physical laboratory are of a much simpler character than those for chemical work, and this section might have been amplified by some suggestions for suitable wiring, for the supply of current to working benches, transformers, and simple mercury and other switch boards. These are points upon which the profession and the building trades are usually very little informed, and which must be specified for the electricians for this class of work.

The next forty pages of the book give a useful *resumé* of the subjects of ventilation, warming, and lighting, and the volume concludes with the appendices of the Board of Education relating to science teaching.

We think this book, which stands almost alone in the field, will prove of no little service to those who are interested in this important and growing subject.

Lockwood's Builder's, Architect's, Contractor's, and Engineer's Price Book for 1904. Edited by FRANCIS T. W. MILLER, A.R.I.B.A. London: Crosby, Lockwood and Son, 7, Stationer's Hall-court. 1904.

As the Editor remarks in the preface, "the past year has not been a very eventful one in the building trade," consequently he has few variations to note upon the previous edition. Probably owing to the slackness of trade, prices have generally ruled somewhat lower due to the keener competition. This dropping of prices, however, cannot be considered permanent, so that the Editor cannot be blamed for keeping to those generally of 1903. The tendency of price books of a few years ago was to put the prices so much above current rates, as to make them almost useless as works of reference, unless a general discount was agreed upon at the outset; but in the present instance, if any fault is to be found, it is that in some instances they are somewhat lower, particularly in Joiner's Work.

In a work such as this we would rather not see recommendations of special firms, with a reference to the advertisement pages, for the class of work not confined to any particular firm (*vide* p. 321). In the case of specialities, this objection does not apply, but the quotations would be more reliable if the net prices were quoted rather than the list prices. This, of course, opens up the much vexed question of trade discounts, a subject upon which, from the architect's point of view, there ought to be no question. The supplement, which, as heretofore, forms an important proportion of the work, has been revised to date, and thus maintains its usefulness. To sum up, it only remains to be said that the work maintains the high standard of usefulness it has reached during the past few years.

Laxton's Builder's Price Book for 1904. Originally compiled by WILLIAM LAXTON. Eighty-seventh Edition. London: Printed and Published by Kelly's Directories Limited, 182, 183, and 184, High Holborn, W.C.

AN annual publication that has arrived at its eighty-seventh edition, must of necessity merit some degree of respect if only that due to age. The unfortunate thing about most works of so many years existence, is that we have the same old facts dished up year after year in exactly the same form, so that frequently the date is about the only variation from former editions. In the case of "Laxton," happily this objection does not exist, as for some years now a conscientious revision and amplification has taken place, which enables it, notwithstanding the serious rivalry of newer works, to take a high position in the world of price books. One section, in particular, has been brought up-to-date—*i.e.*, "Constructional Engineer," an extremely important one in these days of steel construction. In the present work this has been dealt with most completely, and the new list of standard sections of rolled steel joists, issued last year by the Engineering Standards Committee, will save a good deal of the trouble caused by the variations of sections rolled by the different firms. The paragraphs on "Cutting to fixed lengths," "Rolling margin," and "Economic sections" well deserve study.

In this work, also, the prices of some of the joinery work strike us as somewhat low.

Why will the Editor still perpetuate the erroneous "example," on page 45, which has remained the same, notwithstanding that the rate of wages has risen from 9½d. to 10d., and from 10d. to 10½d., and to which we have before drawn attention. As we understand it, instead of reading "*add* one-nineteenth (or, say, 5¼ per cent.)," it should be "*deduct* one-twenty-first (or, say, 4¾ per cent.)" to bring the rate down to 10d. per hour. A small point certainly, but if given at all it should be given correctly.

This work, nevertheless, keeps up its character of excellence, and is a good example of the benefit of healthy competition.

Proceedings of the Incorporated Association of Municipal and County Engineers, 1902-3. Edited by THOMAS COLE, A.M.Inst.C.E. London: E. and F. N. Spon, Limited. 1903.

THIS year-book contains, as usual, a large amount of useful information, chiefly relating to municipal works in various cities and towns. There are, however, reports of several papers which should be of interest to our readers. Among such, we may mention one upon "Wooden Structures and the Powers of Metropolitan Borough Councils with Respect thereto," by Mr. J. Patten Barber, M.Inst.C.E. The first points for consideration by a municipal engineer in connexion with applications relative to the erection of wooden structures generally, are danger from fire and from the loads which the structures will have to sustain. The author points out that persons applying for licenses do not appear to realise the responsibilities resting upon borough councils and engineers, and he also shows that much difficulty has arisen in the past owing to the imperfect condition of legislation on the subject under consideration. The intricacies of the London Building Act, 1894, are so thoroughly recognised that the author hopes his views "will be received as impressions rather than regarded as dogmatic opinions." As our readers are aware, there is no definition in the Building Act either of a "building" or a "structure," and unless a building is a structure, no borough council can issue a license for the erection of a wooden building. It has indeed been suggested that such bodies have no jurisdiction in the case of wooden buildings, and that their powers relate only to wooden structures. Even when a licence has been obtained from a Borough Council, the builder must give notice to the District Surveyor, who has power to act without consulting the council in any way. Owing to anomalies of this kind, enumerated by Mr. Barber, it seems that builders are subjected to a considerable amount of unnecessary trouble and expense, and we quite agree with the author that the present condition of things is highly unsatisfactory.

Another paper of great practical value is that on "Minimising the Risk of Fire in Temporary Buildings," by Mr. T. W. Aldwinkle. This communication deals almost entirely with temporary hospital buildings. Having briefly described the usual construction of such buildings, Mr. Aldwinkle considers the steps that should be taken to minimise the risk of fire, both in existing buildings and in those to be erected in the future. He devotes attention chiefly to a consideration of the means most suitable for preventing the spread of flame in a given building, or from one building to another. All the suggestions made in this paper are good, but they do not include any points with which architects are not perfectly familiar. It may be regretted that the paper was not extended so as to include various temporary structures, other than hospital buildings, erected in all parts of the country by local authorities and private individuals.

The Year's Art, 1904. Compiled by A. C. R. CARTER. London: Hutchinson and Co. 1904.

THIS useful publication keeps up its old form in the hands of the same editor, but of new publishers. It includes an artist's calendar and diary; a directory of artists; full information as to Art Institutions in England and abroad; a list of fine art dealers in the United Kingdom, and much other information useful to artists. The Editor writes a review of the art of the past year, and Mr. H. H. Statham a special article on "Architecture in 1903." A portrait of Mr. Sargent forms the frontispiece to the volume, which also includes among its illustrations a portrait of Mr. Carter, the Editor, from a painting by Mr. Ellis Roberts exhibited at the Society of Portrait Painters.

BOOKS RECEIVED.

HOW TO JUDGE ARCHITECTURE. By Russell Sturgis. (Macmillan and Co. 6s.)

A HANDBOOK OF TECHNICAL TERMS USED IN ARCHITECTURE AND BUILDING. By Augustine C. Passmore. (Scott, Greenwood, and Co.)

ANCIENT AND MODERN FURNITURE. By John W. Small, F.S.A.Scot. (Eneas Mackay, Stirling.)

THE MUNICIPAL YEAR-BOOK OF THE UNITED KINGDOM FOR 1904. Edited by Robert Donald. (Edward Lloyd.)

THE NORTHAMPTON INSTITUTE.

ON Friday evening last week the prizes and certificates awarded during the session 1902-1903 to students at the Northampton Institute were distributed by Lord Kelvin. Mr. L. B. Sebastian, Chairman of the governing body, presided.

Dr. R. Mullineux Walmsley (the Principal) in his report on the work of the session said that the very specialised work of the Institute did not lend itself well to brilliant results in outside examinations and competitions, but the successes obtained both in examinations and competitions were very gratifying. In the examinations of the City and Guilds of London Institute a number of medals and prizes were obtained, and in the open competitions for the London County Council's scholarships in artistic crafts work fourteen exhibitions and scholarships were obtained as against eight in the preceding year. The Electrical Engineering Department still continued to attract the greater number of students. The laboratories, workshops, and lecture-roms were overcrowded, and a great number of students had to be refused admission. Additional accommodation was, therefore, very urgently required.

Lord Kelvin said that the existence of this Institute was a splendid example of the truth that good deeds are everlasting. The benefactions of 500 and 600 years ago and of the intervening centuries had been turned to account in these days in a manner that he felt sure would have received the approval of those who left the money, could they have foreseen to what purposes their gifts would be applied. He was told that the Northampton Institute received 4,500*l.* towards its support from the City Parochial Foundation That body had two objects—the preservation of open spaces, and the maintenance and extension of education. He believed that the Technical Education Board of the London County Council was the largest contributor to the funds of the Institute. It gave 16,000*l.* towards the building and equipment of the Institute, and made an annual grant of 3,000*l.* The opportunity had been afforded him that evening of inspecting the Electrical Engineering Department of the Institute, and he had been greatly struck with the splendid arrangements they had for imparting scientific instruction to students in the most practical form. The scientific aspects of the Institute's work were most interesting to him. When they thought of the great discoveries of Faraday in England and of Henry in America, and the succession of workers from their time to the present day who had added so much to our knowledge, they could not help being struck with the enormous progress which science had made within a comparatively short period, and perhaps that progress had been even more remarkable and striking at the beginning of

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the XXth century than during the whole of the XIXth Century. Many of these discoveries were for the moment in the realm of pure science, presenting no prospect of practical application; but what was to be thought of a scientific investigator who only looked for an immediate practical application of the result of his labours? The electrical discoveries of Faraday and Henry would never have been made if those great men had contented themselves with asking who will benefit by them. Even at the Northampton Institute he trusted that at least part of the object of the instruction was to give happiness to those who were learning and to give them some insight into the laws of nature. He believed that the everyday workman would be all the happier for knowing something of the laws of nature developed in the work he was called upon to perform. The habit of mind of thinking scientifically and bringing scientific knowledge to bear on the practical work of life would not only contribute to the work being well done, but would largely contribute to the richness and mental wealth of the work. He trusted that the students would learn a good deal at the Institute which would remain with them and be a valuable possession to them as long as they lived.

On the motion of Sir William White, seconded by Mr. James Gavey, a vote of thanks was passed to Lord Kelvin, and, a vote of thanks having been passed to the Chairman for presiding, the visitors were invited to inspect the laboratories and workshops, where specimens of the students' work were shown and demonstrations of the methods employed were given.

ROYAL COMMISSION ON LONDON LOCOMOTION.

AT the sitting of this Commission at the Westminster Palace Hotel last week, evidence was given by the Right Hon. J. W. Lowther, M.P., Chairman of the Committee of Ways and Means in the House of Commons, who explained the procedure taken with regard to private Bills. He did not believe that Parliament would ever consent to hand over to an entirely independent tribunal the ultimate decision and control of such important matters as the routes, etc., of tube railways, nor did he think that important companies, capitalists, or public bodies would be satisfied with anything less than a Parliamentary decision. There were several objections to any tribunal laying down a general scheme for meeting traffic requirements. The work of evolving such a scheme would involve engineering and financial investigations of vast magnitude, and entail a huge staff of highly-paid experts, engineers, legal advisers, electricians, draughtsmen, geologists, and clerks.

Mr. J. L. Pound, Chairman of the London Omnibus Owners' Federation, also gave evidence. He deprecated the practice of placing underground conveniences and lampposts in the centre of the street.

On Friday evidence was given by Lieut.-Colonel R. E. Crompton, C.B., R.E., the Vice-chairman of the Automobile Club. In the course of his evidence he said that one of the cheapest and easiest methods of improving roadways was for the London County Council to buy up corner houses at crossings so as to increase the roadway. The adoption of the American system of tube despatch for light baggage, mails, etc., would also tend to relieve the congestion of the streets.

Earl Russell, London County Council, and a member of the Roads Improvement Association, was then called. There were, he said, many matters of detail by attention to which the capacity of the existing streets could be increased without undue cost. The first of these was the permanent obstruction caused by lampposts, refuges, cab-ranks, and lavatories in the centre of streets. A typical example of the obstruction caused by underground lavatories was to be seen at Wellington-street, Strand. The south-east corner of that crossing was widened by the London County Council at great expense some five years ago, but with little benefit, owing to the planting of an underground convenience, which took up one-third of the roadway, at the very mouth of the approach to Waterloo Bridge. Continuing, witness said that it must be recognised that the streets were too valuable and too expensive to be used by private persons as their goods yards. While the delivery of goods to private houses might be allowed during certain hours of the day, there was no excuse for the blocking of Piccadilly by railway vans or of Arundel-street by newspaper carts. The taking up of the street in that way was no more reasonable than it would be for a builder to claim to mix his mortar in the street. Another method which would increase the capacity of the streets would be to prevent the surfaces being continually taken up by the various bodies who had statutory powers to take them up. Other proposals made by the witness were that there should be provided more viaducts similar to Holborn Viaduct, and also that "Balfour radiating thoroughfares" should be driven from the heart of the town to the outskirts.

Mr. W. Rees Jeffreys, Hon. Secretary Roads Improvement Association, said that he had made a careful study of highway administration for many years. Never in the history of London had there been any uniformity of administration in highway matters. In the Metropolitan Police District there were about ninety independent highway authorities. In the County of London there were twenty-eight highway authorities, exclusive of the County Council and the Office of Works. The general result was that the whole of the Metropolitan Area was "a chaos of mean streets, laid out without design," and enormous sums would have to be paid sooner or later for street improvements. The expensive Strand to Holborn Improvement was a result of the fact that Central London was allowed to be built up by a mass of mean streets and alleys which had to be pulled down to meet the requirements of present-day traffic. All round London streets were being laid out so that they took no share of the through traffic, but merely served to feed the main roads which had existed from mediæval times. In London we had no broadly-conceived administrative schemes such as had been adopted in Berlin, Paris, Vienna, and New York. There was a great need for a single authority exercising jurisdiction over all the means of communication within a radius of at least twenty-five miles of St. Paul's. He went on to describe the duties of such an authority, and suggested that the Metropolitan Water Board should be made the future authority for dealing with the roads and the traffic problem. It was a large body exercising jurisdiction over a very much larger area than any other metropolitan authority, and, when it had once laid down the lines of water administration, it would have very little administrative work to perform. There were two alternatives—a Traffic Commission appointed by the County Councils of London and the surrounding counties, and a commission of experts, with powers of initiative. On the question of tramways, witness said that he considered that tramway companies should not be allowed to turn the roads into tramway stations; termini should be built on land acquired for the purpose.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held on Thursday last week at the City Hall, Charing Cross-road, W.C.

Finance Committee.—This Committee reported that they had received an order from the Local Government Board sanctioning the borrowing of the sum of 4,300*l.* for the purpose of defraying the cost of reconstructing the slipper baths, laying new floors, and other works at the Marshall-street Baths. On the recommendation of the Committee it was agreed to apply to the London County Council for the advance of sums amounting to a total of 52,226*l.* for the carrying out of various works in the City. The principal items were 19,298*l.* for paving works (1903-4), 6,900*l.* for jetties at Grosvenor Wharf, 5,473*l.* for St. George's Place, Knightsbridge, improvement, and 4,600*l.* for remodelling public laundry at Marshall-street. The work at Marshall-street Baths was also included.

The General Purposes Committee reported that they had obtained legal advice in the matter of the Hyde Park-place Houses and Bayswater-road Burial Ground. The opinion expressed was that the legal estate in the land was still vested in the Rector and Churchwardens of St. George's, Hanover-square, but that the beneficial interest in the frontage and houses thereon belonged to the City Council as representing the inhabitants of St. George's Parish; further, that any new building agreement should be granted by the Rector and Churchwardens with the consent of the Local Government Board. On the recommendation of the Committee it was agreed to submit certain proposals to the Rector and Churchwardens, one of the proposals being that they (the Rector and Churchwardens) should undertake the maintenance of the burial ground.

Works Committee.—On the recommendation of this Committee it was agreed to carry out the work of repaving the following streets:—Broad Sanctuary (side and rear of Guildhall), Chandos-street, Chester-terrace (Elizabeth-street to Eaton-terrace), Coach and Horses-yard, Cockspur-street, Duncannon-street (from Charing Cross 31 yards eastwards), Endell-street, King William-street (Chandos-street, Strand), Pall Mall East, Piccadilly-circus, (granite part south side), Trafalgar-square (north and east). The selection of the material to be used in each case (excepting Piccadilly-circus, south side, which is to be paved with 4-in. Mount Sorrel granite) was deferred until the tenders were received. The Committee reported that they had instructed the City Engineer to pave the cab-rank on the north side of Duncannon-street with asphalte. A further report by the Committee stated that they had received a report from the City Engineer that certain contracts with the Improved Wood Pavement Company for the maintenance of a total area of 25,094 square yards of wood paving at 1s. per yard per annum expired on December 31, 1903; that the Company had written stating that they were prepared to enter into a further contract for the maintenance of such roadways for a period of fifteen years upon the same terms and conditions as their previous contract. The Committee understood that there was an area of some 1,360 square yards of wood paving in Chancery-lane, the contract for maintaining which expired some time since. They were of opinion that the system of entering into long-term maintenance contracts was undesirable, as, by reason of the contracts, the Council had not been able to exercise that amount of control which was necessary. They recommended and it was agreed "that in cases where contracts for the maintenance of the paving of carriageways have expired the Council do themselves maintain the roadways, and that the Improved Wood Pavement Company be informed accordingly."

The following recommendation of the Committee was agreed to also:—"That the Council do deduct the full penalties provided for by the contract from the moneys due, or to become due, to Messrs. Mowlem and Co. in respect of the delay beyond the specified time for completion of the paving of Northumberland-avenue, subject to any allowance which the City Engineer may think fit and reasonable to make pursuant to the contract." The Committee, in their report, stated that "Messrs. Mowlem and Co. were, pursuant to their contract, required by the City Engineer in writing to commence the paving of Northumberland-avenue on August 10, 1903. The request was not complied with, and, notwithstanding repeated communications, the work was not commenced until October 12. Thus the work remained uncompleted for forty-eight days beyond the specified period for completion."

Sewer Works.—The Town Clerk was instructed to advertise for tenders for the reconstruction of the following sewers:—Alfred-street, estimated cost 200*l.*; Arthur-street, estimated cost 1,300*l.*; Chapel-place, estimated cost 2,200*l.*; Lancelot-place, estimated cost 1,100*l.*; Middle-street, estimated cost 800*l.*; Montpelier-row, estimated cost 1,600*l.*; Montpelier-square (north), estimated cost 1,350*l.*; Montpelier-street, estimated cost 1,100*l.*; Raphael-street, estimated cost 1,100*l.*; Rutland-street, estimated cost 1,100*l.*; Sterling-street, estimated cost 650*l.*; Trevor-square, estimated cost 1,100*l.*; Vauxhall Bridge-road, estimated cost 1,200*l.*; Warwick-street, estimated cost 900*l.*; contingencies, estimated cost 2,000*l.* The total estimated cost was 17,700*l.*

Street Lighting.—It was agreed to accept the offer of the Gas Light and Coke Company to instal and maintain incandescent gas lighting in the streets of the City now lighted with flat flame burners, for the sum of 2,763*l.* The number of lamps affected is 1,259, and it is estimated that the saving to the Council will be 62*l.* per annum, for the first five years, and 615*l.* per annum after that period.

Victoria Station Enlargement.—The Works Committee submitted a report from the City Engineer in which that officer stated that he had communicated with Messrs. Mowlem and Co., the contractors for the Victoria Station Enlargement, pointing out that great inconvenience is caused by the closing of Elizabeth Bridge in connexion with the enlargement, and suggesting that the provision of temporary footway would to some extent obviate the inconvenience. The contractors had intimated that the delay has been caused by the tardy delivery of ironwork. The City Engineer had again urged Messrs. Mowlem and Co. to provide a temporary footway, but no reply had been received.

On the recommendation of the same Committee, the Mayor and Councillor C. Spencer, the Chairman of the Committee, were appointed delegates to represent the City Council at the proposed deputation to the London County Council of representatives of Borough Councils north of the Thames in regard to the question of flooding and the inadequacy of the main drainage. The Housing Committee reported the receipt of a letter from the London County Council regarding the closing of insanitary houses, and pointing out that the "Housing of the Working Classes Act, 1903, contained a provision to the effect that, if, in the opinion of any local authority, any dwelling-house is not reasonably capable of being made fit for

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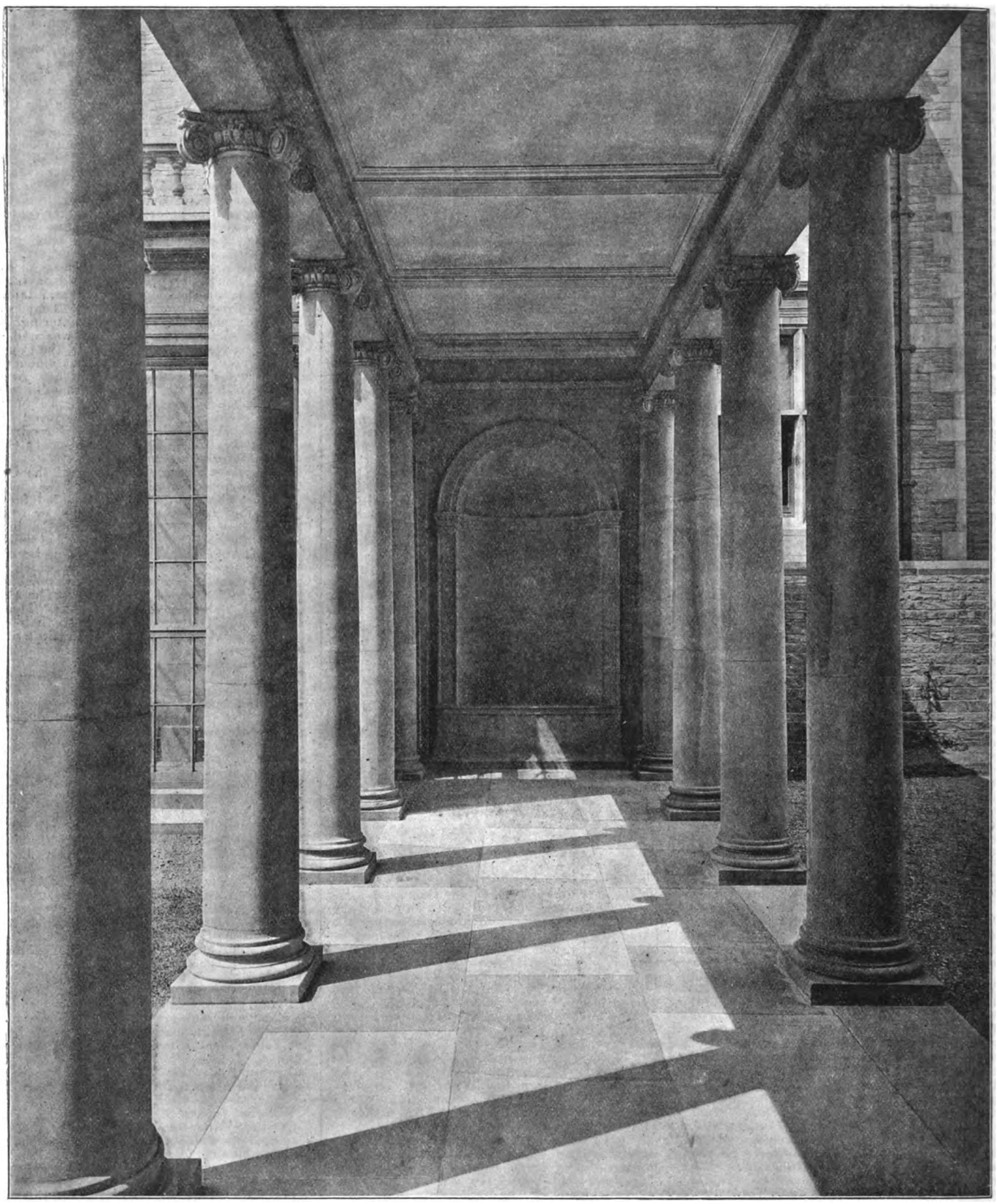

House at Scarborough: The Loggia.

human habitation, or is in such state that the occupation thereof should be immediately discontinued, it shall not be necessary for them before obtaining a closing order to serve notice on the owner or occupier of the premises to abate the nuisance. In respect of a letter from the London County Council in regard to the Wardour-street Improvement, it was agreed to inform that body that it had not been found practicable to carry out the entire scheme, but that it was the intention of the City Council to complete the improvement as opportunity occurred. In regard to a suggestion of the London County Council that the actual line of any street improvement, to which that Council had agreed to contribute, should be staked out in strict adherence to the approved plan, and in the presence of an official from the Council's Engineers' or Architects' Department, it was agreed to accede to the request on condition that the County Council would undertake to send a similar intimation to the City Council in cases of improvements undertaken by them within the City of Westminster, and towards the cost of which the City Council had agreed to contribute, so that one of their officials should be present.

Having transacted other business, the Council adjourned shortly after 6.30.

CARPENTERS' HALL LECTURES.—Our report of Professor W. Schlich's lecture on "The Forestry Problem in the United Kingdom" at Carpenters' Hall is unavoidably held over until next week.

Illustrations.

HOUSE AT SCARBOROUGH.

THIS house, called "Red Court," was erected in 1901, and occupies a position on the Esplanade with fine views of Scarborough Castle and Harbour on the one hand and Filey Brigg on the other.

The materials used in its construction were Sileby sand-faced bricks, stone from the neighbourhood of Kirby Moorside, and Portland cement for the external cornice; the roofs are covered with green Westmorland slates. The

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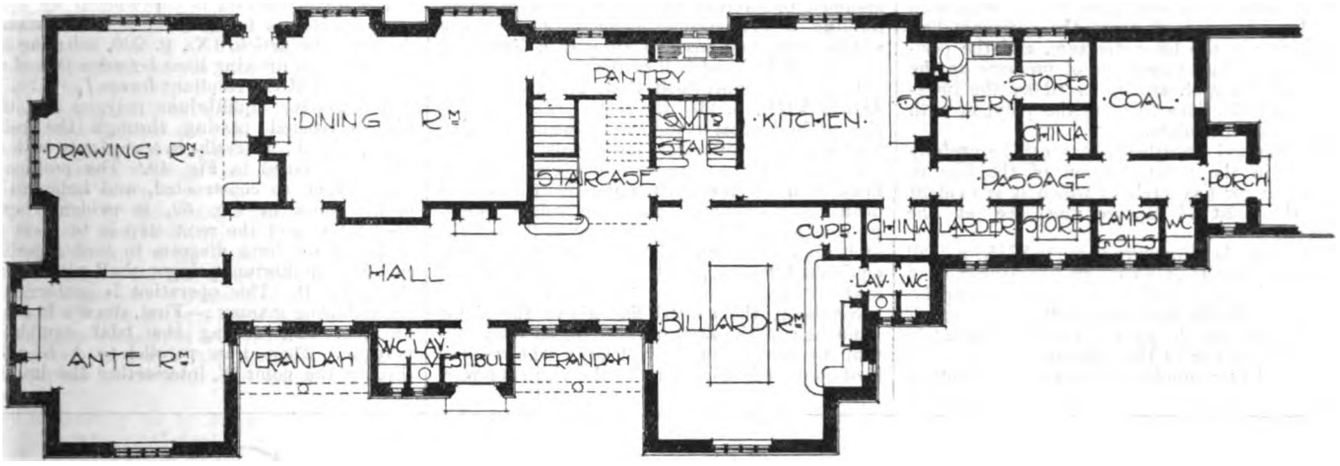

A Country House. Plan.

general contractors were Messrs. W. Nicholson and Sons, of Hunslet, and Mr. R. E. Huggan was clerk of works. Messrs. F. W. Bedford and S. D. Kitson, of Leeds, were the architects.

A COUNTRY HOUSE.

THIS house, designed by Mr. A. H. Crawford, of Edinburgh, was unfortunately not carried out.

It was designed to be built with hand-made red facing bricks, and roofed with dark blue and brown roofing tiles, using the run of the kiln and mixing the various shades.

CHURCH, CLIVE, NEAR SHREWSBURY.

THIS is a perspective of a church designed by Mr. C. J. Ferguson, of Carlisle. Owing to illness, the architect has been prevented from sending us a plan and description to accompany the view.

SCULPTURE: "THREE GENERATIONS."

THIS poetic and suggestive group was submitted by the sculptor, Mr. Leonard Jennings, in competition for the sculpture gold medal at the Royal Academy this year. As far as artistic ability is concerned, in our opinion it merited the medal, and we believe this opinion had supporters within the Academy; but it must be admitted that it does not exactly answer to the idea obviously intended in the wording of the subject given by the Academy:—"Three Generations": viz., figures of childhood, manhood (or womanhood), and age. Mr. Jennings took a more poetic view of the subject, and perhaps this lost him the medal, as the Council were justified in considering that the subject as they put it should be treated, and not a variation on it.

In regard to the intention of the work the sculptor writes:—

"I think perhaps 'The Three Generations of Time' would be a more explanatory title. My intention was an allegory of the Past, Present, and Future. The inscription around the base I think would help the understanding of my work—viz., 'Out of the Present grow the Past and the Future.'

"The groups around the lower part represent the Present, in the front Love, at the back Death, and at the two sides the emotions of Life. All the groups are designed to lead to the figure at the back—viz., Death. Out of the Present grows the tree of generation, bearing the Future as its fruit, and supported by the figure of the Past."

DESIGN FOR WAR MEMORIAL TO OLD CLIFTONIANS.

THIS design, which was exhibited in last year's Royal Academy, was submitted in a limited competition for a memorial to Old Cliftonians who fell in the late South African War.

The instructions to the competitors fixed a site on the terrace separating the quadrangle from the College Close, and stated that the memorial should include, on four sides, panels to receive metal plaques, one a bas-relief towards the Close, one an inscription facing the quadrangle, and two (facing up and down the terrace) to contain the names of those to whose memory the monument would be erected.

The design illustrated shows a monument intended to be carried out in Portland stone. For the plaques on each side, bronze appeared to be the most suitable metal, being a dignified material and valuable both in tone and texture. It was intended that the inscriptions should be in raised letters, gilt on the bronze, thus imparting a certain warmth of colour.

In like manner the bas-relief was to be in bronze similarly treated. It was felt that a symbolical figure such as indicated would be more appropriate to a memorial of this kind than any endeavour to depict, in sculpture, scenes of modern fighting.

The total height of the monument as shown is 25 ft. 8 in. above the general level of the quadrangle; the base occupies a space of about 8 ft. 4 in. square, exclusive of the steps.

Advantage was taken of the difference between the level of the quadrangle and that of the Close to introduce a drinking fountain, easily accessible to those at play, who might thus, by the water of life, be reminded of those who had fallen for their country.

W. L. LUCAS.

COMPETITIONS.

KIRKCALDY SCHOOL BOARD.—The design by Mr. D. Forbes Smith, Architect to the Dysart School Board, has been placed first by the assessor in a competition for an elementary school of two stories to accommodate 1,000 pupils, including cookery and laundry departments, for the Kirkcaldy School Board. The design has been accepted by the Board.

The Student's Column.

ARCHES.—X.

A USEFUL variation of the method described in the preceding article may be applied for the special purpose of finding a line of resistance that will pass through three specified points in an arch.

For the purpose of making matters clear, we will take as an illustration the semi-arch which has already been under discussion, selecting the points a and a', Fig. 49, as those through which the line of resistance shall pass. The first of these points is at the upper limit of the middle third of the crown joint, and the second is at the lower limit of the middle third of joint No. 4. As this semi-arch is of the same dimensions as that shown in Figs. 46 and 47, and is assumed to be under precisely the same conditions of loading, the values and positions of the external forces are those stated in Table I., p. 200.

The method now under consideration is entirely graphical, and the first step is to construct a series of lines representing the resultants of the vertical and horizontal forces by laying off from the point P, as shown in the force diagram, Fig. 50, the vertical forces $w_1 \ldots w_8$, and the horizontal forces $h_1 \ldots h_8$, as explained on p. 229. Then the connecting lines $f_1 \ldots f_8$ represent the directions and values of the resultant forces acting upon the several voussoirs in Fig. 49.

As the load is symmetrical, the crown thrust may be taken, as before, to be horizontal. Therefore, we take any point O′, at a sufficient distance from and horizontally opposite to the point P, and draw radial lines $R'_1 \ldots R'_4$, from O′ to the upper extremities of f_1, f_2, f_3, f_4 respectively. The series of radials need not be continued beyond f_4, because at present we are only concerned with the voussoirs down to the point a' in the required line of resistance.

A tentative equilibrium polygon should next be constructed by drawing through a, in Fig. 49, a line parallel to the line O′ P in Fig. 50. This line must be continued so as intersect f_1 at the point b in the first voussoir. Through the point b draw a line parallel to the radial line R'_1 in Fig. 50, intersecting f_2 at the point c in th esecond voussoir; similarly, from the point c draw a line parallel to R'_2, intersecting f_3 at the point d; from the point d draw a line parallel to R'_3, intersecting f_4 at the point e; and from the point e draw a line $e f$ parallel to R'_4.

Produce the lines $f e$ and $a b$ until they meet at the point r, as shown by broken lines in Fig. 49. Then in accordance with mechanical principles, r is a point on the resultant of the forces f_1, f_2, f_3, and f_4.

It is evident that the portion of the semi-arch between the crown joint and joint No. 4 is in a condition of equilibrium under the action of (1) the horizontal thrust Q; (2) the resultant of the external forces; and (3) the reaction of joint No. 4. As the lines of action of the horizontal thrust Q and of the resultant of the external forces intersect at the point r, and, as the required line of resistance must pass through the point a' in joint No. 4, the line $a' r$ represents the direction of the resultant reaction of that joint.

Now, turning to Fig. 50, we draw the line R_4 parallel to the resultant $a' r$ in Fig. 49. This line commences at the upper extremity of f_4 and intersects the line O′ P at the point O. The line R_4 then graphically represents the reaction of joint No. 4, to the scale already adopted in the construction of the force diagram. The line O P represents the horizontal crown thrust corresponding to the required line of resistance passing through the points a and a' in Fig. 49, and a line drawn from the upper end of f_4 to the lower end of f_1, in Fig. 50, would represent in direction and amount the resultant of f_1, f_2, f_3, and f_4. This line is not shown owing to the small dimensions of the diagram.

Having determined the value of the crown thrust, the force diagram is completed by drawing the lines R_1, R_2, R_3, R_5, R_6, R_7, R_8, and a new equilibrium polygon can be constructed from these lines and the line R_4, previously drawn, in the manner already described. This polygon is shown in Fig. 49. The amount

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of the pressure on any joint of the semi-arch can be measured off from the corresponding radial line in the force diagram, and the positions of the various centres of pressure on the joints of the arch are indicated by the intersection of the lines forming the polygon with the lines of the joints.

The method described above can be usefully applied in the determination of the line of resistance for any arch in which it is evident that the joint of rupture must be at the springing.

As the angle of rupture (Article VIII., p. 200) is rarely more than 45 degrees measured from the horizontal, it follows that, if the angular distance from the springing to the crown is less than 45 degrees, the joint of rupture may safely be assumed to be at the springing.

We will now inquire briefly into the method to be adopted for dealing with arches under unsymmetrical loads. Under such conditions of loading it is impossible to directly determine the line of resistance for an arch. The amount, point of application, and direction of the thrust at the crown cannot be known, nor can any satisfactory hypothesis be evolved by which they may be determined, and, further, nothing can be known as to the position of the joint of rupture. It is certain, however, that the crown thrust cannot be horizontal, and that it is not applied at the upper limit of the middle third of the crown joint.

The method described below may be usefully employed to find a line of resistance for an arch under unsymmetrical loading, although it does not indicate which of the many possible lines may be the true line of resistance.

As an example we will take the case of the segmental arch shown in Fig. 51, which is assumed to support an embankment of earth forming a symmetrical dead load over the whole span, and also to support a live load over the right-hand half of the span.

It will be understood that, as explained in Article VIII., p. 200, the earth pressure gives rise to horizontal components, while the live load gives rise to vertical forces only.

In Fig. 51 the curved line above the left-hand half of the arch indicates the actual dead load reduced to an equivalent homogeneous load of the same density as that of the arch ring. This curve is the upper limit of the equivalent loading, and is termed the *reduced load contour*.

Similarly, the curved line above the right-hand half of the arch is the reduced load contour for the dead and live loads. The reduced load contour in Fig. 51 is for the vertical forces, the horizontal and vertical components being laid off in the force diagram, Fig. 52.

The manner in which the load contour may be obtained is explained at the end of this article.

The arch and its loading are divided into eight sections, as indicated by broken lines in Fig. 51, where also are shown the directions of the resultant forces $f_1 \ldots f_8$ parallel to the corresponding lines in the force diagram, Fig. 52.

We will now proceed to construct a trial equilibrium polygon passing through the following three points :—

A, the lower limit of the middle third of the springing joint at the right-hand end of the arch ;

C, the middle of the crown joint ; and

B, the upper limit of the middle third of the springing joint at the left-hand end of the arch.

The force diagram is constructed by laying off the external forces from P in the manner described in Article IX., p. 229, selecting any point O′ and drawing lines between O′ and the extremities of the resultant forces $f_1 \ldots f_8$.

A tentative equilibrium polygon can thus be constructed passing through the points A, C′, and B′, generally in accordance with the method pursued in Fig. 49. The position of the polygon so constructed, and indicated by broken lines in Fig. 52, is evidently quite unsuitable, and the next step is to move the centre of the force diagram to such a position that the equilibrium polygon shall pass through the point B. This operation is performed in the following manner :—First, draw a line A B′ (in Fig. 51), closing the trial equilibrium polygon. Then draw parallel to A B′ a line through the point O′, intersecting the load line at the point N. Now draw (in Fig. 51) a line A B connecting the two extremities of the required line of resistance, and from the point N in Fig. 52 draw a line parallel to A B.

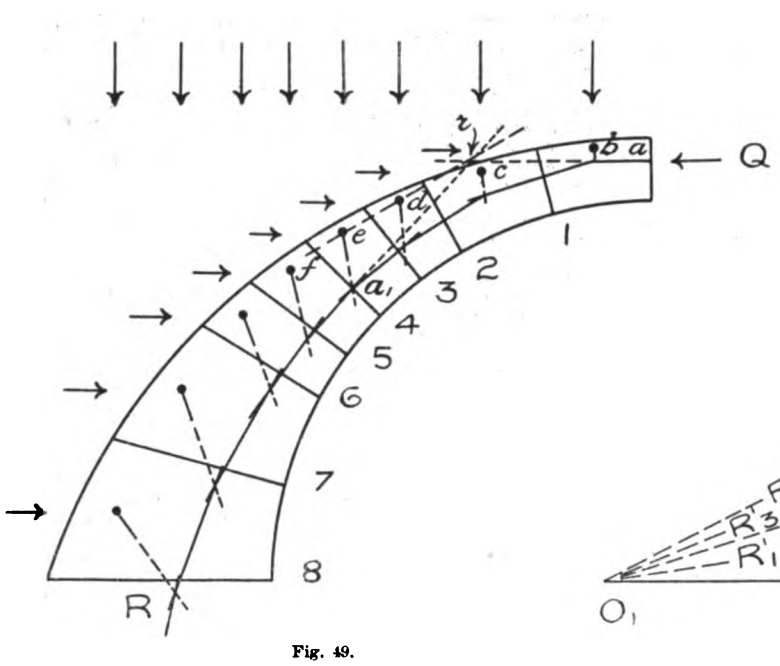

Fig. 49.

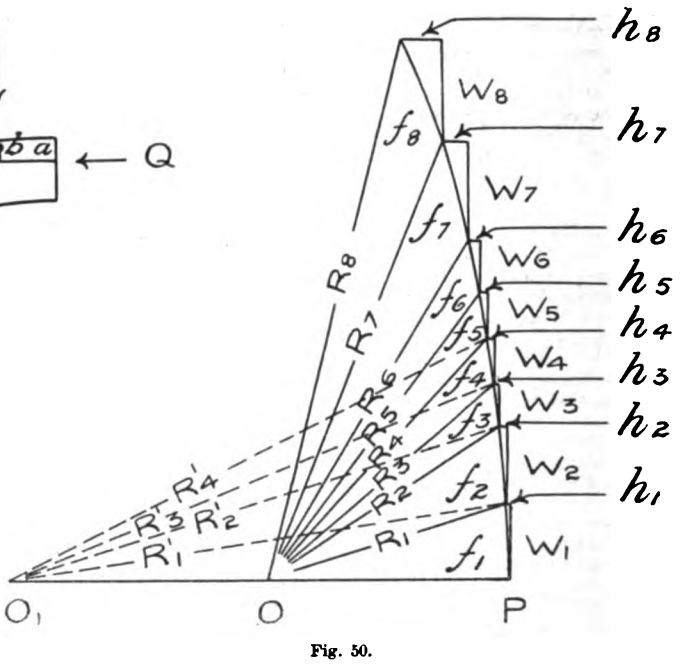

Fig. 50.

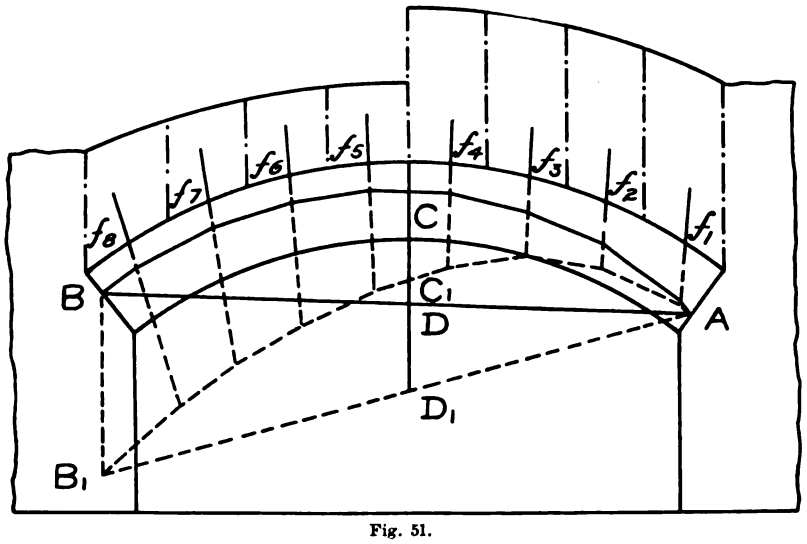

Fig. 51.

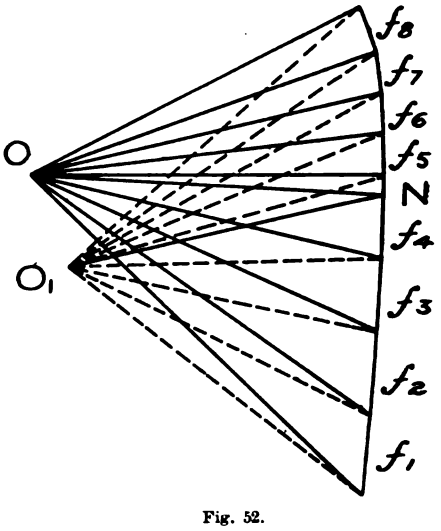

Fig. 52.

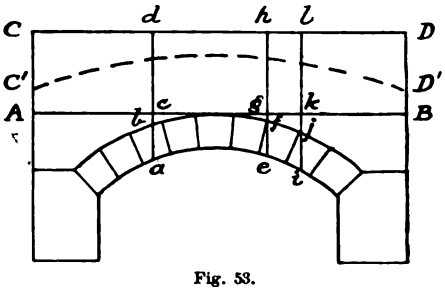

Fig. 53.

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The new centre O of the force diagram will be found at a point on this line at such a distance from N that N O : O′ x as C′ D′ : C D, where x is a point on the load line horizontally opposite the point O′.

From the point O so determined draw lines to the extremities of the resultant forces f_1 . . . f_8, and construct a new equilibrium polygon passing through the points A, C, and B in Fig. 51.

If the line of resistance obtained from this polygon does not lie entirely within the middle third of the arch ring, some other positions must be selected for the three points A, C, and B, and a fresh line of resistance must be constructed. If this in turn does not lie within the prescribed limits, it will then be necessary to alter the section of the arch ring, and to make further trials until the desired result is attained.

Before passing on to other theories of the arch, it may be convenient to refer to methods of finding the centre of gravity of the combined weight of a voussoir and the section of the load resting upon it. The centre of gravity of the voussoir itself can be found by the usual mathematical methods, and the centre of gravity of the section of the load resting upon it may be taken as acting through the middle vertical line.

The centre of gravity of the two masses can be determined by the following formula :—

$$x = \frac{w_1 x_1 + w_2 x_2}{w_1 + w_2}$$

where x = horizontal distance from any given point to the vertical line through the centre of gravity of the combined masses ; w_1 and w_2 = the weights of the two masses ; and x_1 and x_2 = the horizontal distances from any given point to the vertical lines through the centres of gravity of the separate masses.

This method can be employed for finding the centre of gravity of any number of masses if the corresponding terms are inserted in the numerator and denominator of the foregoing equation.

Another method of finding the centre of gravity of each voussoir of an arch and its load is that to which reference has already been made so far as the reduced load contour is concerned. The total load, including the weight of the voussoirs, is first reduced to an equivalent homogeneous load of the same density as the arch ring. Any superimposed load can be dealt with by this method, whether entirely of earth or masonry, or partly one and partly the other, and a live load can be treated in a similar manner.

As an example, we will take the arch shown in Fig. 53, where the load consists partly of masonry and partly of earth.

It is required, first, to find the reduced-load contour which gives the upper limit of the equivalent loading.

We will assume the weight of the stone forming the arch ring to be 160 lb. per cubic foot ; that of the masonry backing to be 140 lb. per cubic foot ; and that of the earth to be 100 lb. per cubic foot. Take any point a on the intrados of the arch ring, and draw the vertical line a d, cutting the extrados at b, and the division line between the masonry and earth at the point c.

Then the value of the ordinate at a to the reduced load contour will be :—

$$a\,b + b\,c\,\frac{140}{160} + c\,d\,\frac{100}{160}$$

The value of the ordinate must be calculated and laid off to scale on a diagram. In the present case it suffices for our purpose to take the value as equivalent to a d' in Fig. 53.

Ordinates computed at the points e and i are similarly assumed to possess the values e h' and i l', and ordinates computed at a sufficient number of other points are assumed to give the reduced load contour C′ D′.

Then the area between the intrados of the arch and the load contour is proportional to the total load upon the arch.

If the right-hand half of the arch were subjected to a live load in addition to the dead load, as in Fig. 51, the live load could similarly be reduced to an equivalent load of masonry, and the reduced load contour would then be represented by a higher curve parallel to the right-hand half of the curve C′ D′, as shown in Fig. 51.

The centre of gravity for each voussoir and its load can be found by making a large scale drawing of the arch ring and its load contour ; then, by cutting out the area upon which is represented each voussoir and its load, the centre of gravity can be determined by experiment. The position when thus found should be indicated upon the drawing of the arch.

COURT OF COMMON COUNCIL.

THE usual Court of Common Council was held on Thursday last week at the Guildhall, the Lord Mayor presiding.

Among the petitions received was one from the inhabitants of the wards of Vintry, Dowgate, and others urging the widening of Joiners' Hall-buildings, or Bell Wharf-lane, Upper Thames-street, so that a double line of vans could pass, and pointing out that the present would be a favourable opportunity for effecting an improvement, inasmuch as the premises that would have to be acquired are about to be pulled down and rebuilt. The petition was referred to committee for report.

It was agreed to oppose the following Bills in this Session of Parliament :—Thames River Steamboat Service, Thames Steamboat Trust, East London and Lower Thames Electric Power, Great Northern and City Railway (extension of time), Metropolitan Railway, and Metropolitan District Railway.

On the recommendation of the Streets Committee the amended regulations with regard to projecting lamps, clocks, cranes, boards, and tablets were agreed to. It will be remembered that the amendments were the outcome of a petition of the London Chamber of Commerce and certain makers and users of lamps and signs carrying on business within the jurisdiction of the Corporation.

The Chairman of the Bridges Committee was asked if he could explain how it was that part of the carriageway of London Bridge was being paved in red granite, and the rest in grey granite. The questioner said that he understood that grey granite was the more durable material.

In reply, the Chairman of the Bridges Committee said that it was a fact that part of the bridge was being paved with red granite, but the contract did not specify what colour material was to be used ; it merely said "the best Aberdeen granite."

Replying to a further question, he said that it was hoped that the improvements on the bridge would be completed by March 20, or a fortnight within the contract time.

A report was read from Sir H. Homewood Crawford, the City Solicitor, on the question of the raising of a City Rate for the erection of the new Central Criminal Court.

Mr. Benjamin Turner moved a resolution to the effect that the City Solicitor should be instructed to take the necessary steps to sustain the rights of the Corporation in the matter, and, further, that the Remembrancer should be instructed to promote a Bill in Parliament to remove all doubts as to the rights of the Corporation to obtain a loan and make a rate for the purpose in question.

This was seconded by Mr. Barber and carried.

OBITUARY.

MR. GORDON-SMITH.—We regret to announce the death on February 23, at his residence, No. 5, Oakhill-road, Putney, S.W., of Mr. Percival Gordon-Smith, in his sixty-fifth year, late Architect to the Local Government Board. Mr. Gordon-Smith was elected an Associate of the Royal Institute of British Architects in 1866, and a Fellow in 1879, and he served for a while as a member of the Council. He was also a Fellow of the Surveyors' Institution. Mr. Gordon-Smith entered the service of the Poor Law—since the Local Government—Board under Christopher Wren Savage, whom he eventually succeeded as Architect to the Board, and retired after about forty years' service in June, 1901, being succeeded by Mr. Brook Taylor Kitchin. He acted on several occasions as assessor or professional adviser in some important competitions, amongst them being those for the Cameron Memorial Accident and General Hospital at West Hartlepool, the St. Mellon's Infectious Diseases Hospital, and the Chorlton and Manchester Joint Asylum Committee's Colony for Inebriate and Epileptical Patients at Langho. In February of last year he acted as adviser to the Infirmary Committee of the Newark Board of Guardians upon the competitive plans submitted for the extension buildings of the Newark Infirmary. In the competitions we cite his recommendations and awards were severally adopted. Shortly after his retirement from the Local Government Board, Mr. Gordon-Smith brought out a work entitled "Hints and Suggestions as to the Planning of Poor Law Buildings, etc.," published by Messrs. Knight and Co. After the death of Mr. Arthur Cates, Mr. Gordon-Smith was elected in May, 1902, to fill the vacant seat on the board of directors of the Architectural Union Company.

MR. BEVAN.—We have also to announce the death at Brislington of Mr. John Bevan, of No. 1, St. Stephen's Chambers, Baldwin-street, Bristol, aged sixty years. Mr. Bevan had practised in Bristol for a period of from thirty-five to forty years, and was architect of several churches in that city and the neighbourhood, including those of St. Francis, at Ashton-gate, Bedminster, in 1889, and St. Alban, in the same locality, in 1885. He designed the new nave for the Church of St. Michael and All Angels in Bedminster, and carried out the alterations and repairs, with new roofs and redecoration, of the Church of St. Andrew in Montpelier, Bristol, twenty years ago.

MR. J. D. COOPER.—On Saturday last there passed away the veteran wood-engraver, James Davis Cooper, at the advanced age of eighty-one. Educated at the City of London School, he, at an early age, became the pupil of Whymper, and rose quickly to the head of his profession. Ever keen to recognise what was beautiful and good in art, he has been often the first to give the helping hand to struggling artists, whose names are now well-known. With him also originated the idea of blending illustration and type—the first example of which, Mrs. Barbauld's Hymns in Prose, was brought out in 1863, by Mr. Murray. He, struck by the beauty of "Washington Irving's" writings, planned to illustrate, after the same manner, "Old Christmas," and "Bracebridge Hall," and in this way so ably assisted the late Mr. Caldecott in his pen and ink designs. These were published by Macmillan and Co. His work brought him in contact with some of the most famous men of the day, and caused his name to be connected with those of Darwin, Huxley, Tyndall, Owen, Nasymth, Livingstone, Stanley, Nansen, and many others, in their books. Mr. Cooper had also the distinction to be frequently selected by Her Majesty, the late Queen Victoria, to engrave for her books such as "Our Life in the Highlands," also for "The Prince of Wales' Tour in India." Some eighteen to twenty years ago Mr. Cooper engraved several important plates for this journal, which were in the highest style of wood-engraving, and were among the best executed architectural illustrations that have ever appeared in our pages ; we may mention especially one of Keble College Chapel, and one of a fine Mairie, one of the Paris arrondissements. The introduction of Process was practically the death-blow to wood-engraving, and this, added to his failing eyesight, caused him to retire from work some years ago. His intellect remained unclouded to the last, and his wonderful memory of all that was worth recording in an eventful life, combined with his charming old-world manners, made up a personality difficult to replace.

GENERAL BUILDING NEWS.

CHURCH OF ST. MARY, AUGHNACLOY, DIOCESE OF ARMAGH.—The foundation-stone of this building was laid on the 28th ult. The church is in the Romanesque style, freely treated, and following such native types as are found in the round-arched work at Jerpoint Abbey, co. Kilkenny, and the still earlier examples at Melifont, Glendalough, and other ancient remains. The detail of ancient Irish work was, however, deemed to be of too archaic a character for literal adoption, and the great Lombardic churches of Northern Italy have suggested the general treatment of the detail. The work has been chiefly concentrated in the west front. A massive tower surmounted by a copper-domed cupola shows on the principal façade of the church. The principal feature of the west front is the central doorway, deeply recessed in successive orders of moulded arches carried on circular shafts with carved capitals of Italian character and moulded bases. Over the chief entrance is a circular rose-window, in the centre of which will be a carved-stone representation of the Crucifixion. The church consists of nave, aisles, and a circular apsidal chancel, and two sacristies. Transepts are avoided in order to realise a plan where all can see the officiating priest. The desirability of a large uninterrupted floor-space near the altar has been kept in mind. The organ gallery is not provided in the present scheme, but it will be placed in the western end of the nave, over the principal entrance. The entire church will provide seating accommodation for some 500 persons, while if the nave only were seated, and the aisles used for standing space, the accommodation would be raised to about 800 or more without crowding. The church is well lighted from every side. A heating chamber is placed under the sacristies. Irish, and as far as possible local, materials are being used throughout. For the facing and general walling the local freestone cannot be surpassed for appearance and durability. It has been sought to gain effect by the good

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proportion of well-studied masses rather than by the elaboration of ornamental detail. The joinery work is all of the simplest character, the roofs being covered by timber barrel vaults of strong and plain construction. The church is being erected by Mr. Robert Cullen, builder, Portadown, from the designs and under the supervision of the architects, Messrs. Doolin, Butler, and Donnelly, of Dublin.

RESTORATION OF BASSALEG CHURCH, MONMOUTHSHIRE.—The Church of St. Basil at Bassaleg, near Newport, which had been closed for worship for over twelve months during a period of thorough restoration, has just been reopened. The church has been much altered from time to time; in fact, nearly every vestige of the original building has been swept away. The tower is, nevertheless, intact, and the original chancel walls remain, although modern windows have been introduced. The tower is a fine example, and has been restored by public subscription. The restoration includes re-building of the top portion, pointing the walls, restoration of windows, etc., new lead flat, re-hanging of the bells, with the addition of a chiming apparatus, new floors, new west door, removal of organ, and the opening out of the fine old arch between tower and nave, filling in this with a rich oak screen, thus forming a choir vestry in the lower portion of the tower. The clock works have also been repaired and fixed in a more suitable position. The roofs of the nave, south aisle, vestry, and Lord Tredegar's pew and vault have been repaired and re-slated, the nave roof lifted to its original height, and the interior of the nave and aisle boarded and formed into panels with moulded ribs. A new organ-chamber has been added at the east end of the aisle, and the organ removed from the west end of the nave into it, the choir being formed in front of it, facing north. A new heating-chamber was built on the north side, and a hot-water apparatus on Musgrave's latest principle fixed. New decorated fret-lead glazing has been put in all the windows, and a new painted window fixed on the north side of the nave to the memory of Captain Homfray, by Savell, of Albany-street, London, who also supplied the glass. The flags in the passages were all taken up and re-laid on concrete in cement, and the walls have been decorated in a warm buff colour, with ornament in venetian red. The Commissioners restored the chancel, which included the re-building of a portion of the walling and a new oak roof, etc. The work was carried out by Messrs. Shepton and Son, of Cardiff, from designs and under the supervision of Mr. C. B. Fowler, F.R.I.B.A., of Cardiff.—*Western Mail.*

PRESBYTERIAN CHURCH, OLDPARK, BELFAST.—The memorial-stones in connexion with the new church which is being built on the continuation of the Cliftonville-road to Oldpark were laid recently. The plan comprises a nave of 90 ft. in length, with galleries and shallow transepts. The latter, with 30 ft. of the nave, will be used at present as a school and lecture hall. The main front will have a square tower, with heavy buttresses, surmounted by a battlemented cornice, with brick spire above, rising to a height of 110 ft. above street level. The contractors for the entire work are Messrs. W. J. Campbell and Son, and the architects are Messrs. Young and Mackenzie, Belfast.

SYNAGOGUE, BELFAST.—The Lady Mayoress of Belfast (Lady Jaffe) laid the foundation-stone of a new Jewish Synagogue for the Hebrew congregation of Belfast. The new building will occupy a site about 90 ft. by 50 ft., in Annesley-street. The plan comprises a porch and vestibule at the west end, giving access to the synagogue, which is 75 ft. long by 37 ft. wide. The synagogue will accommodate upwards of 350 persons, with a gallery to hold 200 in addition. Messrs. James Henry and Sons are the contractors, and Messrs. Young and Mackenzie the architects.

BOARD SCHOOLS, CRAYFORD.—New schools, to be called the North End Schools, have just been completed, and will shortly be opened. The schools are built with a wide corridor for assembling the children, instead of a central hall, and provide accommodation for 300 children in two departments, with provision for future class-rooms to accommodate 100 children. There are separate entrances for boys, girls, and infants. The buildings throughout have been built with yellow stocks and red-brick dressings, and Box ground stone for copings, cornices, and dormers. The class-rooms internally are lined with salt-glazed brick dadoes, and are heated by warm-air grates, with low-pressure hot-water pipes and radiators to hat and cloak rooms and corridors. Covered playsheds are provided for girls and infants, and also in the boys' playgrounds. The cost of the schools is 5,358*l.*, including playgrounds, boundary-walls, and fencing to a site of 1½ acres. The architect is Mr. C. L. Morgan, of London, and the builders Messrs. Friday and Ling, of Erith.

SCHOOL, MEXBOROUGH.—On the 29th ult. a new school was opened in Mexborough. Mr. G. White, architect, gave a few particulars as to the new buildings. The accommodation is for 320 mixed scholars, and the total cost, including furnishing, etc., 3,801*l.*

INFECTIOUS DISEASES HOSPITAL, CONISBOROUGH.—The new Infectious Diseases Hospital, which has been built at Conisborough by the Doncaster and Mexborough Joint Hospital Board, is situated in Common-lane, at Conisborough, about three-quarters of a mile from the railway station. The buildings consist of an administrative block, comprising rooms for the use of the medical officer, the matron, and the nursing staff, with kitchen and store accommodation. This block is more than sufficient to meet the present requirements, and it has been built with a view to future extension of the wards. The scarlet fever block consists of male and female wards, with two special wards containing one bed each for paying patients, with convalescent room over the central portion, provided with nurses' the central portion, provided with nurses' room, bathroom, and sanitary accommodation. There is also typhoid block with similar accommodation, and an isolation block for doubtful and other infectious cases. The laundry and boiler-house block contains a washhouse fitted with the usual appliances for washing by machinery, an ironing room with fan ventilating drying closet, and a disinfecting chamber fitted with Thresh's disinfector. There are also a mortuary, stable, and ambulance sheds. A boiler-house is provided, containing two boilers which supply steam for the laundry, hot-water apparatus for heating the wards, hot-water supplies to all the baths and lavatories throughout the buildings, and for working the electrical plant. The ward blocks are all furnished with glass verandahs in the front, having a south aspect for the use of convalescents. The buildings are illuminated by electric light. The buildings at present provide for the treatment of thirty-six patients. Messrs Harold Arnold and Son, of Doncaster, were the contractors, Mr. J. H. Morton, of South Shields, the architect, Messrs. Benham and Sons, Ltd., of London, sub-contractors for the engineering. The clerk of the works was Mr. Fred Simpson, of Doncaster.

WEST RIDING ASYLUM, STORTHES HALL, HUDDERSFIELD.—It is expected that early next month the initial part of what is ultimately to be a great asylum on the Storthes Hall estate will be opened for occupation. The finishing touches and equipment are now being put to a set of buildings to accommodate acute cases of lunacy. These premises have been designed for the West Riding County Council by Mr. J. Vickers-Edwards, the County Architect. The estate is situated about five miles to the south-east of Huddersfield, and comprises an area of 629 acres, of which 261 acres are woods and plantation. Included in the purchase is a roomy and well-built mansion, together with farm buildings, cottages, timber, and minerals, none of the latter having been removed. Good quantities of stone have been found on the estate for foundations and concreting. A fine supply of water is also at hand. The water-works undertaking is now completed and in working order. It consists of a small receiving reservoir, from which water is pumped to an altitude of 800 ft. by motor power to the large circular reservoir, with a capacity of 1¼ million gallons. The first contract in connexion with this Asylum was let to Messrs. John Radcliffe and Sons, builders of Huddersfield, on August 15, 1900, for the sum of 105,900*l.*, and consists of an Acute hospital for 20 cases and two cotage homes for workers, accommodating thirty-five cases each. The next contract was let to Messrs. Nicholson and Son, of Leeds, on November 1, 1901, for the large laundry, boiler-house, engine-room, chimney-shaft, and laundry residence, at a total cost of 44,531*l.* The laundry residence is for those who are working in the laundry, it being desirable that patients who work there should have a distinct and separate residence to themselves. The residence will provide accommodation for fifty cases. These works are also completed. The last contracts were let to Messrs. John Radcliffe and Sons for a residence for the medical superintendent, a reservoir and pumping station, and a lodge for the main entrance (at a total cost of 16,062*l.*), which are practically finished. For the supply of boilers and steam plant the contract was let in May, 1902, to Messrs. Ashwell and Nesbit, of Leicester, at the price of 9,300*l.* The contract for the electric lighting of the institution was let to the Walsall Electrical Company, of Liverpool, in January, 1902, at 5,100*l.* The furniture and fittings for the Acute block, etc., have been supplied by Messrs. Christopher Pratt and Sons, of Bradford, for 7,934*l.* 10s. 8d. The laying-out of the grounds is nearly complete; it has been done under the supervision of the County Architect. In addition, the committee have instructed their architect to push on with the first section of the larger institution, and to provide accommodation for 600 more cases, and the plans are practically completed. When this work has been let further drawings and contracts will be prepared to bring the institution up to the full complement. It is proposed ultimately that this Asylum shall contain accommodation for upwards of 2,000 cases, which, taking into consideration the officers, attendants, nurses, and artisans, will probably mean a total population of 2,500.—*Yorkshire Observer.*

HOMŒOPATHIC HOSPITAL, TUNBRIDGE WELLS.—The annual meeting of the governors and subscribers to the Tunbridge Wells Homœopathic Hospital was held at the institution recently, when the opportunity was taken of opening the new hospital building at Silwood House, Church-road. The work of remodelling the existing rooms and designing the new premises built on to them was entrusted to Mr. C. H. Strange, architect. The hospital now comprises men's and women's wards in the old part of the building, and a large ward and operating theatre in the new part. These rooms, with the ward kitchen, bathroom, charge-nurse's room, and conveniences, are all on the first floor, compactly grouped for convenient administration and oversight. The wards all face south or west, and overlook the grounds and Common. There is also a private ward on the ground floor, where are situated the matron's room, staff dining-room, kitchens, etc. On the second floor are the matron's, nurse's, servants', and caretakers' bedrooms, bathrooms, store-rooms, etc. A patient's lift is placed next to the entrance, and a service lift runs from the basement through all the floors. The building is lighted throughout by electricity, with an auxiliary gas service for emergencies, and heated by low-pressure hot water. There is an iron fire-escape stairs from the top and first floors leading to the grounds, and there are hydrants and other fire appliances disposed in different parts of the building. The outpatients' department is entirely separate, and comprises a large waiting-room, two consulting-rooms, dressing-room, dispensary, etc. The amount expended in building operations has been about 2,250*l.*, and the general contractors were Messrs. Strange and Sons.

BUSINESS PREMISES, DERRY.—Business premises have been erected for Messrs. Roxborough and Co. in Ferryquay-street, Derry. The new building stands on an area of 40 ft. by 56 ft., and it is three stories high. The ground floor is to be used as a provision-shop and warehouse, while the upper floors are intended for offices. The plans for the work were prepared by Mr. R. Eccles Buchanan, and were carried out by Messrs. Joseph Ballintine, Ltd., under the superintendence of Mr. James Simpson.

THEATRE, GLASGOW.—The Glasgow Pavilion Palace of Varieties has just been opened. The new theatre, which is situated at the junction of Renfield and Renfrew streets, has been erected to the designs of Mr. Bertie Crewe, of London. Its main elevation, which is towards Renfield-street, between Sauchiehall-street and Renfrew-street, is in salmon pink terra cotta, treated in the style of the later French Renaissance. The total seating accommodation will accommodate 2,500 persons.

APPOINTMENT.

ARCHITECT TO THE BOARD OF EDUCATION.—The appointment of Mr. Felix Neville Clay as Architect to the Board of Education is announced in the *London Gazette* of March 1. The appointment of Mr. E. R. Robson as Consulting Architect to the Board terminated on September 30, after he had served nearly nineteen years in that capacity. In reply to a question asked in the House of Commons on August 11 of last year upon the matter of Mr. Robson's enforced retirement, the Secretary to the Board stated in the course of his reply—"No question of the competency of Mr. Robson is involved. The Board of Education are making new arrangements to meet new conditions."

MISCELLANEOUS.

THE PYX CHAPEL.—Sir Benjamin Stone has addressed the First Commissioner of Works as to what are the intentions of the Government as to the future uses or disposal of the Pyx Chapel now that it is no longer occupied by a department of the Government, and if it is contemplated making any alterations which will interfere with its venerable and architectural character. Lord Balcarres has replied that the First Commissioner of Works is anxious to give effect to the assurances of his predecessor by giving the public reasonable facilities of admission to the Pyx Chapel. In order to do this it will be necessary to light the Chapel; it is proposed to do so by means of plain standards with electric light, so as to

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avoid any injury to the ancient walls and vaulted roof. The greatest care is being taken not to make any alterations which might interfere with the architecture.

NOTTINGHAM MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Nottingham Master Builders' Association took place recently at the Albert Hotel, Derby-road. Mr. F. H. Fish (President) occupied the chair, and Mr. J. Wright (Hon. Secretary) the vice-chair. Amongst those present were the Mayor (Councillor A. Page), Messrs. E. R. Sutton (Nottingham Architectural Society), E. Fox (Leicester Master Builders' Association), J. Dickinson and R. Weston Frost (Derby Master Builders' Association), A. E. Tallis (Secretary National Federation Midland Centre), T. Munks and H. Rainbow (Nottingham branch Master Painters' Association), G. S. Fish, T. Fish, jun., E. P. Bartlett, A. W. Smith, W. Edgar, William Hall, jun. S. Thumbs, E. Hind, H. Vickers, Jevons, W. Crane, E. Burge, W. C. Hickson, J. J. Spencer, James Wright, Councillor John Wright, W. Maule, F. Cree, R. Simpson, F Quarton, F. Messon, H. Cutts, C. Walker. W. Warburton, G. A. Pillatt, H. Bowers, A. Priestley, L. Priestley, J. Shaw, Andrews, J. H. Vickers, C. P. Shaw, J. Carr, T. Flewitt, J.P., E. A. Pyatt, E. A. Cooper, J. H. Lindley, Shepherd, W. Appleby, S. Ward, T. Long, J. Marchant, Burton, J. Saxby, W. R. Wibberley, F. Harvey, A. Taylor, Pask, Morley, Thorpe, Adkins, and W. J. Barton (Secretary). The loyal toast having been given from the chair and suitably honoured, Mr. Vickers proposed "The Mayor, Magistrates, and Corporation of Nottingham," and said they were pleased to see the Mayor present. The Mayor acknowledged the toast. Mr. W. Edgar proposed "The Architects" and Messrs. E. R. Sutton and W. C. Hickson replied. Mr. E. Fox proposed "Success to the Federation and the Nottingham Master Builders' Association," to which Mr. J. Dickinson and the son and the Chairman replied. Other toasts followed.

PLUMBERS AND PUBLIC HEALTH.—At a recent meeting of plumbers held in Birmingham, Mr. E. Antony Lees, Secretary to the Water Department, in referring to the change in the water-fittings in the City that might be required when the soft water from the Welsh mountains took the place of the hard water now in use, said that as a water engineer he was more interested in the improvement of plumbers as craftsmen than in the financial prosperity of their trade, but he recognised that the two things were bound up together, for they could not have skilled craftsmen in a trade unless that trade brought them an adequate reward. He believed that they were as much concerned as were the City officials in improving the quality of plumbing work, which was so important from a sanitary point of view. He was glad to know that they were interesting themselves in the proper training of youths who were brought into the trade, and were doing what they could to get rid of cheap and nasty plumbing. If they must have cheapness, it should be obtained by skilled work and industry rather than by doing slipshod work and using inferior material. Whatever the result might be, an honourable workman would always leave his work in such a state that no evil result would follow it. The time would come when the public would insist on only such men being employed, and it would be their duty to see that they were adequately paid.

ART INDUSTRIES EXHIBITION, DUBLIN.—The Royal Dublin Society has just issued the list of prizes, amounting to 250*l.*, to be offered at the Art Industries Exhibition in August next. The Exhibition will be held at Ball's Bridge, Dublin, in conjunction with the Irish Horse Show, and will include sections for the following Irish art industries:—Lace, embroidery, tapestry-weaving, wood-carving, artistic leather work, artistic metal work, pyrography and stained-wood work, artistic enamelling, illuminating, stained-glass work, modelling for ornamental plaster work and designs. Hitherto the great obstacle to the development of this useful Exhibition has been the want of space owing to its being held in conjunction with the annual Horse Show, which taxes the resources of the Society to their utmost. The great Irish Horse Show is usually visited by about 60,000 persons, and accordingly it affords a very favourable opportunity for bringing the Irish industries prominently under the notice of the British and American public, and for the sale of the exhibits. The Committee, recognising these great advantages, continued holding the Exhibition in conjunction with the Horse Show, though the space at their disposal was thus extremely limited. The Royal Dublin Society has now decided to erect a special hall at Ball's Bridge for this Exhibition at a cost of about 5,000*l.* The hall is in course of erection, and will be completed in time for the Exhibition in August next. It will have a floor area of upwards of 11,300 sq. ft., and will be fitted with glass show-cases, etc., so that there will be ample space for effectively displaying the exhibits. In almost all departments of the Exhibition there are sections for both amateurs and professionals, and artisans and apprentices are also eligible to compete. All information may be had on application to the Registrar, Royal Dublin Society, Leinster House, Dublin. The Exhibition is essentially an Exhibition of Irish Art Industries, and (as is stated in one of the rules) each competitor must be resident in Ireland.

PEABODY DONATION FUND.—The thirty-ninth report of the Peabody Donation Fund shows that the net gain of the year, from rents and interest, has been 35,090*l.* 11s. 3d., as shown by the accounts, this return being 2·52 per cent. on the capital of the Fund, against 2·40 per cent. last year. The capital expenditure on land and buildings to the end of the year was 1,370,367*l.* 1s. 11d. The repairs, which include extensive drainage alterations at Westminster and Clerkenwell, amount to 13,115*l.* 12s. 2d. At the end of the year the Governors had provided for the artisan and labouring poor of London 11,918 rooms, including those occupied by the superintendents and porters, besides bathrooms, laundries, and lavatories. These rooms comprised 5,387 separate dwellings, viz.:—101 of four rooms, 1,828 of three rooms, 2,572 of two rooms, and 886 of one room. Eighty-two cottages of five rooms each are in course of erection at the Herne Hill Estate, and it is hoped that some of them will shortly be ready for occupation. During the year the Governors have purchased a site of about 4¼ acres situated at Lordship-lane, Tottenham.

CLERKS OF WORKS' DINNER, BRISTOL.—The eleventh annual dinner of the Bristol Clerks of Works and Builders' Foremen's Association was held on Saturday at the Royal Hotel. The Chairman (Mr. A. P. I. Cotterell, F.S.I.) presided, the vice-chairs being occupied by Messrs. H. J. R. Davis and E. Turner.—Mr. T. S. Cotterell, J.P., in response to the toast of "Trade and Commerce," said that the building trade in Bristol at the present time was very prosperous. There was also the great work at Avonmouth now progressing. They all hoped to see the Corporation of Bristol erect suitable municipal buildings as a great centre.—Mr. F. W. Wills, F.R.I.B.A., said his experience concerning the foremen of carpenters was that they strove to do their very utmost. That Association was growing. Those who were in positions and were leaders should do their best to be practical as well as professional. Every man should strive to get to the top of the tree. If every man did that they would turn out a better class of work.—The Chairman, in proposing the toast of "The Association," said he saw by the report that they were a company of between forty and fifty. The Association was very useful, if not for defence purposes, for educational purposes. Each one doing his best ought to be able to do much—better than their fathers did. He had had the pleasure of working with good men, and could see how they had got on.—Mr. H. J. R. Davis, in reply, said the Association was progressing very favourably, and the library now connected with it was found very beneficial.

POMPEII BY NIGHT.—To accede to a request which has often been made by the travelling public, Pompeii is now (according to a communication received at the British Foreign Office from Mr. Consul-General Neville-Rolfe) to be opened on moonlight nights. In order to secure this privilege notice must be given before noon on the day of the visit. There is now an excellent hotel at the entrance to the excavations, so that there is no need to return to Naples the same night. The price of entrance to the ruins at night will be 4 lire per head, as against 2 lire, which is the charge in the daytime, and it is stated that there is no risk of contracting malaria in a night visit.

THE NEW BUILDINGS FOR THE DUKE OF YORK'S ROYAL MILITARY SCHOOL.—Lord Windsor has deposited a short Bill on behalf of the Government which sets forth that land has been purchased in the parish of Guston, Kent, for the purpose of erecting thereon buildings for the Duke of York's Royal Military School. The lands are subject to certain rights of way and cannot be used unless such rights are extinguished. The object of the Bill, therefore, is to extinguish all such rights of way.

DORIS MEMORIAL, DEVONPORT.—A memorial has been erected in Devonport in memory of the men of H.M.S. *Doris* who fell in the late war, and it consists of a base of grey Dartmouth granite upon which a pompom captured from the Boers has been placed. The monument has been executed by Messrs. Harry Hems and Sons, of Exeter, under the direction of Mr. J. F. Burns, the Borough Surveyor.

BRIGHTON MASTER BUILDERS' ASSOCIATION.—On the 1st inst. the eleventh annual dinner of the Brighton Master Builders' Association took place at the Hôtel Metropole, the Chairman (Alderman W. Botting, J.P.) presiding.—After the loyal and patriotic toasts, Mr. G. S. Godfree gave "The Corporations of Brighton and Hove." He noticed that the jubilee of the incorporation of Brighton was to be celebrated this year, and he congratulated the Mayor upon being in office on such an interesting occasion. He was surprised to see on the agenda, a notice of motion in support of a project for bringing the trams down the Marine-parade. He was bitterly opposed to trams on the front, and he had no doubt as to what action the Council would take.—The Mayor, in reply, touched lightly on the principal undertakings of the Corporation, and, alluding to the proposal to run trams along the Marine-parade, said it would be debated, and he really felt that the inherent good sense of the Council would prevent what, to his mind, would be such a disastrous thing as that coming to pass.—The toast of the evening, "The Association of Master Builders," was proposed by Mr. J. K. Nye. He was pleased, he said, that for some time past there had been peace and goodwill between them and their workmen. In connection with the Association, he could not forget that, acting on an excellent suggestion of their Chairman, they formed an Insurance Society. The pitfalls and responsibilities they had under the Workmen's Compensation Act were such that the members should congratulate themselves upon having at their back an excellent insurance fund, which was now represented by several thousand pounds. The membership of the Association was, he understood, well maintained, nearly every local firm being represented in it.—The Chairman, in reply, recalled the circumstances of the strike which led to the formation of the Association twelve years ago, and said that they put their foot down then and had ever since been on the best of terms with their men, who, he believed, appreciated them vastly more than they did before. The decision of the House of Lords in 1901, that trade unions were responsible for the action of their agents, had been of great help to them. Since then the trade unions had been very cautious. With regard to their Insurance Association, they started with very small funds, but their claims did not amount to more than 150*l.* a year, and they had been able to carry forward a very handsome balance every year since its formation in 1898. At this moment they were in possession of very nearly 7,000*l.* to meet any claims that might be made upon them, and in the near future he believed they would be able to reduce the premium 50 per cent.—The remaining toasts were "The Visitors," given by Mr. T. Garrett, and acknowledged by Mr. W. Balchin; "The Chairman," and "The Vice-Chairman."

HORSELL SEWERAGE SCHEME.—A scheme for the sewerage and sewage disposal of Horsell, Surrey, has been prepared by Messrs. Elliott and Brown, of Nottingham. It is proposed to purify the sewage by means of septic tanks and percolating filters, the effluent being finished off by filtration through land. The cost of the works is estimated at 19,676*l.*

WAR MEMORIAL, YORK.—The York Corporation propose to erect a roll of honour, on which the names of all York men who volunteered for active Service during the South African war are to be inscribed, in the Guildhall, and the City Engineer has been requested to prepare a design. It is also proposed by a Committee representing the county to erect in York a memorial to all Yorkshiremen who were killed, and the York Corporation has been applied to for permission to erect it on a site near St. Michael-le-Belfrey Church. The monument will take the form of a Queen Eleanor Cross, and has been designed by Mr. G. F. Bodley, A.R.A.

THE UNITED KINGDOM AND EGYPTIAN TRADE.—In an exhaustive review of the trade and finances of Egypt for the years 1887-1902, Mr. Horace Rumbold, Second Secretary in H.M. Diplomatic Service at Cairo, mentions incidentally that the share of the United Kingdom in the imports of stones, earths, earthenware, glass, etc., which was about one-sixth during the quinquennial period 1887-91, bore much the same proportion in 1902. Most of the cement imported in bags comes from the United Kingdom, whilst Belgium supplies the cement in barrels. The United Kingdom also supplies a certain amount of china and earthenware. Italy sends all the marble and paving-stones, and in view of the great amount of building going on throughout Egypt, her trade under this head is likely to increase. The most striking feature is the amount of the Italian import, which has nearly quadrupled in the last sixteen years. Belgium supplies all the window-panes, and that country, France, and Germany divide the trade in china and earthenware in fairly equal proportions.

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CAPITAL AND LABOUR.

SOUTHPORT MASONS' STRIKE.—The Mayor of Southport (Councillor F. W. Brown) has been requested by the parties in the strike of masons at Holy Trinity Church rebuilding to act as arbitrator. As a result of the agreement, deputations representing the contractor and the men waited upon the Mayor and presented their case. The Mayor intimated that he would carefully consider the evidence submitted before giving his decision, which both parties have agreed to accept as final.

Legal.

CASE UNDER THE 1894 LONDON BUILDING ACT.

COGGIN *v.* DICKESON.

THIS case, which was heard before Mr. Francis at the South-Western Police Court, Lavender-hill, S.W., recently, raised the question whether the alteration of a shop-front to suit a tenant was a work in respect of which a notice should have been given to the District Surveyor under section 145 of the above Act.

Mr. Caudwell appeared for the plaintiff, Mr. Clarence T. Coggin, the District Surveyor, while the defendant, Mr. John Dickeson, appeared in person.

The facts of the case were as follows:—The defendant was the owner of a house and shop, No. 74, St. John's-hill, New Wandsworth, and on reletting the premises to a new tenant, he took out the old and put in a new front to suit such tenant. It was admitted that such alteration was not a work of necessary repair. Mr. Caudwell contended on behalf of the plaintiff that the case was of one in which a notice ought to have been given, and referred to sections 138, 209, 145, 146, (11) (b), and 73 (3) and (4).

The defendant's defence was that no notice was required on the mere alteration of a shop front.

The Magistrate gave judgment for the plaintiff, and stated that it seemed to him the case came clearly within the provisions of the Act relating to building notices, and he ordered the defendant to pay 2s. 6d. fine with 12s. 6d. costs.

THE MARYLEBONE BOROUGH COUNCIL AND ITS ELECTRICAL UNDERTAKING.

MR. JUSTICE BUCKLEY in the Chancery Division on the 25th ult., heard a motion in the action of the Metropolitan Electric Supply Co., Ltd., *v.* the Marylebone Borough Council, by which the defendants asked for an extension of time in which to complete the purchase of that part of the plaintiffs' undertaking which is situate in Marylebone.

Mr. Buckmaster, K.C., and Mr. Clayton appeared for the Borough Council, and Mr. Cripps, K.C., Mr. Astbury, K.C., and Mr. Sergeant for the Company.

Mr. Buckmaster said that the Council obtained statutory powers to purchase the undertaking, and the arbitrator fixed the price at 1,212,000*l.*, but the Council's Bill only gave them power to borrow money with the consent of the London City Council. On August 7, his lordship made a decree for specific performance of the contract by December 31, giving the Borough Council liberty to apply for an extension of time. The London City Council would not sanction the raising the money by loan, and the Borough Council was left with the alternative of levying a rate for the whole amount on the inhabitants which was impossible, or to go to Parliament for power to borrow. On December 11, the Court enlarged the time for completion till February 29. The Council's Bill in Parliament had passed the second reading. Under the order of August 7, the Council was held liable to pay 67,250*l.* for capital expenditure incurred from the date of the arbitration, and as a term of the extension of time the Council was ordered to pay the Company 60,000*l.*, and some other sums, and the Company had to receive interest at the rate of 4½ per cent. on the balance. The Council had handed the Company the 60,000*l.* In order that the Bill might receive the Royal assent before a further application was made, defendants asked for an extension of time for completion till August 31, but plaintiffs wished to impose as a condition that a further sum of 27,500*l.* in respect of capital expenditure should be paid to them. It would be an exceedingly difficult thing for the defendants to raise that money. The learned counsel said that in these circumstances the defendants would prefer taking an extension of time till April 30, and suggested that 10,000*l.* would be a reasonable payment to make.

Mr. Cripps said that the Company would assent to anything that his lordship thought was right.

At the conclusion of the arguments of counsel, Mr. Justice Buckley, in giving judgment, said he was sorry he could not disconnect the ratepayers and the Borough Council. For the former he had great sympathy as they had been saddled with a burden through no fault of theirs. He was desirous of relieving them if it was possible. He had no sympathy with the Borough Council as they had entered into obligations which fell on other persons. Judicially, however, he could only consider the Council. The question was what was a fair figure for the Council to pay as a term of their having a further extension of time to complete. Having regard to the evidence as to expenditure, he found the sum to be 20,000*l.*, but he asked the plaintiffs to accept 15,000*l.*

Mr. Cripps said that the plaintiffs would accept 15,000*l.*

Mr. Justice Buckley said that that being so he would extend the time for completion until April 30 on the term that the defendants would on or before March 31 pay the plaintiffs 15,000*l.* in respect of the expenditure on the undertaking.

Order accordingly.

THE SUBSOIL OF A ROAD AT POPLAR.

THE case of the Metropolitan Borough of Poplar *v.* Millwall Dock Company came before Mr. Justice Farwell in the Chancery Division on the 25th ult., an action by the plaintiffs against the defendants for an injunction restraining defendants from laying a pipe and drain under, and from trespassing upon, East Ferry-road, Poplar.

Mr. W. H. Upjohn, K.C. (with him Mr. Ashton Cross), for the plaintiffs, said his clients' case rested upon a number of Acts of Parliament. The road in question vested in the plaintiffs as property in the ordinary way, and alternatively they said it vested in them as a street. The history of the road commenced in 1812, when an Act was passed which incorporated the Poplar and Greenwich Ferry Company, which had power to purchase land and make roads. At that time there was a road which ran from the Ferry House, south of the Isle of Dogs, to Chapel House, and one of the works which that Company undertook was to straighten this road at an awkward bend. In 1864 the defendant Company was incorporated, and this Company proposed to straighten the road still more, and construct a dock on each side of it. They made a dock on the west side of the road in question, but left on the other side a piece of vacant land. This road now ran near the Millwall Athletic Ground, just below which the defendant Company, under licence granted to the Ferry Company in 1875, constructed a line of pipes. Down to 1903 these were used for the pumping of sludge by the defendants from the west side of the road to the vacant land on the other side of the road. This caused serious complaint from the inhabitants of the neighbourhood, and in the result the Poplar Town Council, under its powers, terminated the licence. Then the defendant Company was called upon to remove the pipes and make good the road, but, as they declined, the plaintiffs moved the pipes. Then the defendants said their intention was to tunnel under the road at a depth of 5 ft. for the purpose of continuing to pump the sludge on to the other side of the road. On December 18 last his lordship granted an interlocutory injunction restraining the defendants from doing this. A part of the original claim was 50*l.*, the costs to the plaintiffs of removing the pipes, but this sum the defendants paid into court. The only question, therefore, was whether what the defendants were doing or threatening to do would be a trespass upon the plaintiffs' property.

Mr. Cripps, K.C., for the defendants, argued that section 43 of the Act of 1864, which conveyed the fee in the land, did not vest the subsoil of the road in the Ferry Company. Originally it was vested in the defendant Company under conveyance, and had in no way been divested from them. The transfer to the Ferry Company was of the surface of the road for the purpose of tolls, etc., but the subsoil the defendant Company could use for the purposes of their works. He asked his lordship to give judgment for the defendants and order an inquiry as to damages.

His lordship, in giving judgment, said that no more was vested in the local authority than was required for the purpose of controlling and protecting and maintaining the streets for the public use. The defendants did not wish to make a tunnel in such a manner as to interfere with the public rights and use of the road as a high road. He accordingly dismissed the action with costs, and granted the defendants an inquiry as to damages on the terms of which the interlocutory injunction was granted.

CASE UNDER THE PUBLIC HEALTH ACT.

THE case of Millard *v.* Balby-with-Hexthorpe Urban District Council came before a Divisional Court of King's Bench composed of the Lord Chief Justice, and Justices Wills and Kennedy on the 29th ult., on an appeal from a decision of the Justices of the West Riding of Yorkshire on a complaint preferred by the Urban District Council for non-payment of paving, etc., charges, under the provisions of the Public Health Act, 1875, in respect of Carr-hill-road, Balby.

The facts of the case were shortly as follows:—The street in question was not a highway repairable by the inhabitants at large, and on June 8, 1899, the Council served on all the owners of premises fronting such parts of the road as required to be paved, etc., requiring them to do the work. The owners not doing the work the Council did it. The work was completed on December 4, 1901, at which date the appellant owned premises in the road which required to be paved, etc. On March 20, 1902, the appellant sold the premises. The Council's Surveyor apportioned 45*l.* as the proportion due from the appellant for the work on his premises, and notice of apportionment was duly served on him on November 24, 1902. On May 20, 1903, a formal demand in writing was served on the appellant for payment of the 45*l.* The appellant contended that he was not liable because he was not the owner of the premises on December 4, 1901, when the work was completed, and also on May 20, 1903, the date of the demand. The respondent's contention was that the appellant was not required by law to be the owner of the premises, both at the date of the completion of the work, and at the date of the demand, but that the apportioned expenses were summarily recoverable from the person who was the owner of the premises when the works were completed. The Justices took this view, and held the appellant liable to pay the 45*l.*

At the conclusion of the arguments of counsel, the Lord Chief Justice, in giving judgment, said he felt bound by the decision in the case of the Queen *v.* Swindon in which it was held that an owner to be liable must be the owner at the time of the demand. His lordship said that if that decision was to be varied, it must be by the Court of Appeal.

Justice Wills and Kennedy concurred, and the appeal was accordingly allowed.

Leave to appeal was given.

PAVING CHARGES.

AT Southwark Police Court on Tuesday, Mr. Cecil Chapman gave his decision in the summons taken out by the Southwark Borough Council against Emily Caroline Furber, of 65, Carlton-hill, N.W., for the payment of 24*l.* 16s. 1d., apportionment charges in respect to paving, etc., in front of some model dwellings in Bear-garden, Bankside, of which she was the owner. He said he had come to the conclusion that the Borough Council were entitled to treat Bear-garden as a new street, and that the defendant was liable to pay the apportionment upon her property. The question of liability depended upon whether the place was a highway before 1835. He would not recapitulate its history except for the purpose of dealing with the evidence relied upon for the defence. It was admitted that after the abolition of the bear-pit in the XVIIth or early XVIIIth century buildings were erected on either side of the spot which had become a pleasure resort of some kind, and the paths and road were paved with granite sets. Apparently, the thoroughfare was first opened to the public and foot-passengers, and the road for carriages was reserved as private until well in the XIXth century. Resolutions were passed by the local authorities in 1848 and 1879 not to take over this place, but it was pointed out for the defence that this was not conclusive, because if they were liable to repair it before 1835, no amount of resolutions afterwards would get rid of their liability. One of the facts relied upon to establish their pre-existing liability was the existence of iron posts in the foot pavement on either side of the roadway from a date as early as 1815, and another fact was the payment of sums upon Bear-garden by the St. Saviour's Board of Works from 1883 to 1887 under the general heading of "expenditure upon streets." The iron posts were evidence that the footways were public property, but not the roadway, and the sums expended in repair were trifling and did not involve any admission of liability. —Judgment was given for the Borough Council with 10*l.* 10s. costs.

BUILDING OWNER AND HERNE BAY URBAN DISTRICT COUNCIL:

DRAINAGE DISPUTE AT HERNE BAY.

MR. JUSTICE GRANTHAM in the King's Bench Division on the 25th ult. heard the case of

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Ramuz and Rowe *v.* the Herne Bay Urban District Council, an action for a declaration that the plaintiff Ramuz was entitled to connect the drains of his houses on the Western Esplanade, Central, St. George's, and other estates with the sewers belonging to the defendants. The plaintiff Ramuz also claimed damages against defendants by reason of the defendants trespassing and wrongful entering on the plaintiffs' roads, land, and premises known as the St. George's Hotel, and disconnecting the drains with the sewers, and for obstructing the drainage. Mr. Ramuz also asked for an order on the defendants to remove such obstructions and to connect the drains, and an injunction to restrain the defendants from further acts of trespass. He also claimed damages against the defendants for alleged breach of an agreement dated May, 1901, and two conveyances, and the plaintiff Rowe also claimed relief.

Defendants, by their defence, generally traversed the plaintiffs' allegations, and denied that the roads were laid out and constructed in accordance with plans deposited with defendants' predecessors.

In a second action the Council claimed a declaration that Ramuz should pull down the old Coastguard Station and deliver them up vacant possession of the land, and they contended that under the terms of an agreement he could not drain his houses until this was done.

Defendant, whilst admitting the agreement, said that the Council had not carried out their part of it.

Mr. H. F. Dickens, K.C., and Mr. Herbert Smith appeared for the plaintiff Ramuz, and Mr. Macmorran, K.C., and Mr. Hohler for the Council.

Mr. Dickens opened the case and the facts, during the course of which he stated that Ramuz was now in a position to give the Council the land upon which the Coastguard Station stood.

His lordship suggested that the parties should endeavour to come to terms.

After a long consultation, Mr. Dickens asked his lordship to adjourn the case, with liberty to either party to apply. They hoped to arrive at satisfactory terms eventually.

His lordship assented to this course being adopted.

ARCHITECT'S SUIT AGAINST NEWCASTLE BUILDERS.

AN action for damages for slander was heard at the Newcastle Assizes on the 23rd ult. Plaintiff was Mr. Edward Shewbrooks, an architect, and defendants were Messrs. S. F. Davidson and S. Millar, contractors. Mr. Shewbrooks claimed damages for slanders spoken of him by the two defendants, while the defendants denied that they uttered the words complained of, or that the words complained of bore the defamatory meaning alleged.

Counsel said that Mr. Shewbrooks was a very well-known architect in Newcastle, and it appeared that in 1902 Mr. Sinclair, tobacco-manufacturer, determined to do a considerable amount of work on his premises, and he arranged with Mr. Shewbrooks that he should act as his architect in the carrying-out of his building operations. Mr. Shewbrooks in consequence prepared the specifications and plans, and so on, and bills of quantities, and sent out to a certain number of well-known contractors to tender for this work. Mr. Davidson, one of the defendants, was a well-known contractor in this district, and Mr. Millar was a gentleman apparently carrying on the same business who had become associated with Mr. Davidson in the execution of these works for Mr. Sinclair. As the contract proceeded, Mr. Shewbrooks had to condemn certain bricks used, and, acting in the interests of his employer and in the execution of his own duty, he was bound to condemn the bricks and to insist that the bricks which Mr. Sinclair was paying for should be provided. It was alleged that Mr. Davidson called Mr. Shewbrooks, in the presence of Mr. Sinclair, "one of the five scamps of Newcastle who took secret commissions. If it had been twenty years ago he would have been in gaol."

Mr. Shewbrooks was called and said he had been in business in Newcastle for thirty years.

For the defence the allegations were denied, the only suggestion being that the defendants were unable to work with Mr. Shewbrooks.

Eventually the jury found a verdict for the plaintiff, but thought the case ought never to have been brought into court. They assessed the damages at one farthing.

Judgment was entered for one farthing and costs.—*Newcastle Mail.*

APPOINTMENT OF SANITARY OFFICER.—The Local Government Board has sanctioned the appointment of Mr. H. O. Harris as a sanitary inspector in Bermondsey, in place of Mr. T. L. Davies, resigned.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

18,964 of 1902.—J. PECKOVER: *Reciprocating Machines for Sawing and Working Stone and the like.*

A reciprocating stone-sawing machine, consisting of means for separating the silt from the abrading material ejected from the saws, moulding and finishing devices, and comprising mainly of sheets attached to the carrier frame so as to cause the material to fall on to other inclined planes disposed beneath the stone, and then dropped into a gutter provided with a conveyor, or scraper.

2,442 of 1903.— A. GREAVES and J. W. ARCHBOLD: *Apparatus for the Cure of Smoking Chimneys and for Regulating the Upcast Draught.*

An apparatus for the cure of smoking chimneys, consisting in the application in the flue of trays so disposed relatively to each other and to the aperture of the flue as to regulate the upcast draught to increase and decrease it, and to prevent down-draught causing smoke in the room.

2,682 of 1903.—F. L. BROUGHTON: *Fencing.*

In iron or steel fencings, the fastening of the members or component parts together by clip pieces pressed out or formed from one set of members, but not separated therefrom, and adapted to be closed tightly upon the other set.

3,028 of 1903.—J. PARKER: *Machinery for Moulding Bricks and the like.*

According to this invention, a machine is constructed, composed of a suitable framework, provided with bearings to receive a driving-shaft, upon which a series of double-acting cams are keyed. These cams are so fixed upon the driving-shaft that they shall not operate simultaneously. The cams are provided with flanges and springs for the purpose of drawing back plungers within their respective moulding-boxes. The said cams are struck to a concentric radius at their greatest diameter for the purpose of retaining the plungers at the maximum pressure during the desired space of time. The said framework is provided with suitable guides for the purpose of carrying moulding-plungers, preferably two plungers and two moulding-boxes to each cam; the said plungers are simultaneously forced outwards from the driving-shaft by the action of the cam during the process of moulding, after which they are partially withdrawn from the moulding-boxes by the same, or separate cams. The plunger guides terminate in a moulding-box for each plunger. Each moulding-box is provided with a guillotine cut-off device, working in suitable guides attached to, or integral with, the framework of the machine. Each of the said guillotines are operated by a pivotted bell crank, or lever, connected thereto by a link. The bell cranks, or levers, are operated by cams. The framework is provided with openings, suitably situated with regard to the guillotines, for the admission of the material to be moulded.

4,081 of 1903.—H. A. L. BARRY: *Means for the Automatic Regulation of Stove Fires.*

Means for automatically regulating the draught through a stove, comprising a rod secured at one end to the metal flue pipe and connected at the opposite end to the short arm of a bell crank lever, or its equivalent, pivotted on the said pipe; the long arm of the said lever being connected with a lever secured upon the spindle of a damper arranged in the flue, whereby the said damper may be rocked upon its axis, and the effective area of the flue varied.

4,154 of 1903.—J. H. J. BARTELS: *Cement for Uniting Pieces of Wood.*

A cement for uniting pieces of wood, consisting of animal glue dissolved in weak lime water, fine linseed meal, and silicate of soda.

5,023 of 1903.—W. H. HOLLAND and R. THOMASON: *Rising Hinges.*

A rising hinge, comprising a door and door post hinge plates, consisting of a central barrel portion on the door post plate and outer barrel portions on the door plate, the meeting edges of such barrels being inclined, or spiral, relatively to the hinge pin, one or more anti-friction rollers disposed between such edges, a hinge pin threading such barrels, and fast to the central barrel, and ball bearings disposed between such door plate barrels and the hinge pin.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

5,841 of 1903.—T. BAMFORTH and P. ALLEN: *Cooking Ranges.*

According to this invention, a range is formed with the usual back plate through which the hood works, or slides, over the hob, the said hood being fitted with a loose pivotted door, which is opened and closed on drawing forward and pushing back the hood by means of curved guides on the latter. Connecting the parts of the hob under the hood is a fixed back strap, the forward edge of which is so cut away as to permit of easy access to the boiler on removal of the hood, and a loose, portable plate, which is fitted under the hood at the hob level. The usual fire cover is fitted to slide, when opening the fire, under the said loose plate, which it raises bodily with the hood upon it. Upon drawing forward the fire cover, it, as well as the hood and portable back plate may be withdrawn from the hob, and access may then be had to the boiler manhole without taking apart any fixed part of the range.

6,598 of 1903.—R. S. HEAP: *Hoists or Elevators.*

According to this invention, the door, or gate, is divided horizontally into two parts, which are connected together by ropes, or chains, passing over pulleys in such a manner as to counterbalance each other, and so that one ascends whilst the other is descending, and thereby a 6 ft. opening is obtained by a movement of only 3 ft. of each half of the door, or gate. To the upright guides in the well, or to any other convenient part, a metallic box is fixed, in each side of which is formed a slot, which is not quite vertical, but slightly sloping in a diagonal direction, and in these slots the axes of two grooved, sliding pulleys are mounted, and in the box three other pulleys are fixed, and the ropes from the two halves of the sliding doors are passed over and under these pulleys in such a way that the movement of one of the sliding pulleys in the slots, say, about half the height of one half, the door, or gate, shall open the same fully, by raising one and depressing the other. The movement of the sliding pulleys in the inclined slots so as to open or close the doors, or gates, is effected by two catches which are attached to the side of the "cage," one on each side of the slot, and so arranged that one will act as the cage is ascending, and the other acts as it descends, both being so mounted as to be able to give way when not required to act.

6,703 of 1903.—E. G. JACKSON: *Preparation of "Carton Pierre."*

The preparation of "Carton pierre" in a liquid condition, enabling it to be washed into moulds of the articles to be reproduced, and to readily set therein without shrinkage, by homogeneously mixing pulped paper about one part, of glue about two parts, of water about 20 parts, of whiting about 10 parts, of Plaster of Paris (boiled) about 10 parts, and by adding to such mixture about one-twentieth part of sulphuric acid immediately prior to the liquid material being washed into, or applied to, the mould.

7,339 of 1903.—E. JONES and W. DAVIES: *Appliance for Bursting or Breaking Down Rock and the like.*

An appliance for bursting or breaking down rock and the like, consisting in the combination in, and with, a cylinder having a certain portion of its surface cut away, and containing one or more recesses, of a cam fitting each of such recesses, a piece of leather, or the like, beneath each cam, a common passage for the appliance, and a branch passage leading from the passage into the bottom of each recess.

7,566 of 1903.—J. DOBSON: *Fireproof Building Blocks, or Slabs.*

The object of this invention is to construct building blocks, or slabs, in such a manner as to have great strength of resistance and to be practically sound and fireproof, and which, at the same time, to take up little space. The slabs are constructed preferably of a mixture of breeze, cement, and slag, and are of any suitable size, preferably about 2 in. in thickness. A V-groove is formed all around the edges of the blocks, or slabs, which are dowelled vertically and horizontally with iron, steel, copper, or other metal dowels. The whole of the blocks, or slabs, are, therefore, bound together with the said dowels, so making a strong fireproof wall or partition.

7,579 of 1903.—GILMOUR, MORTON, and Co., LTD., J. MORTON, M.P., and A. MILLOUY: *Manufacture of Glazed Bricks and the like.*

The manufacture of glazed bricks, consisting in forming the bricks with frog recesses extending to the ends of the bricks, or with recesses extending centrally across their edges, and in arranging the bricks in a bonded pile in the glazing furnace, with the recesses of

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alternate layers of the pile situated above the top edge glazing of the intermediate layer.

7,859 of 1903.—E. G. HARCOURT: *Bolts for Doors and the like.*

Bolts, for doors and like purposes, operated by a rotary, or spiral, or helical movement of the projecting knob or finger piece.

8,171 of 1903.—J. E. HAZLEHURST: *Means for Stretching Barbed and other Wire employed in Fencings, Ropes, Cords, Chains, and the like and apparatus therefor.*

This consists in the construction and combination of parts composing the means for stretching barbed and other wire employed in fencings, ropes. cords, chains, and the like and apparatus therefor, consisting of a metallic slotted frame, provided with a clip and a catch, or hook, for securing the same to a post; a metallic slotted frame being provided with a swivelling nut threaded internally to receive a screwed spindle carrying a socket and sliding handle; the upper side of the open "head" of the metallic slotted frame having a projection with a slot to receive the barbed and other wire, rope, cord, chain, and the like when the latter is operated upon by the eccentric grip, the other end of the screwed spindle being provided with the slotted socket and with the arms, between which is located the eccentric grip to operate upon the barbed, or other wire, rope, cord, chain, and the like.

8,474 of 1903.—D. F. COOKSEY: *Border Ridging and the like Tiles.*

A tile, for garden edging, roof ridging, and the like purposes, characterised by having a dowel pin projecting so as to engage in the socket of the next adjoining tile, for the purpose of keeping the tiles in line with each other.

8,809 of 1903.—C. E. CHALLIS: *Construction of Mats, Gratings, Floor Coverings, and the like.*

The construction of mats, gratings, floor coverings, and the like, consisting of the combination of rods, strips, laths, or blocks of wood of suitable shape connected by links, plates, or wires.

11,455 of 1903.—G. F. NEWMAN and H. A. LOUKS: *Regulators or Mechanism for Operating Fanlight Openers and Ventilators.*

Regulators, or mechanism, for operating fanlight openers, ventilators, and analogous purposes, consisting in the employment, or application of adjustable anti-friction and thrust bearings interposed between the ends of rotatory elements of the mechanism and thrust rings, which are secured to, or carried, by the casing, or stationary part, of the appliance.

11,952 of 1903.—C. HARVEY and H. G. SHORTHOUSE: *Production of Sheet Metal Cased Hinges.*

Sheet metal cased hinges, in which both sides of the casing metal are disposed, or included, within the inside of the knuckles of the foundation, or body part, and are nipped and secured by the closing of the said knuckles.

19,843 of 1903.—A. A. ROSE: *Roofing Tiles.*

A hexagonal-shaped roofing tile, having a longitudinally channelled central part, with the various interlocking flanges and catch blocks.

27,626 of 1903.—H. HIRSCHBACH: *Manufacture of Porous Bricks, or Blocks.*

The manufacture of bricks from volcanic sand by binding the said sand with blast furnace slag powder, or meal, and a suitable quantity of water.

28,561 of 1903.—R. W. BOYD: *Open Fire Ventilating Grate.*

A ventilating fire grate, comprising a ribbed outer case, with loose iron linings, and a draught regulator.

28,678 of 1903.—R. W. H. RODNEY: *Locks and Latches, in which a Lifting Latch is Used.*

Combined locks and lifting latches, consisting essentially in the combination of parts forming the mechanism for operating the latch, and so that it may be reversible.

203 of 1904.—W. HUMBLE, T. S. HUMBLE, W. H. HUMBLE, and G. B. HUMBLE: *A Floor Cramp.*

A floor cramp having a sliding rack bar, a pair of operating pawls mounted in a rocker, and means of clamping said cramp to the joist.

6,999 of 1903.—A. E. HUBERT and W. EDWARDS, (trading as Banner Sanitation Company): *A Flushing Tank for Drains, Sewers, and the like.*

Flushing tanks for drains, consisting of a syphon pipe and dome, a trap situated below same, an air valve in top of said dome, which is suddenly raised when the water has risen to a predetermined level, and which readjusts itself when the tank is empty.

28,405 of 1903.—J. T. CROSSLEY: *Machines for Preparing Ground for the Laying of Paving Blocks and Tiles.*

A machine, consisting, in combination, of a body, a scoop carried thereby, a conveyor belt adapted to advance the material excavated by said scoop, a second conveyor belt, constituting an elevator, and adapted to receive the material advanced by said first conveyor belt. rear driving wheels, means for driving said conveyor belts from said wheels, a fork pivotally carried forwardly of said body, a guide wheel carried by said fork, a lever adapted to maintain said fork in a plurality of positions, a wheel post, means for adjustably attaching the same to said body, and a wheel carried by said wheel post, and adapted to run upon a cable.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 22.—By JOHN BOTT & SONS.

Dulwich.—285, Croxted-rd., u.t. 93½ yrs., g.r. 8*l.* 10s., e.r. 52*l.* 10s. £530

By DAVID J. CHATTELL.

St. Mary Cray, Kent.—High-st., "Cranbrook House" and "Kent House," y.r. 57*l.* 4s., also a plot of land, total area ¼ of an acre, f. 650

By A. M. NEWCOMBE.

Beckenham.—17, Clock House-rd., u.t. 85 yrs., g.r. 5*l.* 10s., e.r. 36*l.* 350

27 and 29, Clock House-rd., u.t. 85¼ yrs., g.r. 14*l.*, e.r. 68*l.* 620

February 23.—By FRASER & HEIGH.

Wandsworth.—36, 38, 40, and 42, High-st. (s.), area about 9,300 ft., f., y.r. 137*l.* 16s. 9d. 2,925

Forest Gate.—41 to 53 (odd), Dames-rd., f., y.r. 206*l.* 2 310

By NEVILLE & CROSSE.

Putney.—8 and 10, Carmalt-gdns., u.t. 80½ yrs., g.r. 22*l.* 10s., e.r. 102*l.* 800

By REYNOLDS & EASON.

Islington.—11, Prebend-st., and 94, Windsor-st. (s.), c., y.r. 54*l.* 4s. 540

Canonbury.—8, Douglas-rd., u.t. 42 yrs., g.r. nil, e.r. 65*l.* 590

By RUTLEY, SON, & VINE.

Barnsbury.—167, Hemingford-rd., with stabling, u.t. 38½ yrs., g.r. 12*l.*, p. 500

Camden Town.—95, Arlington-rd., u.t. 33 yrs., g.r. 4*l.*, y.r. 42*l.* 400

By FREDERICK WARMAN.

Islington.—Rear of 147 to 152, Upper-st., freehold building land, area 7,000 ft., p. 500

Holloway.—3, Turle-rd., u.t. 47 yrs., g.r. 13*l.* 18s. 4d., e.r. 60*l.* 450

Hoxton.—159 to 165 (odd), St. John's-rd. (s.), u.t. 28 yrs., g.r. 71*l.* 10s., y.r. 180*l.* 400

Crouch End.—20, Barrington-rd., u.t. 70 yrs., g.r. 8*l.*, e.r. 45*l.* 395

By G. F. NORFOLK & CO.

Blackheath.—8, 8a, 9, and 9a, Kelvin-ter., u.t. 97 yrs., g.r. 13*l.*, w.r. 93*l.* 12s. 760

Glenluce-rd., f.g. rents 22*l.* 1s., reversion in 95 yrs. 545

Greenwich.—72, Woolwich-rd. (s.), u.t. 90 yrs., g.r. 7*l.* 14s. 6d., y.r. 60*l.* 650

By NICHOLSON GREAVES, & CO. (at Sheffield.)

Sheffield, Yorks. — Cambridge-st., a corner building site, area 346 yds., f. 1,450

Trippet-la., a freehold building plot, area 200 yds. 390

By ALFRED RICHARDS (at Tottenham).

Tottenham.—103 and 105, Winchelsea-rd., f., w.r. 67*l.* 12s. 705

26, Steele-rd., f., w.r. 33*l.* 16s. 335

Chesnut-rd., "The Stoneleigh Works," f., p. 1,700

36, Springfield-rd., u.t. 76½ yrs., g.r. 4*l.*, p. 255

70, Stamford-rd., u.t. 61 yrs., g.r. 4*l.* 10s., w.r. 28*l.* 12s. 145

Edmonton.—68 to 74 (even), Balham-rd., u.t. 94½ yrs., g.r. 18*l.*, w.r. 93*l.* 12s. 320

27 to 37 (odd), Millfield-rd., u.t. 71½ yrs., g.r. 18*l.*, e.r. 117*l.* 380

February 24.—By BAXTER, PAYNE, & LEPPER.

Bromley, Kent.—Blyth-rd., "Sherstone," f., p. 1,510

Brondesbury.—2, Christ Church-av., u.t. 69 yrs., g.r. 18*l.*, y.r. 85*l.* 790

Bethnal Green.—278. Bethnal Green-rd. (s.), f., y.r. 45*l.* 915

By DYER, SON, & HILTON.

Blackheath. — 8, Vanbrugh Park-rd., u.t. 53 yrs., g.r. 12*l.*, p. 600

Lewisham.—9, Carlton-rd., u.t. 69 yrs., g.r. 8*l.*, p. 550

By MORLEYS'.

Edgware-rd.—No. 127, also 1, Burwood-pl., beneficial lease for 16½ yrs., y.r. 150*l.* 275

By NOTT, CARTWRIGHT, & ETCHES.

Pimlico.—6, Vauxhall Bridge-rd., u.t. 23½ yrs., g.r. 13*l.*, y.r. 55*l.* 410

Balham.—45, Culverden-rd., u.t. 72 yrs., g.r. 10*l.*, e.r. 60*l.* 450

26, Cornford-gr., u.t. 70½ yrs., g.r. 8*l.*, e.r. 42*l.* 360

By R. TIDEY & SON.

De Beauvoir Town.—108, De Beauvoir-rd., u.t. 16½ yrs., g.r. 5*l.*, y.r. 36*l.* 245

27, Southgate-rd., u.t. 14½ yrs., g.r. 2*l.*, e.r. 34*l.* 225

64, Southgate-rd., u.t. 68½ yrs., g.r. 13*l.*, y.r. 42*l.* 420

By FRANK WINTERTON.

Harringay.—10, Woollaston-rd., u.t. 83 yrs., g.r. 7*l.*, e.r. 42*l.* 400

By DOUGLAS YOUNG & CO.

Tottenham Court-rd. — No. 16 (shop and factory), f., y.r. 225*l.* 4,300

Hastings, Sussex. — 36, Wellington-sq., f., y.r. 55*l.* 875

By BLAKE & CARPENTER.

Shirley, Surrey.—Spring Park-rd., a block of freehold building land £270

Shirley Church-rd., four plots of freehold building land 1,350

Wickham-rd., "Shirley Rose Nurseries," f., y.r. 36*l.* 875

Wickham-rd., "The Crown Inn," f., y.r. 70*l.* 2.950

Wickham-rd, freehold cottage and garden, q.r. 15*l.* 260

Wickham-rd., a piece of garden ground, f. 170

Shirley-rd., four freehold building plots 1,560

By BALLARD & MARSH (at Twickenham).

Teddington.—Waldegrave-rd., three plots of land, f. 245

Twickenham.—Strawberry Hill-rd., "Bromley Villa" and "Lancaster Villa," c., y.r. 60*l.* 710

By J. M. LEEDER & SON (at Neath).

Neath, Glamorgan.—73 to 76, Montpelier-ter., f., y.r. 58*l.* 16s. 1,255

37 and 38, Briton Ferry-rd., f., y.r. 29*l.* 14s. 3d. 650

36, Briton Ferry-rd. ("Hong Kong Stores"), u.t. 48½ yrs., g.r. 3*l.* 15s., y.r. 40*l.* 625

7 and 8, Lombard-st., f., y.r. 19*l.* 4s. 440

Lombard-st., freehold stable and warehouse, also clay pit and plot of land, f., y.r. 18*l.* 250

By BELLAMY & Co. (at Putney).

Putney.—78, West-hill, u.t. 84 yrs., g.r. 5*l.*, e.r. 65*l.* 640

Fulham.—62, Felden-st., u.t. 90 yrs., g.r. 7*l.*, y.r. 52*l.* 16s. 455

February 25.—By FAREBROTHER, ELLIS, & CO.

Wandsworth.—2, High-st., and 1, 3, 5, and 7, North-st. (including smithy and stabling), area 15,200 ft., f., y.r. 178*l.* 8s. 4,500

West Kensington.—36 to 42 (even), Vereker-rd., u.t. 78½ yrs., g.r. 50*l.*, y.r. 255*l.* 2.000

39, Edith-rd., u.t. 71½ yrs., g.r. 1*l.*, p. 1,000

56, Edith-rd., u.t. 71½ yrs., g.r. 12*l.*, y.r. 65*l.* 500

106 and 108, Baron's Court-rd., u.t. 78½ yrs., g.r. 20*l.*, y.r. 90*l.* 805

26, Talgarth-rd., u.t. 72½ yrs., g.r. 10*l.*, y.r. 55*l.* 420

By HUMPHREYS, SKITT, & HUMPHREYS.

Peckham.—Hollydale-rd., f.g.r. 81*l.*, reversion in 69 yrs. 2,120

Queen's-rd., f.g.r. 21*l.*, reversion in 5½ yrs. 820

By C. C. & T. MOORE.

Mile-end.—53, Nicholas-st., f., w.r. 28*l.* 12s... 355

Bow.—42, Alfred-st., u.t. 43 yrs., g.r. 4*l.* 4s., q.r. 36*l.* 400

Hackney.—143, Victoria Park-rd., area one-third of an acre, u.t. 36 yrs., g.r. 12*l.*, p. 1,000

By NEWBON, EDWARDS, & SHEPHARD.

Holloway.—60, Kingsdown-rd., u.t. 54 yrs., g.r. 5*l.* 5s., w.r. 39*l.* 275

Hornsey.—220, Wightman-rd., f., y.r. 34*l.* .. 500

Stamford Hill.—Nos. 70, 72, 74, and 76 (s.), u.t. 84 yrs., g.r. 80*l.*, y.r. 360*l.* 5,050

3, 5, and 7, Bergholt-rd., u.t. 81 yrs., g.r. 22*l.* 10s., y.r. 135*l.* 1,320

37 to 59 (odd), 63 and 65, Cranwich-rd., u.t. 86 yrs., g.r. 98*l.*, y.r. 616*l.* (in lots) 5,655

8 and 18, Cranwich-rd., u.t. 81 yrs., g.r. 15*l.*, y.r. 71*l.* 775

By J. C. PLATT.

Shepherd's Bush.—Blomfield Pavement, etc. (The Blomfield Estate), f.g.r. 398*l.*, including several peppercorn ground rents, reversions in 26, 61, 71, and 81 yrs. (in one lot) 11,400

By STIMSON & SONS.

Chiswick.—445, High-rd. (s.), u.t. 46 yrs., g.r. 10*l.*, y.r. 55*l.* 470

Bermondsey.—14, Willow-walk, u.t. 18½ yrs., g.r. 4*l.* 13s., w.r. 36*l.* 8s. 160

Peckham.—14, Blake's-rd., u.t. 53½ yrs., g.r. 5*l.*, w.r. 31*l.* 4s. 170

1, Hornby-rd., u.t. 53½ yrs., g.r. 5*l.*, w.r. 28*l.* 12s. 150

31, Grenard-rd., u.t. 60½ yrs., g.r. 5*l.* 10s., w.r. 32*l.* 10s. 265

Old Kent-rd.—21 and 23, Arthur-st., u.t. 15½ yrs., g.r. 3*l.* 10s., w.r. 57*l.* 4s. 200

Peckham. — 60 and 62, Lyndhurst-rd., f., y.r. 90*l.* 1,070

45 and 47, Denman-rd., f., y.r. 68*l.* 1,090

Camberwell.—17, Boyson-rd., u.t. 46 yrs., g.r. 6*l.* 6s., p. 350

By JOSEPH STOWER.

King's Cross. — 53, Liverpool-st. (part of "Hott's Hotel"), f., y.r. 90*l.* 1,600

34 and 35, Liverpool-st., f., e.r. 100*l.* 1,720

Regent's Park.—73, Regent's Park-rd. (s.), f., y.r. 36*l.* 700

Peckham.—57 and 59, Elm-gr., and 66 to 72 (even), Victoria-rd., u.t. 78 yrs., g.r. 14*l.* for next 22½ yrs., and 40*l.* thereafter 1,360

By VARLEY & LOCKING.

Finsbury Park.—13, Woodberry Down, u.t. 81½ yrs., g.r. 2*l.*, e.r. 120*l.* 1,700

February 26.—By BROWETT & TAYLOR.

Whitechapel.—21, Great Prescott-st., and 19, Chambers-st., area nearly 2,000 ft., f., e.r. 120*l.* 2,190

Kentish Town.—91, Harmood-st., c., w.r. 46*l.* 16s. 420

By C. GERRETT & Co.

Norwood.—95, Birchanger-rd., f., p. 465

Martha-ter., f.g.r. 5*l.*, reversion in 96 yrs. 130

By W. MARTIN & Co.

Dulwich.—3, Hillsboro'-rd., u.t. 60 yrs., g.r. 7*l.* 10s., y.r. 44*l.* 510

Peckham.—12, 14, 16, and 18, Copeland-rd., u.t. 53 yrs., g.r. 20*l.*, w.r. 143*l.* 810

Contractions used in *these lists.*—F.g.r. for freehold ground-rent; l.g.r or leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court

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MEETINGS.

FRIDAY, MARCH 4.

Architectural Association.—(1) Special Meeting to consider whether the day of the Ordinary Meetings shall be changed. (2) Mr. J. W. Simpson on "Schools." 7 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "Calculations, Measurements, and Plans and Sections." 7 p.m.

Junior Institution of Engineers (Westminster Palace Hotel).—Paper by Mr. G. C. Allingham entitled "Some Practical Notes on Electric Storage Batteries." 8 p.m.

SATURDAY, MARCH 5.

Architectural Association.—Fourth Spring Visit, to the Savoy Hotel, by permission of Messrs. T. E. Collcutt and Stanley H. Hamp. 2.30 p.m.

Royal Institution.—Right Hon. Lord Rayleigh on "The Life of Stokes," III. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage Works, Sutton, Surrey. 3 p.m.

Institute of Sanitary Engineers, Limited.—Visit to the Richmond Main Sewage Works (Mr. W. Fairley, engineer).

British Institute of Certified Carpenters.—Discussion on "Failures in Carpentry and Joinery." 6 p.m.

MONDAY, MARCH 7.

Royal Academy.—Professor Aitchison, R.A., on "Vitruvius," III.

Surveyors' Institution.—Mr. T. Binnie on "The Land Purchases for the New Naval Base at Rosyth, on the Firth of Forth." 8 p.m.

Society of Engineers.—Mr. F. Latham on "Some Recent Works of Water Supply at Penzance." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor R. Elsey Smith on "Building Materials." 7 p.m.

Society of Arts (Cantor Lectures).—Mr. Bertram Blount, F.I.C., on "Recent Advances in Electro-Chemistry," I. 8 p.m.

Regent-street Polytechnic (University Extension Lectures).—Professor Vivian Lewes on "The Chemistry of Air, Fire, and Water," VI. 8 p.m.

Glasgow Philosophical Society (Architectural Section).—Mr. A. Gardner on "Old Glasgow Buildings—Historical and Descriptive," illustrated. 8 p.m.

Liverpool Architectural Society (Incorporated).—(1) Presentation of a Testimonial to Professor Simpson. (2) Mr. G. Gilbert Scott will exhibit and explain about Twenty Drawings of the Liverpool Cathedral. 6 p.m.

TUESDAY, MARCH 8.

Institution of Civil Engineers.—Mr. R. Scott Scholefield on "The Erection of Iron Bridges." 8 p.m.

Institute of Builders.—Conditions of Contract Sub-Contractors' Committee Meeting. 4 p.m. Conditions of Contract Committee Meeting. 4.30 p.m.

WEDNESDAY, MARCH 9.

National Photographic Record Association.—Annual meeting at the Midland Grand Hotel, St. Pancras. Chair will be taken by Sir J. Benjamin Stone, M.P., at 4.30. Report will be presented, and some of Sir J. Benjamin Stone's more recent photographs will be exhibited.

Edinburgh Architectural Association.—Rev. D. Butler, M.A., on "The Religious Inspiration of Historical Architecture." 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(1) Inspection in the District of Hackney. (2) Mr. J. Wright Clarke on "Details of Plumbers' Work." 7 p.m.

THURSDAY, MARCH 10.

Royal Academy.—Professor Aitchison, R.A., on "Vitruvius," IV.

Architects' Benevolent Society.—Annual General Meeting. No. 9, Conduit-street, W. The President, Mr. Aston Webb, will take the chair at 5 p.m.

Royal Institution.—Professor H. L. Callendar on "Electrical Methods of Measuring Temperature," III. 5 p.m.

Carpenters' Hall, London-wall (Free Lectures on Matters connected with Building).—Professor F. M. Simpson on "Architectural Development during the XIXth Century." 8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. C. E. Bateman and Mr. J. Ward on "Sketching Excursions of the Birmingham Architectural Association." 6.30 p.m.

Institution of Electrical Engineers.—(1) Mr. F. F. Bennett on "The Railway Electrification Problem and its Probable Cost for England and Wales." (2) Mr. H. M. Hobart on "The Rated Speed of Electric Motors as Affecting the Type to be Employed." 8 p.m.

Manchester Society of Architects.—The Students' Drawings for the whole Session will be on Exhibition from 6 p.m. At 6.45 p.m. the Prizes to the successful Competitors will be Presented by the President. This will be followed by a General Review and Discussion of the Drawings.

FRIDAY, MARCH 11.

Institution of Civil Engineers (Students' Meeting).—Mr. W. G. Bannister on "The Premium System of Payment for Labour." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor R. Elsey Smith on "Sanitary Building Construction and Planning; Soil and Local Physical Conditions." 7 p.m.

Junior Institution of Engineers.—Visit to the Works of the Electrical Power Storage Company, Millwall. 3 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. J. I. Little on "Sewage Disposal of Country Houses." 8 p.m.

SATURDAY, MARCH 12.

Royal Institution.—Right Hon. Lord Rayleigh on "The Life of Stokes," IV. 3 p.m.

Edinburgh Architectural Association.—Visit to the Midlothian County Buildings, George IV. Bridge.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage and Destructor Works, Ealing. 2.15 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks.....	1	16	0	per 1000	alongside, in river.	
Rough Stocks and Grizzles.....	1	13	0	"	"	"
Facing Stocks ...	2	12	0	"	"	"
Shippers	2	10	0	"	"	"
Flettons	1	10	0	"	at railway depôt.	
Red wire Cuts ..	1	13	0	"	"	"
Best Fareham Red	3	12	0	"	"	"
Best Red Pressed Ruabon Facing	5	0	0	"	"	"
Best Blue Pressed Staffordshire ..	4	4	0	"	"	"
Do. Bullnose	4	10	0	"	"	"
Best Stourbridge Fire Bricks....	4	8	0	"	"	"
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	13	0	0	"	"	"
Headers	12	0	0	"	"	"
Quoins, Bullnose, and Flats	17	0	0	"	"	"
Double Stretchers	19	0	0	"	"	"
Double Headers..	16	0	0	"	"	"
One Side and two Ends	19	0	0	"	"	"
Two Sides and one End	20	0	0	"	"	"
Splays, Chamfered, Squints .	20	0	0	"	"	"
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	"	"	"
Quoins, Bullnose, and Flats	14	0	0	"	"	"
Double Stretchers	15	0	0	"	"	"
Double Headers..	14	0	0	"	"	"
One Side and two Ends	15	0	0	"	"	"
Two Sides and one End	15	0	0	"	"	"
Splays, Chamfered, Squints..	14	0	0	"	"	"
Second Quality White and Dipped Salt Glazed	2	0	0	"	less than best.	

	s.	d.		
Thames and Pit Sand.....	7	3	per yard,	delivered.
Thames Ballast	6	0		
Best Portland Cement	29	0	per ton,	"
Best Ground Blue Lias Lime	20	6	"	"

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fire Clay in sacks 27s. 6d. per ton at riy. dpt.

STONE.

	s.	d.		
BATH STONE—delivered on road waggons, Paddington depôt.....	1	6½	per ft. cube.	
Do. do. delivered on road waggons, Nine Elms depôt	1	8½	"	"
PORTLAND STONE (20 ft. average)—				
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf..	2	1	"	"
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf ..	2	2½	"	"

	s.	d.		
Ancaster in blocks	1	11	per ft. cube,	deld. riy. depôt.
Beer in blocks	1	6	"	"
Greenshill "	1	10	"	"
Darley Dale in blocks ..	2	4	"	"
Red Corsehill "	2	5	"	"
Closeburn Red Freestone	2	0	"	"
Red Mansfield "	2	4	"	"

YORK STONE—*Robin Hood Quality.*

	s.	d.		
Scappled random blocks	2	10	per ft. cube,	deld. riy. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per foot super.	"
6 in. rubbed two sides ditto, ditto	2	6	"	"
3 in. sawn two sides slabs (random sizes)	0	11½	"	"
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	"	"
1½ in. to 2 in. ditto, ditto	0	6	"	"
HARD YORK—				
Scappled random blocks	3	0	per ft. cube	"
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super.	"
6 in. rubbed two sides Ditto	3	0	"	"
3 in. sawn two sides slabs (random sizes)	1	2	"	"
2 in. self-faced random flags	0	5	"	"
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube,	deld. riy. depôt.
" " " 6 in. sawn both sides landings	2	7	per ft. super.	deld. riy. depôt.
" " " 3 in. do.	1	2½	"	"

SLATES.

in.	in.	£	s.	d.		
20 × 10 best blue Bangor		13	2	6	per 1000 of 1200 at r. d.	
20 × 12	" "	13	17	6	"	"
20 × 10 best seconds	"	12	15	0	"	"
20 × 12	" " "	13	10	0	"	"
16 × 8	" " "	7	0	0	"	"
20 × 10 best blue Portmadoc		12	12	6	"	"
16 × 8 best blue Portmadoc		6	12	6	"	"
20 × 10 best Eureka unfading green ..		15	2	6	"	"
20 × 12 best Eureka unfading green ..		17	2	6	per 1000 of 1200 at r. d.	
18 × 10	" "	12	10	0	"	"
16 × 8	" "	10	5	0	"	"
20 × 10 permanent green		11	10	0	"	"
18 × 10	" "	9	10	0	"	"
16 × 8	" "	6	10	0	"	"

TILES.

	s.	d.		
Best plain red roofing tiles..	42	0	per 1000 at	riy. depôt
Hip and Valley tiles ..	3	7	per doz.	" "
Best Broseley tiles.....	50	0	per 1000	" "
Do. Ornamental tiles	52	6	"	" "
Hip and Valley tiles ..	4	0	per doz.	" "
Best Ruabon red, brown or brindled do. (Edwards)	57	6	per 1000	" "
Do. Ornamental do.	60	0	"	" "
Hip tiles	4	0	per doz.	" "
Valley tiles	3	0	"	" "
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000	" "
Do. Ornamental do.	54	6	"	" "
Hip tiles	4	1	per doz.	" "
Valley tiles	3	8	"	" "
Best "Rosemary" brand plain tiles	48	0	per 1000	" "
Best Ornamental tiles	50	0	"	" "
Hip tiles	4	0	per doz.	" "
Valley tiles	3	8	"	" "
Best "Hartahill" brand plain tiles, sand faced.	50	0	per 1000	" "
Do. pressed	47	6	"	" "
Do. ornamental, do.	50	0	"	" "
Hip tiles	4	0	per doz.	" "
Valley tiles.....	3	6	"	" "

WOOD.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	15	10	0	16	10	0
Deals: best 3 by 9.....	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0	12	10	0
Battens: best 2½ by 6 and 3 by 6..	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	" "	"	0
2 in. by 4 in. and 2 in by 6 in. ..	9	0	0	9	10	0
2 in. by 4½ in. and 2 in. by 5 in...	8	10	0	9	10	0
Foreign Sawn Boards—						
1 in. and 1¼ in. by 7 in.....	0	10	0	more than battens.		
¾ in.....	1	0	0			
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)....	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	6	3	10	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft. average)..	3	5	0	3	15	0
JOINERS' WOOD.						
White Sea: first yellow deals, 3 in. by 11 in.....	At per standard. 23	0	0	24	0	0
3 in. by 9 in.....	21	0	0	22	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	18	10	0
Second yellow deals, 3 in. by 11 in.....	18	10	0	20	0	0
" " 3 in by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.....	15	10	0	16	10	0
Battens, 2½ in. and 3 in by 7 in.	11	10	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.....	18	0	0	19	10	0
Battens.....	13	10	0	15	0	0
Petersburg: second yellow deals, 3 in. by 11 in.....	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens.....	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.....	13	10	0	14	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg :—						
First white deals, 3 in. by 11 in..	14	10	0	15	10	0
" " 3 in. by 9 in..	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
" " 3 in. by 9 in.	12	10	0	13	10	0
" " battens	9	10	0	10	10	0
Pitch-pine : deals	16	10	0	20	0	0
Under 2 in. thick extra.....	0	10	0	1	0	0
Yellow Pine—First, regular sizes	35	0	0	upwards.		
Oddments	24	0	0	26	0	0
Seconds, regular sizes	26	10	0	28	10	0
Yellow Pine oddments	22	0	0	24	0	0
Kauri Pine—Planks, per ft. cube ..	0	3	6	0	5	0
Danzig and Stettin Oak Logs—						
Large, per ft. cube.....	0	2	6	0	3	6
Small " "	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube..	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	7	0	0	8
¾ in. do. do.	0	0	6½	—		
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch....	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	21	0	0
American Whitewood Planks— per ft. cube.....	0	4	0	—		
Prepared Flooring—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
¾ in. by 7 in. do. do. do.	0	14	0	0	18	0
1 in. by 7 in. white do. do.	0	10	9	0	11	6
1 in. by 7 in. do. do. do.	0	11	6	0	13	6

6 in. at 6d. to 9d. per square less than 7 in.

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JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ..	7 5 0
Compound Girders, ordinary sections	8 2 6 ..	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ..	8 17 6
Flitch Plates	8 5 0 ..	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ..	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 5 0 ..	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0 ..	8 5 0
Staffordshire "Marked Bars"	10 0 0 ..	—
Mild Steel Bars	8 15 0 ..	9 5 0
Hoop Iron, basis price	9 5 0 ..	9 10 0
" " galvanised	17 10 0 ..	—
("And upwards, according to size and gauge.)		
Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ..	—
" " 24 g.	10 15 0 ..	—
" " 26 g.	12 5 0 ..	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 8 ft. to 20 g.	12 15 0 ..	—
Ordinary sizes to 22 g. and 24 g	13 5 0 ..	—
" " 26 g.	14 5 0 ..	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ..	—
" " 22 g. and 24 g.	16 10 0 ..	—
" " 26 g.	18 0 0 ..	—
Galvanised Corrugated Sheets—		
Ordinary sizes, 6 ft. to 8 ft. 20 g	12 10 0 ..	—
" " 22 g. and 24 g.	13 0 0 ..	—
" " 26 g.	13 15 0 ..	—
Best Soft Steel Sheets, 6ft. by 2ft. to 3 ft. by 20 g. and thicker..	11 15 0 ..	—
Best Soft Steel Sheets, 22 g. & 24 g	12 15 0 ..	—
" " 26 g	14 0 0 ..	—
Cut nails, 3 in. to 6 in.	9 0 0 ..	9 10 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 7 6 ..	—
Pipe in coils	14 17 6 ..	—
Soil pipe	17 7 6 ..	—
Compo pipe	17 7 6 ..	—
ZINC—Sheet—		
Vieille Montagne ..... ton	26 5 0 ..	—
Silesian	26 0 0 ..	—
COPPER—		
Strong Sheet ..... per lb.	0 0 10½ ..	—
Thin "	0 0 11½ ..	—
Copper nails ..... "	0 0 11 ..	—
BRASS—		
Strong Sheet ..... per lb.	0 0 10 ..	—
Thin "	0 0 11 ..	—
TIN—English Ingots .... "	0 1 4 ..	—
SOLDER—Plumbers' .... "	0 0 6½ ..	—
Tinmen's ..... "	0 0 8 ..	—
Plowpipe ..... "	0 0 9 ..	—

ENGLISH SHEET GLASS IN CRATES.

	2d. per ft. delivered.
15 oz. thirds	2d. per ft. delivered.
" fourths	1½d. " "
21 oz. thirds	3d. " "
" fourths	2½d. " "
26 oz. thirds	3½d. " "
" fourths	3d. " "
32 oz. thirds	4½d. " "
" fourths	4d. " "
Fluted sheet, 15 oz.	2½d. " "
" 21 oz.	3½d. " "
½ Hartley's Rolled Plate	1½d. " "
⅝ " " "	1¾d. " "
¾ " " "	2½d. " "

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes or barrels .. per gallon	0 1 8
" " " in drums .. "	0 1 11
Boiled " " in pipes or barrels .. "	0 1 11
" " " in drums .. "	0 2 2
Turpentine, in barrels .. "	0 3 10
" in drums .. "	0 4 0
Genuine Ground English White Lead per ton	19 0 0
Red Lead, Dry "	19 0 0
Best Linseed Oil Putty .. per cwt.	0 7 6
Stockholm Tar .. per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 28s. per annum. Remittances (payable to J. MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

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J. W. A.—J. K. & SONS—W. B. (Amounts should have been stated).—F. P. T. (Below our limit).—C. B.—R. G. (We do not publish lists of tenders unless amounts are stated, except when the work is tendered for on a schedule of prices).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER and *not* to the Editor.

PUBLISHER'S NOTICES.

Nat. Tel., 6113, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXV. (July to December, 1903) was given as a supplement with issue of January 9 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each.

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Six lines, or under ..... 6s. 0d.
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Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE noon on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS advertising in "THE BUILDER" may have *Replies addressed to the Office*, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BURNLEY.—For 850 yards lineal of 9 in. earthenware pipe sewer, from Queen-street, Harle Syke, to Haggate, for the Rural District Council. Mr. S. Edmondson, Surveyor to the Council:—

	£ s. d.		s. d.
T. Rowland	541 1 0	Rock Cutting	4 6
G. Hunter	532 12 0	do.	10 0
J. MacCabe & Co.	528 14 0	do.	5 0
H. Prescot & Co.	478 0 0	do.	8 6
French & Clough	451 3 0	do.	6 0
J. Wadge	447 12 0	do.	10 0
E. Heap	441 5 0	do.	7 6
Clegg Bros.	425 0 0	do.	6 0
J. R. Atkinson, Colne*	409 12 0	do.	6 0
J. R. Mills	401 10 0	do.	8 0

BRENTWOOD.—For diversion of main sewer in James-road, for the Urban District Council. Mr. J. E. Fothergill, Surveyor:—

R. Claydon, Brentwood* £452 17 6

CAERAU (Maesteg).—For the erection of a workmen's library, institute, etc., for the Trustee. Messrs. E. W. Burnett & Son, architects, Tondu and Maesteg:—

John Jenkins £2,925 0 0
Stephen Lewis 2,895 0 0
John Nicholas, Port Talbot* 2,495 0 0

[Architects' estimate, £,2650.]

CARDIFF.—For foundations for a new cricket pavilion, Cardiff Arms Park. Messrs. Veall & Sant, architects, Cardiff. Quantities by architects:—

R. W. Hunter.	£531 15 11	F. Small	£435 0 0
J. Allan	520 0 0	J. Thomas	432 0 0
H. Gibbon	497 0 0	W. Symonds & Co.	398 8 0
W. Thomas & Co.	474 19 0	Melhuish Bros.	375 0 0
F. Ashley	468 3 1	J. E. Williams.	367 4 11
Turner & Sons.	458 0 0	Gibson Bros*...	352 0 0
Knox & Wells.	437 0 0		

[All of Cardiff.]

COEDSAESON.—For erecting a villa at Coedsaeson, near Swansea. Mr. C. T. Ruthen, architect, Bank chambers, Heathfield-street, Swansea:—

J. D. Jones	£1,060 16 3	Jones, Price, & Co.	£775 0 0
John Davies	950 0 0	Charles Maries	755 0 0
David Jenkins	867 0 0	Lloyd Bros., Argyle-street, Swansea*‡	748 10 0
Griffith Davies	855 0 0		
J. & D. Jones.	800 0 0		
J. Maries & Sons	785 0 0		

‡ This amount does not include plumbing and ironmongery.

COVENTRY.—For road works, Brick Kiln-lane, and 12-in. stoneware surface water pipe sewer, &c., for the Corporation. Mr. J. E. Swindlehurst, City Engineer, Saint Mary's Hall, Coventry:—

W. Boon & Sons, Nuneaton £1,767 19 6

DARWEN.—For the erection of a Sunday school at Lower Darwen, Lancs., for the United Methodist Free Church. Messrs. Sames & Green, architects, Knowl-street, Darwen:—

R. Leigh	£3,414	R. Shorrock	£3,190
T. Lightbown	3,200	J. Knowles, Darwen*	2,750

DUTTON (near Preston).—For the erection of an isolation hospital, Dutton, near Preston Brook, for the Runcorn Rural District Council. Mr. G. E. Bolshaw, architect, 189, Lord-street, Southport:—

W. Nickson & Sons	£7,510 0 0	R. Neill & Sons	£6,465 0 0
S. Appleton.	7,475 0 0	Hughes & Stirling	6,439 0 0
J. Tinline.	7,462 0 0	Dryland & Preston	6,348 2 5
A. White & Sons	7,307 3 2	R. Hall	6,222 0 0
Beckett & Co.	7,243 10 0	H. Fairclough	6,073 0 0
S. Butterworth & Sons, Ltd.	6,800 0 0	E. Marshall & Sons, Ltd., Ashton-under-Lyne*	5,930 0 0
A. K. Irving & Sons	6,730 0 0	J. Gerrard & Son	not given
Moore Bros.	6,668 10 0		
J. Dolan	6,595 0 0		
S. Warburton	6,500 0 0		

[Architect's estimate, £6,820.]

EASTBOURNE.—For the erection of a private dwelling house, Blackwater-road, Eastbourne, for Mr. Ralph H. Burdett, of De Walden Court, Eastbourne. Mr. Bertram Earp, architect, 134, Terminus-road, Eastbourne:—

Joseph Martin	£2,450 0 0	E. Cornwell & Son	£2,245 0 0
C. Peerless-Dennis & Co.	2,440 0 0	Mark Martin*	1,999 19 10

[All of Eastbourne.]

EAST LANGDON.—For the erection of buildings at Langdon Court Farm, for the Right Hon. the Earl of Guilford. Messrs. Fry & Miller, architects, Cannon-street, Dover:—

Hayward & Paramor	£799 6 6	Austen & Lewis	£759 0 0
Lewis & Sons	785 0 0	W. Bromley, Dover*	735 0 0
R. & G. Brisley	760 0 0		

[Architects' estimate, £750.]

EASTLEIGH (Hants). — For erecting new Baptist Christian church for the Trustees. Mr. H. Hall, architect, West End, Southampton. Quantities by builder:—

R. H. Bundey £1,950
J. Nichol, Bitterne Park, Southampton* 1,772

HANLEY.—For 12,000 sq. syds. of tar pavement on walks and drives in Hanley Park, Staffs. Mr. J. Lobley, Borough Engineer, Town Hall, Hanley:—

John Edwards	£1,900 0 0	Josiah Smart	£1,245 16 8
Asphaltic Limestone Concrete Co., Ltd.	1,326 0 0	Asphaltes United	1,200 0 0
J. Wainwright & Co.	1,325 0 0	F. O. Sheppard	1,179 3 4
John Cooke	1,316 13 4	James Brook	1,175 0 0
W. H. & B. Stansbury	1,275 0 0	A. Kershaw	1,166 13 4
Daniel Boulton	1,266 13 4	Haigh & Co.	1,150 0 0
F. Mitchell & Son	1,258 6 8	La Brea Asphalte Co.	1,125 0 0
F. Barke	1,258 6 8	Wm. Sheppard, Rochdale*	1,100 0 0
Val de Travers Co.	1,258 6 8	N. of Eng. Asphalte Co., Manchester‡	1,075 0 0

‡ Slag; all the rest for limestone

HORNCASTLE (Lincs.).—For the supply of about 5,945 tons of granite and about 1,550 tons of slag for the Rural District Council:—

Granite.

	s. d.
Mountsorrel Granite Co., Mountsorrel, 6,000 tons	11 3

Slag.

Holwell Iron Co., Asfordby, 1,000 tons	6 9
W. S. White & Co., Lincoln, 550 tons	6 8

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KEIGHLEY.—For the erection of a new Board School, Long Lee for the School Board (U.D.). Mr. A. P. Harrison, architect, 18, Cooke-lane, Keighley:—

Mason: M. Sunderland, Mannville-rd, Keighley.
Joiner: R. Binns, Heber-street, Keighley ....
Plumbers: W. & J. Harrison, 23, South-street, Keighley .....
Slaters: W. Thornton & Son, Bromley-road, Bingley ..... } £2,280
Plasterers: H. Spurr & Son, Bingley .....
Painter: F. Petty, Laukholme-lane, Keighley..
Heating Engineer: Clapham Bros., Wellington Foundry, Keighley .....

KEIGHLEY.—For the erection of a Liberal club in Bradford-road, for the North-East Ward, Liberal Club Buildings Co., Ltd. Messrs. J. Haggas & Sons, architects, North-street, Keighley:—

Mason: E. Turner ....
Joiner: J. Wilkinson ..
Slater: W. Thornton ..
Plasterer: A. Sawley ..
Plumber: J. S. Harrison
Painter: R. Lonsdale .. } All of Keighley. £580 0 0

LEICESTER.—Extension of Machine Shop (steelwork only), for Messrs. Taylor & Hubbard, crane makers. Messrs. Tait & Herbert, architects, Leicester and Coventry:—

Whessoe Foundry Co.	£1,439 0 0
Gimson & Co., Ltd.	1,139 6 4
Edward Wood, Ltd.	1,100 0 0
Needham & Lowe, Leicester*	1,086 12 0

LEIGH-ON-SEA (Essex).—For making-up Hadleigh-road (part of), Fairleigh-drive, and Leigham Court-drive (part of), for the Urban District Council. Mr. W. J. Petch, Surveyor. Quantities by the Surveyor:—

Hadleigh-road.

G. Bell	£2,299 8 0	E. Lamble	£1,765 0 0
H. S. Higgins	2,027 15 5	Buxton & Jenner	1,751 0 0
J. Summerfield	1,987 19 6	W. Iles, South-end-on-Sea*	1,716 0 0
H. E. Johnson	1,921 6 5		
R. Ballard & Co.	1,895 0 0		

Fairleigh-drive.

J. J. Galer	£1,612 1 0	E. Lamble	£1,302 15 6
G. Bell	1,607 0 0	W. Iles, South-end-on-Sea*	1,248 10 0
R. Ballard & Co.	1,425 0 0	Buxton & Jenner	1,236 0 0
H. E. Johnson	1,404 4 2		
J. Summerfield	1,321 14 8		

Leigham Court-drive.

G. Bell	£482 15 0	J. Summerfield	£358 6 3
J. J. Galer	464 0 6	W. Iles	350 18 0
E. Lamble	429 18 4	Buxton & Jenner, Southend-on-Sea*	344 6 0
R. Ballard & Co.	422 0 0		
H. E. Johnson	388 17 10		

LOCHMADDY (Scotland).—For alterations to Public School and erection of teachers' dwelling-house, for the North Uiss School Board:—

D. Fletcher	£1,000 18 0	W. Bain, Lochmaddy, N.B.*	£800 0 0
D. M. Tavish	928 14 4		

LONDON.—For the erection of shelters in brick and half-timber work at the South Park, Fulham, for the Fulham Borough Council. Mr. F. Wood, A.M.Inst.C.E., Borough Engineer, Fulham:—

Spiers & Son	£644 0 0	T. Pearce	£550 0 0
Foster Bros.	628 0 0	T. Bendon	525 13 0
S. Dockerill	598 0 0	Surveyor's estimate	530 0 0
W. Norton	578 0 0		
H. Dakin & Co.	560 15 0		

[The Council has been recommended to carry out the work by the Borough Surveyor, at his estimate.]

LONDON.—For extension of electric light installation at Marshall-street Baths, for the Westminster City Council:—

Tamplin & Co.	£405 0 0	Taylor & Co.	£263 0 0
Rider & Co.	359 7 0	Bakewell & Co.	258 11 0
District Electric Co.	269 0 0	Bromley & Co.	236 8 0
Jackson Bros.	265 0 0	Potter & Sons	208 0 0

LONDON.—For new corridor to entrance lodge at Norwood Schools, for the Lambeth Guardians. Mr. S. R. J. Smith, architect, 15, York-buildings, Adelphi, W.C. Quantities by architect:—

		Time.
A. Acworth	£220 0	3 months.
W. J. Coleman & Co.	169 13	6 weeks.
Crabb & Son	195 0	—
R. Goodman & Sons	225 10	2½ months.
Hammond & Son	190 0	3 months.
H. Kent	169 0	5 weeks.
E. Mills	175 0	2 months.
T. Pearce	192 0	—
F. J. Wheeler	174 5	1 month.
G. Jennings, Ltd., Lambeth Palace-road, S.E.*	130 0	2 months.

LONDON.—For sole-plates for track-rails required in connexion with the London County Council's tramways north and south of the Thames:—
Bolckow, Vaughan, & Co., Ltd.* £3,497

LONDON.—For hydraulic penstock, Counter's-creek Sewer, Lots-road Pumping Station, for the London County Council:—

Clark, Bunnett, & Co., Ltd.	£207 0 0
Glenfield & Kennedy, Ltd.	196 0 0
J. Blakeborough & Sons	187 8 0
Hunter & English*	165 0 0

LONDON.—For repairs to beams of main engines, Western Pumping Station, for the London County Council:—

James Simpson & Co., Ltd.	£900 0 0
Richard Moreland & Sons, Ltd.	613 0 0
Lavell & Churchill*	370 0 0

LONDON.—For the erection of new business premises in Drury-lane and Kean-street, W.C. Mr. H. Phelps Drew, architect, 33, King-street, Covent-garden. Quantities by Mr. J. Rookwood, 25, Bedford-row, W.C.:—

Turtle & Appleton	£7,680	Higgs & Hill	£7,194
T. L. Green	7,387	McCormick & Son	6,930
Patman & Fotheringham	7,273	Ashby & Horner*	6,904
		Hibberd Bros.	6,733

LONDON.—For the erection of a refreshment-room and kitchen at the Cricket Pavilion, Victoria Park, E., for the London County Council:—

W. D. Tucker	£481 17 5	S. Kind	£350 0 0
J. Jarvis & Sons	417 0 0	Cons & Smith	340 15 0
R. Woollaston & Co.	383 16 9	Foster Bros.	313 10 0
E. Jones	380 2 0	F. & T. Thorne	313 0 0
R. A. Dean & Co.	377 7 4	T. G. Sharpington	308 10 0
P. King & Co.	377 0 0	T. Pearce, Thornton & Heath*	304 10 0
M. Calnan & Son	350 0 0		

LONDON.—For roads and sewers on section B of White Hart-lane Estate, Wood Green, for the London County Council:—

Martin, Wells, & Co., Ltd.	£8,327 0 0
A. B. Champness	8,294 12 11
W. Griffiths & Co., Ltd.	7,753 11 5
J. Macklin	7,616 12 2
T. Adams	7,386 14 4
J. & E. Bloomfield	6,955 0 0
Grounds & Newton	6,836 15 4
R. Ballard, Ltd.	6,657 0 0
F. J. Coxhead, 45, Bulwer-road, Leytonstone*	6,464 0 0

[Architect's estimate, £7,370.]

LONDON SCHOOL BOARD TENDERS.

Shap-street School, Kingsland-road: for Halls and other Improvements.

Boys' department: Providing new hall about 61 ft. by 25 ft. 4½ in.; new staircase, clock-room, lavatory, and teachers' rooms; redividing, restepping, and relighting existing classrooms. *Girls' department:* Providing new hall about 61 ft. by 25 ft. 4½ in.; new staircase, cloakroom, lavatory and teachers' rooms; re-stepping and relighting existing classrooms. *Infants' department:* Providing new hall about 61 ft. by 25 ft.; new cloakrooms and lavatory; restepping and relighting two classrooms; providing drawing classroom and science room, area 600 ft. each; providing new heating chamber and low-pressure hot-water apparatus; also new lift. Revised accommodation:—Boys', 312; girls', 337; infants', 384; total 1,033. Net loss of 32 places:—

G. S. S. Williams & Son	£12,890	J. Grover & Son	£12,650
Clarke & Brassey	12,888	F. & F. J. Wood	12,581
McCormick & Sons	12,862	C. Dearing & Son	12,559
A. Porter	12,850	E. Lawrance & Sons	12,459
W. Gregar & Son	12,819	Treasure & Son	12,201
W. M. Dabbs	12,724	C. Miskin & Sons	12,079
L. H. & R. Roberts	12,659	J. Chessum & Sons*	11,651

Wood-street School, Woolwich: for Improvements.

Re-dividing, re-lighting, and re-stepping existing classrooms in each department; forming new classroom for thirty-six out of existing halls for boys' and infants' departments; forming new corridor on second floor over hall in girls' department; forming new sixty classroom for each department. Heating by low-pressure hot-water apparatus. Revised accommodation:—Boys', 336; girls', 420; infants', 372; total, 1,128. Net loss of seventy-two places:—

G. E. Wallis & Sons	£4,122 0	W. Akers & Co.	3,600 0
T. L. Green	4,038 0	T. D. Leng	3,584 0
A. E. Symes	3,961 10	Rice & Son	3,548 0
Holliday & Greenwood, Ltd.	3,812 0	J. Garrett & Son	3,519 0
Treasure & Son	3,808 0	E. P. Bulled & Co.	3,469 0
Thomas & Edge	3,789 0	Edwards & Medway	3,432 0
J. Appleby & Sons	3,722 0	W. Harris*	3,323 0

Plassy-road Site, Catford: for Special School for Sixty Mentally Defective Children.

J. & C. Bowyer* £3,487

Telferscot-road Site, Balham: for the Erection of Mentally Defective School for Older Boys.

Messrs. W. Johnson & Co., Ltd. (the Contractors who are now erecting a new school on the Telferscot-road site, Balham), recommended for acceptance; upon the understanding that the cost of the work, which is estimated at £2,807, shall be calculated upon the Contractors' Schedule of Prices for the new school.

Sussex-road Site, Brixton: for Third Class-room in connexion with the Special School.

Messrs. W. J. Mitchell & Son to provide the additional classroom upon the understanding that the cost of the work, which is estimated at £360, shall be calculated as a variation on their contract for the Special School.

Devons-road (New School): Bromley, for Heating Apparatus.

Stevens & Sons	£900	J. Wortner-Smith, Gray & Co.	£706 15
J. & F. May	760	J. Fraser & Son	689 0
W. G. Cannon & Sons	755	Werner, Pfleiderer & Perkins, Ltd.*	665 0
J. Yetton & Co.	735		
J. Richmond & Co., Ltd.	720		

"Ben Johnson" School, Stepney: for Altering Windows and Improving Ventilation of all Departments.

G. S. S. Williams & Son	£1,285	J. Haydon & Sons	£1,170 0
F. & F. J. Wood	1,201	A. J. Sheffield	1,150 0
G. Barker	1,187	Parrott & Isom	1,133 0
J. T. Robey	1,183	Vigor & Co.	1,076 10
Stevens Bros.*	£996 (reduced to £858.)		

Kender-street School, Hatcham: for Works to Boys' Offices.

W. Downs	£400	H. Groves	£310
G. Kemp	394	J. W. Falkner & Sons	297
Maxwell Bros., Ltd.	392	H. Leney & Son*	245
J. & C. Bowyer	385		
G. Parker	370		

Running Contract for Framing and Mounting Drainage Plans.

	A	B	C
	For framing complete, including glass, etc. per ft. super. s. d.	For mounting tracings (double elephant size). per ft. super. s. d.	For mounting, etc., tracing, (larger than double elephant size) per ft. super. s. d.
Muller & Co.	1 6	0 6	0 9
Norton & Gregory Ltd.*	0 11	0 3	0 4
Wolffe & Co.†	0 10	0 3	0 4½
A. Woodgate	1 0	0 2½	0 4½
Present Prices	0 10	0 2	0 3

[Existing Contract will expire February 26, 1904.]
: This firm state that they will not be responsible for any tracings damaged during mounting.

Running Contract for the supply of Clips for Map and Stock Cupboards.

	per doz. s. d.		per doz. s. d.
F. Bird & Co.	6 0	Pryke & Palmer	3 9
J. Frankling & Son	6 0	Carter & Aynsley, Ltd.*	2 6
G. W. Seymour	4 6		
H. & C. Davis & Co., Ltd.	4 0		

Cleaning and Painting (List 1).

The interior work at the following schools will be executed between March 12, 1904, and April 9, 1904; and the exterior painting between March 12 and April 16, 1904:—

Waterloo-street, Painting Interior (Old Portion), Cleaning Interior (New Portion), and Painting Exterior (all Buildings).

W. Hornett	£717 0	W. R. & A. Hide	£568 15
C. F. Kearley	657 0	F. Chidley & Co.	504 0
Macey & Sons, Ltd.	632 0	W. Browne & Sons*	420 9
S. Polden	615 0		
J. & M. Patrick	570 0		

Edward-street, Cleaning and Painting Interior.†

W. Hayter & Son	£280 0	T. D. Leng	£196 0
W. J. Howie	259 0	H. Groves	171 0
C. G. Jones	226 0	S. E. Musgrove*	128 2

: In this case the work will be executed between March 19 and April 9, 1904.

Larkhall-lane, Cleaning Interior.

Martin, Wells, & Co., Ltd.	£190 0	E. B. Tucker	£126 0
Rice & Son	145 0	Hudson Bros.	125 10
E. Triggs	131 0	Maxwell Bros., Ltd.	114 0
		J. Garrett & Son*	97 0

Riley-street, Painting Interior and Exterior.

J. Greenwood, Ld.	£481 0	E. P. Bulled & Co.	£443 10
Vigor & Co.	454 0	W. Sayer & Son	423 0
Bargman, Son & Co.	448 0	H. J. Williams	398 0
		E. Proctor & Son*	325 0

Fairfield-road, Painting Interior.

W. Silk & Son	£250 0	J. Haydon & Sons	£221 15
Vigor & Co.	245 0	R. Woollaston & Co.	182 10
A. E. Symes	242 0	J. F. Holliday*	175 15
J. Dolman & Co.	227 0		
A. J. Sheffield	226 10		

NANTWICH.—For cast-iron water-pipes, etc., Chorlton Hough, etc., for the Rural District Council. Mr. J. A. Davenport, C.E., 152, Hospital-street, Nantwich. Quantities by engineer:—

For Cast-iron Pipes.

Clay Cross Co., Clay Cross, near Chesterfield* £638 12 5

For Hydrants, Sluice Valves, etc.

J. Blakeboro' & Son, Brighouse, Yorks.* .. £62 8 6

NANTWICH.—For excavating for, and laying, etc., cast-iron water-pipes, Chorlton Hough, etc., for the Rural District Council. Mr. J. A. Davenport, C.E., 152, Hospital-street, Nantwich. Quantities by engineer:—

J. A. Ewart	£554 15 6	Arthur Fletcher	£303 6 0
T. H. Simmons	542 15 3	Jno. Dodd	287 10 0
Binnie & Thompson	427 16 0	Jno. Peake & Son, Willaston*	233 10 0
F. Whitelocke	371 4 0		

NARBOROUGH (Leicestershire).—For the erection of a new Asylum for about 700 patients, together with entrance lodge, church, etc., etc., for the Committee of Visitors, Leicestershire and Rutland County Lunatic Asylum. Messrs. Everard & Pick, architects, Millstone-lane, Leicester:—

Jos. Howe & Co.	£239,483 0 0
R. Wilkins & Sons	232,780 0 0
John Shillitoe & Son	230,591 0 0
Pethick Brothers	229,944 0 0
Foster & Dicksee	229,944 0 0
J. E. Johnson & Son	226,990 0 0
Robt. Neill & Sons	222,200 0 0
Hy. Willcock & Co.	219,750 0 0
J. Chessum & Sons	218,350 0 0
McCormick & Sons	217,345 0 0
Haskard, Rudkin & Beck	216,455 0 0
Armitage & Hodgson	213,087 0 0
John Bowen & Sons	210,998 0 0
Hy. Herbert & Sons	209,975 0 0
S. F. Davidson	209,940 0 0
Wm. Maule & Co.	209,625 0 0
Harold Arnold & Son	207,613 0 0
W. Pattinson & Sons	203,816 0 0
Jas. Wright	201,471 0 0
Wm. Brown & Sons	196,900 0 0
J. Hodson & Son	196,557 0 0
John Dallow & Sons	196,550 0 0
Geo. Longden & Sons, Ltd.	195,926 12 3
O. Wright & Co.	193,911 3 2
Thos. Fish & Sons	192,587 0 0
J. Parnell & Son	184,233 0 0
Thos. Rowbotham	184,200 0 0
Wm. Moss & Sons, Ltd., 39, Baxter-gate, Loughborough*	179,909 0 0

TENDERS—*Continued on page 269*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom required.	Premiums.	Designs to be delivered
Twenty-five Houses, Park Hill, Tredegar	Tredegar Ch'b'r of Trade Bldg. Club	.....	Mar. 7
Free Library, etc., and Town Hall, Victoria Park	Tipton U.D.C.	50*l.*, 20*l.*, 10*l.* (limited to Architects in district)	Mar. 31
Two Libraries, Selly Oak and Stirchley, respectively	King's Norton and Northfield U.D.C.	Premiums not stated (limited to Archs. in district and Birm'gh'm)	April 5
Branch Library, Northfield	do.	do.	do.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Materials	Marylebone Borough Council	The Town Hall, St. Marylebone, W.	Mar. 7
Materials	Bridgend U.D.C.	M. Williams, Engineer, Council Offices, Bridgend, Glamorganshire	do.
Drainage Works	Hale U.D.C.	J. G. Whyatt, Clerk, Public Offices, Ashley-road, Hale, Cheshire	do.
Repairs and Repainting at Baths	Lewisham Borough Council	E. Wright, Town Hall, Catford, S.E.	do.
130 Rods of Railway Post and Rail Fence at Cemetery	do.	do.	do.
Scavenging, etc.	Handsworth U.D.C.	B. Powell, Surveyor, Council Offices, Woodhouse	do.
Making-up and Stormwater Drainage of Park-lane	do.	do.	do.
Repair of District Roads	Bradfield R.D.C.	J. Forrester, District Surveyor, Theale, near Reading	do.
Steam Fire Engine	Cheadle and Gatley U.D.C.	E. Sykes, Surveyor to Council, High-st., Cheadle, nr. Manchester	do.
Teacher's Residence at Roshine, Burtonport	.....	Mr. Pinkerton, Shipquay-street, Londonderry	do.
Three Small Streets in Selby-st. and Woodcock-st.	Hull Estates Co., Ltd.	Gelder & Kitchen, Architects, 76, Lowgate, Hull	do.
Workshop and Warehouse, Sun-street, Gateshead	H. Hall	J. M. Dingle, Architect, 3, Ocean-road, South Shields	do.
Two Cottage Homes at Shenley Fields	King's Norton Guardians	T. Jones, 12, Warwich-chambers, Corporation-street, Birmingham	do.
Alterations, etc., to Woodstock House	Dr. Lloyd	E. Foster, Architect, Bella Vista, Abergavenny	Mar. 8
Causewaying of Alloway-street and Beresford-terrace	Ayr Corporation	J. Young, Town Surveyor, Town-buildings, Ayr	do.
Stores, Dalton, near Rotherham	Masboro' Equit. Pioneers' Soc., Ltd.	H. L. Tacon, Architect, 11, Westgate, Rotherham	do.
Vicarage, Bedminster	.....	W. V. Gough, Architect, 24, Bridge-street, Bristol	do.
Improvement Works in Passage	Bootle Corporation	Borough Surveyor's Office, Bootle	do.
Stores (Electricity Department)	Ilford U.D.C.	Electrical Engineer, Electricity Works, Ley-street, Ilford	do.
Pair of Semi-Detached Houses, Stump Cross, Halifax	.....	J. F. Walsh and G. Nicholas, Architects, Museum-chamb., Halifax	do.
Fire Appliances, Plymouth Workhouse	The Guardians	Master of Workhouse, Plymouth	do.
Extension of Boiler House, Wolverhampton-street	Walsall Corporation	A. Wyllie, Borough Elec. Engineer, Wolverhamton-st., Walsall	do.
Detached Residence in Cardigan-road, Bridlington	Mrs. Bentley	J. Earnshaw, Architect, Carlton-house, Bridlington	do.
Villa at Abersoch	.....	Mrs. Griffiths, Bryn Mor, Abersoch, Wales	do.
Painter Work, Fish Market Extension	Glasgow Corporation	A. B. M'Donald, City Engineer, City-chambers, Glasgow	do.
*Refuse Destructor Buildings	Bromley Borough Council	Borough Engineer, Bromley, Kent	do.
Materials	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	Mar. 9
Alfred-street Stormwater Culvert	Birm'gh'm Pub. Works Committee	J. Price, City Engineer, Council House, Birmingham	do.
Pipes, etc.	Chepping Wycombe Council	T. J. Rushbrooke, Boro' Survey., 77, Easton-st., High Wycombe	do.
Annual Contracts	Penge U.D.C.	Surveyor, Town Hall, Anerley, S.E.	do.
Macadam	Brighouse Corporation	S. S. Haywood, Borough Engineer, Brighouse	do.
Extension, etc., of Boiler House, Kirkstall-road Baths	Leeds Corporation	City Surveyor's Office, Leeds	do.
Reconstruct. of Two Tenem'ts, Queen's-pl., Greenside	Edinburgh Corporation	Borough Engineer, Police-chambers, Edinburgh	do.
Paint. Fish-house Stores, etc., at Newhaven Harbour	Leith Harbour Commissioners	P. Whyte, Superintendent, Docks Offices, Leith	do.
Road Materials	Wetherby R.D.C.	Mr. Wiseman, Surveyor to the Council, Wetherby	do.
Two Cabmen's Shelters, Hull	Hackney Carriage Committ. of Corp.	J. H. Hirst, City Architect, Town Hall, Hull	do.
Pipes, Sluices, and Hydrants, and Laying same	Wellington (Salop) U.D.C.	G. Riley, Surveyor, 45, Walker-street, Wellington, Salop	do.
Road Metal	Durham County Council	County Surveyor's Office, Shire Hall, Durham	do.
Cartage, etc., for Auckland & Chester Main Rd. Dist.	do.	do.	do.
Greenhouse, etc., East Park, Holderness-road	Hull Corporation	J. H. Hirst, City Architect, Town Hall, Hull	do.
Stores, Gas Department	Birmingham Corporation	G. H. Barber, City Gas Offices, Council House, Birmingham	Mar. 10
Mechanics' Institute, Lecture Hall, etc., Cambois	.....	T. Tulip, Architect, Whinney-hill, Choppington	do.
High Voltage Fittings	Manchester Electricity Committee	F. E. Hughes, Electricity Department, Town Hall, Manchester	do.
5,000 yards of 1-in. Feeder Cable	Manchester Electricity Department.	do.	do.
Stores and Materials	Carlisle Corporation	H. C. Marks, City Engineer, 36, Fisher-street, Carlisle	do.
Regula. Ch'b'r on M'n Sewer, Br'dl'y Hurst, Dukinfield	Stalyb'dge & Dukinfield Jt. Sew. Bd.	J. P. Wilkinson, C.E., 301, Cathedral-street, Manchester	do.
Making-up Mentone & other Roads, Parkstone, Poole	Poole Town Council	J. Elford, Borough Surveyor, Poole, Dorset	do.
Sewer in Mentone-road	do.	do.	do.
Making-up Woodside-road	do.	do.	do.
*Making-up Roads	Ealing Town Council	Borough Engineer, Town Hall, Ealing, W.	do.
*Annual Contracts	M.B. of Hackney	Borough Engineer, Town Hall, Hackney, S.E.	do.
Electrical Plant, Belfast	Gas and Electric Committee	V. A. H. M'Cowen, City Electrical Engineer, Belfast	Mar. 11
Supplies	East Ham U.D.C.	C. E. Wilson, Clerk, Town Hall, East Ham, E.	do.
Two Semi-Detached Cottages at Fairwater, nr. Cardiff	.....	W. Beddoe Rees, A.R.I.B.A., 37, St. Mary-street, Cardiff	do.
Altera. to Farm Steading, Blackhillock, Burgie Estate	.....	C. Doig, Architect, Elgin	do.
Cottages at Dandaleish	.....	J. Smith, Seafield Estates Offices, Rother, N.B.	do.
125 lin. yds. Dwarf W'll, etc. Lewish'm-pk. Dartm'h-rd	Smethwick Corporation	C. J. Fox Allin, Borough Surveyor, Town Hall, Smethwick	Mar. 12
732 lineal yards of Iron Fencing, Lewisham-park	do.	do.	do.
Lavatories at Public Buildings, Smethwick	do.	do.	do.
Materials	Coventry Works Committee	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry	do.
Electricity Works	Loughborough Corporation	C. H. Gadsby, Engineer, 20, Victoria-street, Westminster, S.W.	do.
Pipe Sewer, Bury New-road	Heywood Corporation	J. Ainsworth Settle, Borough Engineer, Heywood, Lancs.	do.
Stores	Gravesend Electricity Committee	C. F. McInnes, Electricity Engineer, Electricity Works, Gravesend	do.
Twenty-seven Dwelling Houses, Bedwas, Mon.	Trustees of Building	G. L. Watkins, Architect, Station-terrace, Caerphilly	do.
Slag	Stafford R.D.C.	W. Morgan, Clerk, 4, Martin-street, Stafford	do.
Trial Borehole at Pumping-Station at Tweedmouth	Berwick-on-Tweed San. Authority	R. Dickinson, Burgh Surveyor, Berwick-upon-Tweed	do.
Stores	Eccles Borough Council	C. W. Laskey, Town Hall, Eccles	do.
Materials and Stores	do.	G. W. Willis, Sewage Works, Eccles	do.
Main Road and Bridges, etc.	Okehampton R.D.C.	S. Hooper, District Surveyor, Biddicombe, Hatherleigh	do.
Improvement of Lane, Hannah-street	do.	Surveyor's Office, Pentre	do.
Conversion of Bank Buildings, Pentre, into Offices	do.	do.	do.
Electricity Works near Gas Works, Tiverton	Town Council	J. Siddalls, Borough Engineer, Town Hall, Tiverton	do.
Fifty-five Houses at Blackwood	Osborne Building Club No. 2	James & Morgan, Architects, Charles-street-chambers, Cardiff	do.
Street Sewers	Ardrossan Town Council	C. J. Shaw, Burgh Surveyor, Ardrossan	do.
400 Tons of Irish Square Setts	Belfast Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast	Mar. 14
Materials	Eastbourne Town Council	D. J. Bowe, Borough Surveyor, Town Hall, Eastbourne	do.
Carting, and for Tools and Oil	Lichfield R.D.C.	C. O. Rawstron, District Surveyor, Lichfield	do.
Granite	do.	do.	do.
Temporary Pavilion for National Eisteddfod at Rhyl	.....	Darbyshire & Smith, Architects, 17, Brazennose-street, Manchester	do.
Works and Supplies (Various Departments)	Edinburgh Corporation	Burgh Engineer, Police-chambers, Edinburgh	do.
Two Water-Tube Boilers, etc.	Aston Manor Corporation	T. J. Ballard, Electricity Works, Chester-street, Aston Manor	do.
Whinstone, Granite, and Gravel	Sculcoates R.D.C.	A. Greaves, Surveyor, Hessle	do.
Conveniences in Parks, etc.	Sheffield Corporation	C. F. Wike, City Surveyor, Town Hall, Sheffield	do.
Sewerage and Sewage Disposal Works	Shepley & Shelley Jt. Sewerage Board	T. A. Murray, C.E., Independent-buildings, Fargate, Sheffield	do.
Steam Turbine Generator	Stepney Borough Council	A. Wright, Electricity Engineer, 27, Osborn-st., Whitechapel, E.	do.
Boilers, etc.	do.	do.	do.
Whinstone, Limestone, Slag	Chester-le-Street R.D.C.	G. W. Ayton, Highway Surveyor's Office, Chester-le-Street	do.
Cartage of Materials	do.	do.	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Assembly Hall, Buncrana	.....	E. J. Tove, Architect, 20, St. James-street, Londonderry	Mar. 14
Converter House, Cable, Culverts, etc., North-road	Brighton Corporation	F. J. Tillstone, Town Clerk, Town Hall, Brighton	do.
Jobbing Repairs to Workhouse and Parochial Bdgs.	Liverpool Select Vestry	H. J. Hagger, Parish Offices, Brownlow-hill, Liverpool	do.
Intercepting Sewers, Whitewick	Renfrew County Council	W. R. Copland, C.E., 146, West Regent-street, Glasgow	do.
Street Works	Paisley Town Council	Burgh Surveyor, 13, Gilmour-street, Paisley	do.
*Making-up Causton-road (First Section)	Borough of Hornsey	Borough Engineer, Municipal Offices, Southwood-lane, Highgate, N.	do.
*Electricity Works	Brighton Boro' Council	Town Clerk, Town Hall, Brighton	do.
Materials	St. Helen's Corporation	G. J. C. Broom, Borough Engineer, Town Hall, St. Helen's	Mar. 15
Annual Contracts	Sutton Coldfield Corporation	W. A. H. Clarry, Borough Eng., Council House, Sutton Coldfield	do.
Pipe-Laying and Tank	New Mill U.D.C.	C. H. Marriott, Son, & Shaw, Engs., Church-st.-chams. Dewsbury	do.
Covered Br'k, etc., Reservoir, nr. L'gridge, Linlithgow	Bathgate District Committee	P. C. Hart, C.E., 134, St. Vincent-street, Glasgow	do.
Two Calorifiers at Baths and Washhouses, Laurie-grove	Deptford Borough Council	The Engineer at the Baths, Laurie-grove, New Cross	do.
Pavilion at Isolation Hospital, Mousehole	Southampton Corporation	J. A. Crowther, Borough Engineer, Municipal Offices, Southampton	do.
Materials and Jobbing Work	Ipswich Sanitary Authority	E. Buckham, Borough Surveyor, Town Hall, Ipswich	do.
Additions to Hotel, Burtonport	.....	E. J. Toye, Architect, 20, St. James-street, Londonderry	do.
*Making-up Roads	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham, N.	do.
*Making-up and Construction of Roads	Henley-on-Thames Corporation	R. Pratt, Town Hall, Henley-on-Thames	do.
*Sewerage Works	City of Westminster	Works Dept., Westminster City Hall, Charing-cross-road, W.C.	do.
Alternating Current Transformers	Wallasey U.D.C.	J. A. Crowther, Engineer, Seaview-road, Liscard	Mar. 16
Alterations, etc., Old Boar's Head Inn, Long-street	Middleton Corporation	W. Welburn, Borough Surveyor, Town Hall, Middleton, Lancs.	do.
Road Material and Cartage	Tutbury R.D.C.	H. S. Tebbitt, Surveyor, 320, Shobnall-street, Burton-on-Trent	do.
Road Material	Uckfield U.D.C.	F. Holman, Clerk, 86, High-street, Lewes	do.
Materials, etc.	Hampton U.D.C.	S. H. Chambers, Surveyor, Public Offices, Hampton, Middlesex	do.
Cemetery Chapel, Ho., etc., Shepley-rd., Hooley Hill	Andenshaw U.D.C.	T. George & Son, Architects, Stamford-street, Ashton-under-Lyne	do.
Roadways on Kennell Estate, near Bo'ness	.....	Mr. Macpherson, Architect, 7, Young-street, Edinburgh	do.
Blasting Works	Dis. Com. of Mid. Wd., Co. of Lanark	J. B. Ferguson, District Offices, Hamilton	do.
Building a Training Ship for 650	Metropolitan Asylums Board	T. D. Mann, Clerk, The Embankment, London, E.C.	Mar. 17
Additions to St. Nicholas' Church, Dundalk	.....	W. H. Byrne & Son, Architects, 20, Suffolk-street, Dublin	do.
Electric Supply Plant, etc., Derry Lunatic Asylum	Committee of Management	R. V. Macrory, Engineer, Strand, Londonderry	do.
Heating New Buildings at Gransha, Derry Asylum	do.	M. A. Robinson, C.E., Richmond-street, Londonderry	do.
Wrought-Iron Tubes and Lead and Compo Pipes	Rhondda U.D.C.	O. Thomas, Engr., Gas and Water Offices, Pentre, R.S.O., Glam.	do.
Stores	do.	do.	do.
Iron and Steel Lightship	Commissioners of Irish Lights	O. Armstrong, Secretary, Irish Lights Office, Dublin	do.
*New Sorting Office, Finsbury Park	Commissioners of H.M. Works, etc.	J. Wager, H.M. Office of Works, Storey's-gate, S. W.	do.
†Tools and Stores	Burma Railway Company	A. G. Begbie, 76, Gresham House, Old Broad-street, E.C.	Mar. 18
Materials, etc.	Moss Side U.D.C.	D. Ainley, Council Offices, Moss Side, Manchester	do.
Warehouse, Station-road, Weston-super-Mare	Lalonde Bros. & Parham	H. Price & W. Jane, Architects, Waterloo-pl., Weston-super-Mare	do.
*Signal Station, etc., Alderney, Channel Islands	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
*New Coastguard Buildings, Sea View	do.	do.	do.
Sewage Purification Works (Contract No. 3)	Harrogate Corporation	E. W. Dixon, Engineer, 5, Prospect-crescent, Harrogate	Mar. 19
Annual Contracts	Hoylake U.D.C.	T. Foster, Surveyor, District Council Offices, Hoylake	do.
Materials	Highways Committee, Burnley	C. H. Pickles, Borough Surveyor, Town Hall, Burnley	do.
Road, Duffryn Crawnon Valley	Road Committee	T. Rees, M.Inst.C.E., Corn Exchange-chambers, Newport, Mon.	do.
Road Materials	Rothwell U.D.C.	J. T. Pears, Surveyor, Council Offices, Rothwell, near Leeds	do.
House and Shop, etc., New Tredegar	.....	G. Kentshole, Architect, Station-road, Bargoed	do.
Carnegie Free Library	Portadown U.D.C.	W. Wilson, Town Clerk, Town Hall, Portadown	Mar. 21
Two Pavilions, West Heath Infectious Diseases Hos.	King's Norton & Northfield U.D.C.	A. W. Cross, Engineer, 23, Valentine-road, King's Heath	do.
Boiler, etc.	do.	do.	do.
B'kwater and other Wks., at Cape Clear, County Cork	Office of Public Works	H. Williams, Office of Public Works, Dublin	do.
Halifax-road Sewer	Todmorden Sanitary Committee	Borough Surveyor's Drawing Office, Market Ground, Todmorden	Mar. 22
Road Material	Mutford R.D.C.	S. Bloy, Surveyor's Office, Oulton Broad, Lowestoft	do.
Underground Lavatory for Women, Piccadilly	Manchester Corporation	City Surveyor, Town Hall, Manchester	Mar. 23
†Underground Lavatory for Men, Piccadilly	do.	do.	do.
Grange Vale and Borough-road Sewer	Birkenhead Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead	do.
*Casual Wards at Workhouse, Victoria Park, N.E.	Bethnal Green Guardians	W. A. Finch, 76, Finsbury-pavement, E.C.	do.
Convent at Kilfinane, co. Limerick	Committee of St. Paul's Convent	B. E. F. Sheehy, Architect, 57, George-street, Limerick	Mar. 25
*New Coastguard Buildings, near Plymouth	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
*Additions to Asylum at Garlands	Cumberland, etc., Joint Asy. Com.	C. W. Allan Hodgson, The Courts, Carlisle	Mar. 26
Refuse Destructor, Newbold-road, Rugby	Rugby U.D.C.	D. G. Macdonald, Engineer and Surveyor, Rugby	Mar. 28
Annual Contracts	Little Hulton U.D.C.	J. H. Heyes, Clerk, Council Offices, Little Hulton	do.
Sanitary Towers & Wards, Union Workh., Tranmere	Birkenhead Guardians	E. Kirby, F.R.I.B.A., 5, Cook-street, Liverpool	do.
Sewerage and Sewage Disposal Works, Bawtry	Doncaster R.D.C.	D. Balfour & Son, Engs., 3, St. Nicholas-bldgs., Newc'stle-on-Tyne	Mar. 30
*Sewerage and Sewage Disposal Works	Chailey R.D.C.	Powell & Co., Estate Offices, Lewes	Mar. 31
Materials (Stone)	Hemsworth R.D.C.	T. H. Richardson, Surveyor, Hemsworth, near Wakefield	No Date
Buildings, Senghenith	Industrial Co-operative Society	G. L. Watkins, Architect, Station-terrace, Caerphilly	do.
Pulling Down & Rebuild. White Ox Hotel, Blackwell	Dirs., Carlisle Old Brewery Co., Ltd.	J. F. H. Harriman, Architect, 26, Castle-street, Carlisle	do.
†Rebuilding Premises in Castle-street, Carlisle	.....	H. J. Martindale, Architect, Viaduct-chambers, Carlisle	do.
Pair of Houses, Faustin Hill Estate, Wetheral	.....	do.	do.
Fifteen Houses, Hoyland Common	.....	W. J. Taylor, Architect, 38, Bank-street, Sheffield	do.
Drill Hall, 36 ft. by 65 ft.	.....	Captain Holliday, Lunnclough Hall, Huddersfield	do.
Residence, Allerton	.....	F. Holland, Eng. & Arch., 11, Parkinson's-ch., Hustlerg., Bradford	do.
Boilers & Pipe Cover., Storthes Hall Asyl., Kirkburton	.....	J. Vickers Edwards, County Architect, Wakefield	do.
School, Wheatley-hill	Wingate School Board	J. Garry, F.R.I.B.A., 33, Grainger-street West, Newcastle-on-Tyne	do.
Warehouse, Wade-street, Leeds	.....	Messrs. Mosley, Rent Collectors, 6, Wormald-row, Leeds	do.
Three Houses, Mansfield-road	.....	R. Lambert, Mansfield-road, Oak-lane, Bradford	do.
Boarding-house and Shops, Jamestown, Inverkeithing	.....	T. M'Grath's, 63, Main-st., Lumphinnans, Cowdenheath, Fifeshire	do.
Buildings of the *Dundee Courier*	.....	Niven & Wigglesworth, Architects, 104, High Holborn, London	do.
*Founda. & Basem't, New Prudential-bdgs., Brighton	.....	Paul Waterhouse, 20, New Cavendish-street, W.	do.
Two 12 ft. Purifiers, with Valves	Royston Gas Co.	H. Ellison, Cleckheaton	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions.* *Contracts*, iv. vi. viii. x. *Public Appointments*, xviii.

TENDERS—*Continued from page 267.*

PRESTON.—For erecting a two-story transit shed at Albert Edward Dock, for the Corporation. Mr. James Barron, Engineer, Ribble Navigation Offices, Preston:—
Thos. Croft & Sons, Victoria-street, Preston £19,785

RATHDOWN (Ireland).—For the erection of cottages, for the Rathdown Rural District Council No. 1. Messrs. Doolin, Butler, & Donnelly, architects, Dawson-chambers, 12, Dawson-street, Dublin:—

Single Cottages.

District.	Masonry. No.	£ s.	Brickwork. £ s. d.	Concrete. £ s.
	1. 160	0	160 0 0	155 0
Stillorgan only	2. 187	0	—	—
Reilly's field only‡....	3. 142	0	150 0 0	138 0
	4. 197	0	—	—
Rathmichael and Stillorgan	5. 180	0	180 0 0	160 0
	6. Nil.			
Dundrum only	7. 166	0	170 0 0	—
	8. Nil.			
	9. Nil.			
All the Glencullen and single at Kilternan 5 pairs, 2 singles§ ..	10. 143	0	150 14 6	142 0
	11. Nil.			
	12. 165	0	191 10 0	165 0
Ballally	13. Nil.			

‡ O'Carroll Bros., Main-street, Bray.*
§ J. P. Macken, 44, Mountjoy-square.*

Pairs of Cottages (semi-detached).

District.	Masonry. No.	£ s.	Brickwork. £ s.	Concrete. £ s.
	1. 350	0	350 0	340 0
McCana's field only..	2. 364	0	—	—
Reilly's field only‡ ..	3. 260	0	270 0	246 0
	4. 380	0	—	—
Rathmichael and Stillorgan only§.....	5. 324	0	324 0	290 0
	6. 357	0	379 0	335 0
	7. 316	0	324 0	—
Glencullen¶	10. 268	0	274 0	271 10
	11. 375	15	400 15	361 10
Ballally only	13. 352	0	—	—

‡ O'Carroll Bros., Bray.*
§ Geo. Bower, Ballybrack.*
‖ Wm. McCabe, Sandford-road, Ranelagh.*
¶ Jos. Macken, Mountjoy-square, Dublin.*

Dundrum Cottages (two story) built in a range.

	Masonry. No.	£ s. d.	Brickwork. £ s. d.	Concrete. £ s. d.
	1. 1,210	0 0	1,200 0 0	1,180 0 0
	2. 1,640	0 0	—	—
J. Clarke, Upper Clanbrassel-st.*	6. 1,198	0 0	1,198 0 0	1,117 15 0
	5. 1,240	0 0	1,272 0 0	—
	8. 1,500	0 0	1,506 0 0	1,408 0 0
	9. 1,320	0 0	1,320 0 0	—
	11. 1,450	0 0	1,450 0 0	1,500 0 0
	12. 1,178	8 4	1,273 0 4	1,146 18 4

Repairs to Golden Ball Cottages.
O'Carroll Bros., Bray* ..... £68 per cottage.

REIGATE.—For revolving sprinklers, penstocks, valves, etc., for sewage-disposal works at Earlswood, for the Council:—

J. H. Dale £2,770	10	F. Bird & Co. ..	2,514 9
Whittaker & Co., Ltd.	2,611 6	W. Weeks & Son, Ltd., Maidstone*	2,396 4
Willcocks & Son	2,576 0		

SALISBURY.—For erecting new dining-room, classrooms, and dormitories at the Hostel, Barnard's Cross, for the Committee of the Salisbury Diocesan Training College. Messrs. John Harding & Son, architects, 58, High-street, Salisbury:—

Harris Bros.....	£2,968 15	Vincent & Foland*	£2,800 0
Wort & Way ..	2,875 0	P. Tryhorn & Son	2,795 0

[All of Salisbury.]

SHEFFIELD.—For a steel girder bridge with stone abutments and pier, over the River Don, at Weedon-street, Brightside, for the Improvement Committee, Sheffield. Mr. C. F. Wike, City Surveyor, Town Hall Sheffield:—
William Craig, 5, John Dalton-street, Manchester* £10,457 9 7

SHILDON.—For sewage disposal works, Shildon, Durham, for Shildon and East Thickley Urban District Council. Mr. C. Heslop, Surveyor, Council Offices, Shildon, Durham:—

J. Moore.....	£4,213	W. & J. Lant	£3,275
G. T. Manners	3,678	B. Firth & Co., Holgate-road, York*	3,044
A. Metcalf	3,466		

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SOUTHAMPTON.—For additions to the offices at the Corporation Wharf, Chapel, for the Corporation. Mr. J. A. Crowther, Borough Engineer :—

H. Stevens & Co.	£340 0 0	F. Grace	£295 0 0
F. Osman	317 0 0	J. Nichol	280 0 0
T. H. Stiles	299 19 0	W. Jupe*	244 14 6
H. Lawrence	297 10 0		

[All of Southampton.]

STRADBROKE (Suffolk).—For the erection of a police station, for the East Suffolk County Council. Mr. H. Miller, County Surveyor, 16, Museum-street, Ipswich. Quantities by the architect :—

Linzell	£1,222	Plummer	£1,049
Skuffham	1,220	Bullen	1,039
Gladwell	1,174	Cubitt & Gotts	1,020
McKay	1,155	Chandler & Etheridge	984
Thurman	1,147	Butcher & Rumsey, Stradbroke*	970
Doe	1,100		
Boddy & Son	1,095		
Burgoyne	1,051		

SWINDON.—For various street works, for the Corporation. Mr. H. J. Hamp, Borough Surveyor, Town Hall, Swindon. Quantities by Borough Surveyor :—

Landsdown-road to Kent-road.

F. Street	£147 3 0	Free & Sons	100 17 9
W. B. Winchcombe	£106 16 6	Free Bros., Marlborough*	98 4 9

[Borough Surveyor's estimate, £96. 0s. 3d.]

Poulton-street to Back-road, from Poulton-street to Cricklade-road.

F. Street	£139 11 10	W. B. Winchcombe	£96 18 6
Free & Sons	120 2 10	G. Whitehead, Swindon*	77 17 6
Free Bros.	100 12 8		

[Borough Surveyor's estimate, £92. 1s. 7d.]

Poulton-street to Florence-street.

F. Street	£113 14 2	W. B. Winchcombe	£79 8 6
Free & Sons	107 3 9	G. Whitehead, Swindon*	64 12 3
Free Bros.	81 15 0		

[Borough Surveyor's estimate, £78. 3s. 4d.]

Poulton-street to Suffolk-street.

Free & Sons	£72 10 1	Free Bros.	£55 19 8
F. Street	72 6 8	G. Whitehead, Swindon*	45 13 6
W. B. Winchcombe	58 10 3		

[Borough Surveyor's estimate, £53. 7s. 6d.]

Suffolk-street to Florence-street.

Free & Sons	£74 9 6	Free Bros.	£57 6 0
F. Street	74 6 8	G. Whitehead, Swindon*	46 12 3
W. B. Winchcombe	59 14 9		

[Borough Surveyor's estimate, £54. 6s. 1d.]

Poulton-street to Handel-street.

Free & Sons	£81 15 9	Free Bros.	£62 6 0
F. Street	80 15 6	G. Whitehead, Swindon*	50 9 6
W. B. Winchcombe	64 16 9		

[Borough Surveyor's estimate, £59. 1s. 6d.]

Handel-street to Cricklade-road.

F. Street	£82 8 5	Free Bros.	£61 17 8
Free & Sons	81 4 7	G. Whitehead, Swindon*	49 8 4
W. B. Winchcombe	62 0 3		

Borough Surveyor's estimate, £57. 3s. 0d.]

Between Poulton-street and Florence-street.

F. Street	£76 16 6	W. B. Winchcombe	£54 6 6
Free & Sons	72 12 5	G. Whitehead, Swindon*	43 3 4
Free Bros.	57 1 4		

[Borough Surveyor's estimate, £52. 11s. 4d.]

SWINDON.—For the electric wiring of Euclid-street higher elementary school, for the Corporation. Mr. J. G. Griffin, electrical engineer, Electricity Works, Swindon :—
F. Webb & Sons, Leicester* £173 15 0

WARRINGTON.—For a cast-iron tank and small reservoir, Longford Depot, for the Sanitary Works Committee. Mr. James Deas, engineer :—

For Cast Iron Tank.
J. Melbourne, Ltd., Warrington* .. £419 17 4

For Small Reservoir.
H. Fairclough, Builder & Contractor, Warrington* £485 0 0

WALMER.—For the erection of dwelling house at Hawkshill, for Mr. F. W. Leith. Messrs. Fry & Miller, architects, Cannon-street, Dover :—

May & Davis	£729 0 0	G. H. Denne & Son	624 0 0
J. W. Sandcraft	655 0 0	A. W. Thompson	614 0 0
J. J. Wise	652 0 0	J. E. Turner, Walmer*	546 0 0
S. & R. Jefford	647 13 0		
T. T. Denne	643 0 0		
Hayward & Son	624 10 0		

[Architects' estimate, £620].

WALTON-ON-THE-NAZE.—For making-up, paving, and metalling Green-lanes, Suffolk-street, West-street, and lower section of The Parade, for the Urban District Council. Mr. H. W. Gladwell, Surveyor, High-street, Walton-on-the-Naze. Quantities by the Surveyor :—

E. West	£2,633 0 0	W. Adams	£2,381 14 7
Starkey	2,573 18 3	Fairweather	2,380 12 0
Potter	2,525 13 7	Harvey Bros.	2,316 2 9
Burgoyne	2,482 6 11	J. C. Trueman, Swanley*	2,112 0 0
Griffith & Co.	2,409 0 0		

[Surveyor's estimate, £2,271. 7s.]

WALTON-ON-THE-NAZE.—For the construction of a burr groyne, Sea Defence Works, The Parade, for the Urban District Council. Mr. H. W. Gladwell, District Surveyor, High-street, Walton-on-the-Naze. Quantities by the Surveyor :—

T. W. Pedrette	£697 0 0	E. West	£342 0 0
Burgoyne	607 2 6	T. Adams	329 0 0
Cox Sea Defence Co.	504 17 6	J. C. Trueman, Swanley, Kent*	279 0 0
J. Fairweather	375 12 0		

[Surveyor's estimate, £345.]

WEMBLEY.—For constructing about 90 lineal yards of 9 in. stoneware pipe sewer, Blind-lane, for the Urban District Council. Mr. C. R. W. Chapman, Surveyor, Public Offices, Wembley, N.W. :—

W. Barrick	£311 0 0	H. Haynes	£136 12 7
T. Free & Sons	282 3 4	Wm. Cox, jun.	130 7 8
Wm. Pavey	277 5 10	A. B. Champnis	119 17 2
George Bean	161 16 8		

WORKINGTON.—For erection of new class and cloak rooms, etc., to St. Michael's Schools, for the Education Committee of the Borough of Workington. Mr. A. H. Coyle, architect, 10, John-street, Adelphi, London, W.C. Quantities by architect :—
R. Douglas, Workington* (Parts I. and II) £1,402
[Tenders for portions of work were received from twenty others.]

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The Builder.

VOL. LXXXVI.—No. 3188. MARCH 12, 1904.

ILLUSTRATIONS.

New Buildings for the University of Cambridge ..... Mr. T. G. Jackson, R.A., Architect.
Hollington House, Berks ..... Mr. A. C. Blomfield, F.R.I.B.A., Architect.
Gallery and Ballroom ..... Messrs. Clark and Moscrop, Architects.
Design for a Town House ..... By Mr. E. W. Allfrey.

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Some Considerations on the Reform of the Easement of Light.

As many of our readers know, a Committee of the Institute for a long time considered the question of a reform of the easement of light, and issued a Report on the subject, which formed the basis of the Bill introduced last session. Whether or not a similar Bill or one differing from the Bill of last session be again introduced this year is a matter of no importance, for, having regard to the political situation, it certainly cannot, apart from its merits, be passed into law. It appears, however, to be important that the question of the easement of light should be considered from some points of view which are apt to be neglected. It is often said, and with a great deal of truth, that the present power of the owner of the dominant tenement is arbitrary, hard on owners of servient tenements, and has a tendency to prevent the erection of desirable buildings. But it seems to be forgotten that this state of the law leading to these results was deliberately brought into force by the Legislature and by the action of Lord Grey's Government in 1834, and that this state of the law has existed for the best part of a century, whilst from a still earlier time than 1834 the same principles as now flourish were in a limited state of existence. Thus there have grown up an immense number of valuable rights, and we all know from the licensing question how hardly fought for are rights of even a much more precarious kind.

Again, not only do these rights exist, but there also exists a generally accruing right of property in ancient lights. In an old and conservative country such as England the alteration or the diminution of such rights is one of the most difficult things to undertake and to carry through. Such an undertaking can never be successful in any other hands than those of the Government of the day, and the Government of the day, the moment it brings in a measure to benefit one set of proprietors, must be prepared to encounter the hostility of another set. These remarks may seem somewhat in the nature of truisms, but unless they are properly appreciated the difficulty of reforms and changes in the law of light cannot be understood. Many improvements are theoretically desirable and are easy of achievement on paper, but prejudices and hostile interests crop up and are powerful the moment such changes are brought forward in actual life. It is equally useless to point to the example of the United States or of any other country. Details of our constitution, innumerable matters in the social life of the people, differ from those of other countries, but that fact does not give any impetus towards their change. It appears, therefore, to be clear that reforms in the easement of light cannot be successful unless based on the broad ground of public interest, or unless they are introduced to remedy a clear and undoubted injustice. It is on this latter ground that we have insisted over and over again that the chief reform required is some modification of that part of the law of light which touches the vindication of the right, and which refers to the question of damages and injunctions.

Here we have an example of actual injustice. Let us assume the propriety of the right of the owner of a dominant tenement to light; but the moment that right enables a man to get more than justice a resulting injustice to another man comes into being. If A, the owner of the dominant tenement, has a right infringed by the heightening of a servient building, which infringement can be properly compensated by damages, then when such right is used, either to prevent any raising at all of a servient building or to exact an unreasonable sum, this right leads to injustice. We get beyond the mere vindication of a right, and the latter becomes a positive means of doing wrong. If that state of things can be shown to result from the law of light as it is to-day, as it certainly can, then we have no doubt that sooner or later some modifications will be made in it. But the point to be arrived at is to demonstrate this state of things to the people generally and to the Legislature in particular, and we are convinced that the best way of attaining this object would be by the appointment of a Royal Commission to consider the law of light. The deliberations of the Institute have hitherto had no practical result, and they will not have until Parliament can be convinced by the result of an impartial investigation that changes in the law of light are urgent—urgent and not merely desirable.

We have referred to the fact that injustice must be shown as one ground of change; the general public welfare is another ground. It has to be noted

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that the basis of the old customs of London and York which were abrogated by the Prescription Act of 1834 was the general welfare. By these customs an old servient building could be raised on the same foundations so as to obscure a dominant building's lights. And why? Because the increase of large, important, and roomy edifices was necessary for the well-being of London. The interests of the owner of the dominant tenement were regarded as secondary to those of the town as a whole. True, the fact that the servient owner was limited in his rights soon became irreconcilable with the progress of society, but nevertheless there was in existence the principle that the public benefit was above the interest of the private individual. So that what we have to look for at the present time are the points in connexion with the law of light and with its practical working where the public advantage requires a modification of the rights of the dominant owner, not for the benefit primarily of the servient owner, but of the community. Investigation by a thoroughly competent and impartial tribunal would, we think, show that such circumstances exist. For example, there may be two small and unimportant dwelling-houses near each other, one having ancient lights. Let us assume that the other is sold for the purpose of forming part of the ground for a large general shop, advantageous to the neighbourhood, necessary for its reasonable development. Can it be right that the owner of the small dominant tenement should be able to prevent the erection of a building required in the interests of the local community? If a railway had to be made right through the dominant building, the company, under its legislative powers, could demolish it on payment of reasonable compensation. The railway company is invested with these powers because it is for the public benefit that private rights should be put on one side in some circumstances. We are not now working this matter out in detail. We give this example only to illustrate a principle. No such power as we here indicate could be bestowed on a servient owner until the circumstances of each case had been investigated. But there are reasons for the belief that such circumstances may be found to exist, and that the present difficulties may in some instances be capable of solution by the application to rights of light of the principles and practice of compensation as in the case of statutory undertakings.

No greater mistake can, however, be made than to think that any change in the easement of light is easy, for the reason that any change will conflict with actual and with inchoate rights, which are prized and which have a certain pecuniary value. But the fact that the late Lord Cairns succeeded in passing a measure which modified the strictness of the law by allowing in some cases damages to be given instead of the issuing of injunctions shows that by tact, firmness, and knowledge further reforms are possible. But we have little doubt that for them it will be necessary to await the advent of a new administration and of a new Lord Chancellor anxious to make his mark on the municipal law of England

FIRE PROTECTION FOR THEATRE STAGES.

ONE of the most beneficial resolutions of the outgoing London County Council was the adoption of its Theatre Committee's recommendations to compel theatre managers to use non-inflammable scenery, including thereby all wings, sky borders, cloths, draperies, gauzes, floral decorations, and properties. The resolution was to the effect that the premises licensed for public entertainments should only obtain their licence upon complying with these requirements, and the requirement distinctly states that the scenery shall be rendered and *maintained* "non-inflammable."

It may be recollected how strongly we have advocated this, only recently again in connexion with the lamentable catastrophe at Chicago. At last our great local authority has awoke to the fact, so long argued by our leading specialists, that to obtain fire protection one must, in the first instance, adopt fire-preventive measures, and that it is almost useless to legislate on questions of construction and fire-extinguishing apparatus to meet the occurrence of fire and panic until the possibility of this actual occurrence of fire and panic has been minimised.

In the case of all theatres—whether equipped with an old-fashioned or with a modern stage—the primary risk is nowadays to be found in the highly inflammable nature of the scenery and properties. Experience has long proved that the high inflammability of scenery is the one great source of danger, and, more, that this was the source of danger that could be more easily restricted than, for instance, the actual possible cause of an outbreak to be found, say, in the sparking or fusing of the electric light installation or some actor's neglect with a burning cigar or open light.

It is now to be hoped that the County Council will soon go one step further and compel theatre managers to substitute wire cables for the highly-inflammable rope, and compel all new theatres to have modern stages of metallic construction and hardwood stage floors, fly floors, and gridiron floors.

Turning to the question of the non-inflammability of scenery, we observe with some anxiety that the County Council has not defined the word "non-inflammable." If we bear in mind the various chemical solutions that are advertised in theatrical papers as making scenery fire-resisting, one must be dismayed at the idea of the possibility of a theatre manager being allowed to apply some of these at his own goodwill and discretion and in his own way, without having a minimum standard fixed as to what degree of "non-inflammability" is required and what constitutes "non-inflammability." On the Continent of Europe the non-inflammability of scenery had been ordered in certain localities as far back as 1882; but these foreign rules, however excellent on paper, fell in abeyance owing to the technical difficulty of rendering the scenery "non-inflammable" in such a manner that the "non-inflammability" was real, and that it was maintained in a practical manner for more than a nominal period. The wondrous solutions that were sold at the time were, to a considerable extent, preparations which, to all intents and purposes, ensnared the managers and the public officials into a feeling of safety, while the ordinary danger had, as a matter of fact, been scarcely, if at all, reduced.

Of all the various methods of treating the canvas of scenery—and we have studied them most carefully—we only know of two in the United States, one in South Germany, and one in Great Britain that meet practical requirements; whilst as far as the "non-inflammability" of wood is concerned, we only know of one method in Great Britain and one in the United States that are reliable, and these are both based on complete impregnation, followed by a process of slow and systematic artificial drying.

No one can be more averse than we are to the principle of legislation creating a kind of monopoly over some proprietary article, and yet it must be remembered that some of the great inventions of the world have necessarily resulted in such monopolies having been temporarily created, even for a period of some years. Take, for instance, the early monopoly of the incandescent electric light. But, nevertheless, we think that the County Council will have to define its term "inflammable" in such a way that a real safeguard may be assured, even if, as we hold, there is only one firm in the United Kingdom that can meet a logical specification, and that it will take at least a year or two for any other firm or firms to arrive at the same standard of proficiency in the execution of their work to compete against the existing firm, even in regard to that part of its process which we consider to be of common knowledge, *i.e.*, not subject to exclusive patent rights. The demand for "non-inflammable" processes will necessarily lead to the subject being taken up by many firms and by chemists, and competition will ensue, even if those first in the field get the start they deserve for their pioneer work.

But a specification, we think, we should have, and this specification is important, alike for the wood contained in the scenery, properties, and fittings as it is for the canvas employed. For wood it is essential that the impregnation should be absolute and thorough. Timber deemed "non-inflammable" should be impregnated to such an extent that any splinter or chip taken from the kernel or interior of any scantling used should show the same non-inflammability as that taken from the exterior. It is also important, to our minds, that the "non-inflammability" should be of the character known by chemists as "flame-proof," viz., that the wood should neither catch fire, sustain or spread fire or flame, and that at the very most the slight red dark glow should be permissible—viz., the glow of incandescence as distinct from flaming. To be a practical and commercial commodity, and to avoid the opposition of the ordinary stage carpenter, stage hand, and scenic painter, it is essential that the wood should take paint; that when complete and dry it should not corrode screws or nails; and that the chemicals in the impregnation should in

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no way be of a poisonous character that might affect the throats of employees. These are all points that should be borne in mind.

Regarding the non-inflammability of canvas, here the treatment must preclude any thread of the canvas or any frayed edge of the canvas catching, sustaining, or spreading fire or flame. The canvas after treatment must take paint easily. The treated canvas must not corrode the tacks used for nailing it on or affect the thread used for stitching. The chemicals used, as before indicated, must not be of a poisonous character.

During the transitional stage it will, of course, be necessary to discriminate between existing scenery and new scenery. It will be practically impossible and economically unpractical to insist on all the wood framing of existing scenery being taken out and replaced by impregnated wood. Similarly the application of chemicals to existing scenery will have to be very carefully and systematically done, so as to avoid damaging the scenery. With new scenery it will, of course, be plain sailing, as impregnated wood (duly stamped or marked), and canvas that has been impregnated prior to being made up for scenery, should alone be permissible. For gauzes, draperies, hangings, etc., much care and experience will be necessary to avoid injury to the texture and to the colour. In our experience practically every colour and every texture requires a different treatment, and velvets and satins are particularly difficult to manipulate. Altogether, whilst congratulating the Council on its new rule, we foresee that administrative difficulties can only, in the first instance, be overcome by clearly defining what is "non-inflammable" for existing scenery and what is "non-inflammable" for new scenery, with sub-definitions as to the standards for new canvas and new timber.

We must now turn to the construction of the stage, its metallic supports, its modern mechanism, and its wire work, which replaces the rope work of old. America and the Continent have now been rapidly adopting such stages in all new theatres, and they have also been introducing them in some of their old ones. The reason for this is, mainly, a saving on the weekly labour sheets for stage hands and on the insurance premium against fire risk and economy in the repairs list; or, in other words, their economical advantages generally. With us these metallic stages are still very much the exception, and the Royal Opera House, Covent Garden, alone has a complete mechanical installation with electrically-driven bridges. Their introduction into the new playhouses has, however, now become a necessity as a safeguard for the public, and, as on the Continent, they should be made compulsory. We do not see the least disadvantage, financial or otherwise, in such compulsion to the management. In fact, it will soon be found that, as abroad, there is an economical advantage in their introduction.

One other point in connexion with the protection of the stage against fire. We refer to the apparatus to be applied when the fire has broken out. In the first instance, we have the fire-resisting curtain and the louvres over the stage. Regarding the former, after much consideration, we would in new theatres henceforth substitute the metallic fire-resisting curtain in place of the one now commonly in use and made of asbestos cloth, the quality of which material is at times very problematical. As to the louvres, they should open automatically with the closing of the fire-resisting curtain.

Next we have the extinguishing apparatus, and we hold that the automatic sprinkler has become an essential, no matter what safeguards are taken for the exclusion of combustible scenery and the combustible stage. It is, of course, to be hoped that the sprinkler will never have to come into action, owing to the non-inflammability of the stage and its equipment, but the sprinkler would certainly be a second line of defence. Given, in addition to this, the ordinary hydrant hand-pump and bucket equipment, the safeguards of the stage should be complete.

In conclusion, we may take the opportunity of pointing out to the provincial authorities the great advantage of immediate imitation, which will be the less difficult now, having regard to the fact that the London scenery which will henceforth be taken on tour to the provinces will be non-inflammable, and the local manager will thus be limited to simply making his local pantomime a non-inflammable production. Birmingham has been the first in the field in making "non-inflammable" scenery compulsory by a resolution of the magistrates, which was arrived at last week. But there are yet at least some fifty provincial authorities that should immediately follow suit.

OLD PEWTER.

THE Exhibition of Old Pewter at Clifford's Inn, which will remain open till the 26th of the present month, is one of peculiar interest in regard to the fact that it shows what can be done by design to give value to articles executed in a material not in itself rich or costly. The English public, with their love of gold and silver, their habit of estimating decorative work by its bullion value and not by its artistic merit, may, or might, find a wholesome lesson here, in the study of a collection of work which is full of artistic and picturesque interest, though executed in a material of little intrinsic value, a mere alloy of tin and lead.

Artists there are, no doubt, who will maintain that pewter is far superior metal to silver for artistic work; but that is an exaggeration born of a recent fashion for pewter collecting. A great deal of the work at Clifford's Inn would look still more attractive if executed in silver. In certain ways, however, pewter has qualities of its own for artistic work which are different from those of silver. The dulled surface lustre has its special effect, and also the heavier outline and proportion arising from the greater thickness in which the metal is used and its very ductile quality give a character, especially to large and boldly-modelled objects, which silver cannot so well bestow. We see this at Clifford's Inn in such examples as the massive "large flagon or measure" on the top of case B, with its wide double roll in the middle; an object which would look rather clumsy in silver, but which in pewter seems expressive of, even suggested by, the quality of the material.

Among objects which show the value merely of good form in a cheap material and with hardly any ornament, are some of the plain old English tavern pots and measures shown on the second shelf of dresser A. Nothing could be simpler than these, but they are all moulded into an outline which, in itself, gives them a certain style and distinction. So also in wall-case B the shapes of the various beakers exhibited, with their slight moulding at the base, and the upper portion spreading to the top in a delicate concave curve, are in themselves examples of style; the style which comes from perfect suitability of shape. Some of them show engraved ornament of a delicate type, and which in no way interferes with the outline; but without this they would still be pleasing and artistic objects.

Of the degree of refinement, however, with which so homely a material as pewter may be treated, there are remarkable examples in the collection, which show how a cheap material may be raised almost to the condition of a kind of jewellery. Among these are the curiously-shaped Chinese tea-caddies and spice-boxes in wall-case A, with their delicate engraved diaper ornament; and —perhaps a still more remarkable example—a cup and cover of Malay work, which was on one of the dressers (on the north side of the room), but of which there seems to be no mention in the catalogue. This is covered with a very slightly relieved ornament, of which the leading lines are formed by a kind of miniature form of strap-work, something like Elizabethan detail on a very minute scale, with a filling of smaller ornament between. But English work shows in some cases a minute delicacy and finish which we are used to associate rather with silversmiths' work; as in the very pretty set of "six liqueur glasses" (so-called in the catalogue, though they are entirely pewter), with well-designed stems, and a bowl ornamented with a band and base of very minute hatching. This is very simple, yet the result is refined enough for any table.

Among the classes of objects illustrated candlesticks are tolerably numerous, and wall-case A contains examples of many types, including some very good French ones of exactly the same class as we frequently see in silver, and which, perhaps, are better suited to that material, and some English ones of peculiarly graceful line, one of them having almost the proportions and lines of a tall Venice glass. Dresser C contains two French altar candlesticks of a most sumptuous description, perhaps rather too much so for the material, for the employment of such large and exuberant ornament rather presupposes a valuable metal. Where pewter shows at its best, in short, is where the lines are pure and fine, not where the ornament is exuberant and bossy in character. Among the more refined objects, let the reader look, for

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instance, at the "two cinquefoil plates" in dresser B, late XVIIIth century work; the design here is very unusual, and on the most delicate and refined lines; and it is noteworthy that in spite of their date, there is a touch of late mediæval feeling about them. In dresser E, again, is one catalogued as "a plate with ornamental rim," a plain octagonal plate with a small scalloped ornament round the edge, which is a model of good taste; and one next to it, which we cannot identify in the catalogue, with its variegated and waving outlines, is a perfectly beautiful bit of work, depending for its effect entirely on refinement of line.

There are curiosities also which interest one from their picturesque or unusual character, or their suggestiveness, apart from direct artistic beauty. How completely Teutonic in suggestion, for instance, are the "Two Guild-cups (German)" on the top of dresser D. How very German they are, with the armed men on the top and the general look of bluster about the whole design. Hexagonal food-bottles, of which there are several, are a form of article which has its peculiar historical interest; why should this hexagonal plan be thought specially suitable for food-bottles? The only one that we noticed was dated is of 1673. Among other curiosities are a very fine and interesting collection of spoons of various dates—the older type, with the bowl broad at the end and the thin handle with a capping to it, is the best to look at, but has the drawback that the handle is not shaped for convenience to the hand; the shape of the bowl is better in style than the modern shape, and might be revived.

There are many other things that might be mentioned. We can only advise all who are interested in decorative art to visit Clifford's Inn for themselves.

NOTES.

The Architectural Association Meetings. THE Architectural Association are considering the question of altering their night of meeting, one reason given being that members often want to go out of town from Friday afternoon to Monday morning—not necessarily on holiday, but that it is often a convenient part of the week for travelling to inspect work going on in the country. This hardly seems to us a sufficient reason for altering the day of the week of meeting (Friday) which has been adhered to, we believe, ever since the Association was founded; and in the interests of the Association we should advise them against making the change. Almost every important society has a fixed week-day for its meetings, and to alter the traditional arrangement without very strong cause is undesirable, and is likely to lead people to think that a society which does so is in an unsettled condition. We may also point out, as we give more space than any other journal to reporting the Association meetings, that if Monday (as proposed) be substituted for Friday as the evening of meeting, it will be difficult to give such full reports of the discussions as we are now able to give. If the Association wish to make any change as to the time of meeting, we counsel them rather to change the hour than the day. As we have before pointed out, 7.30 is an inconvenient hour and at variance with the practice of almost all large societies in London, the usual meeting hour being 8 o'clock. When the Association started as a small body of architectural assistants, an early hour (6.30 we think it then was) probably suited the convenience of the members best. When it developed into a large and influential society, as it now is, it was evidently felt that the original hour was unsuitable; but to put it at 7.30 was only a half-measure; it is neither one thing nor another; and, for the considerable number of older members whose habit is to dine before going to a meeting, it is exceedingly inconvenient, as it means an entire upsetting of their usual arrangements. We know that some members are often kept from the meetings who would otherwise attend them, in consequence of their being held at this abnormal hour.

Liabilities for Street Paving. YET another decision has to be noted on the subject of liability for street paving—Millard *v.* Balby with Hexthorpe Urban District Council. The Urban District Council had served notices on the owners of property abutting on a street which was not repairable by the inhabitants at large, calling upon them to pave, etc., the street, and as the notice was not complied with the Council did the work themselves, completing it in December, 1901. In March, 1902, the appellant, one of the owners, sold his premises. The apportionment of the cost of the work was served on the appellant under section 257 of the Public Health Act, 1875, in November, 1902, and the demand for payment of the sum was made in May, 1903. The appellant took the point that he was not liable since at the time the demand was made he had ceased to be the owner of the premises, and that this was essential in addition to ownership at the time the work was completed, and the Divisional Court has upheld this contention. From the case of Mayor of Hampstead *v.* Gaunt, which we noted in our issue of May 2, 1903, it would appear that the purchaser, by virtue of section 77 of the amending Act, may be rendered liable for these expenses whenever the work was done, as the time was from demand; but when the Bill is introduced consolidating the Public Health Acts this point requires consideration, since it is obviously very inequitable that the purchaser who buys a house which he sees abutting on a public road fully made up should subsequently find himself rendered liable for the paving expenses which have been incurred long before. In Gaunt's case ten years had elapsed before the demand was made.

Automatic Railway Couplings. IN a letter to *The Times* of Monday last Mr. Richard Bell points out that the number of fatal and serious accidents to railway shunters in the United States has been decreased from 11,710 in 1893 to about 1,800 in 1903. This result is undoubtedly attributable to the State enforcement of automatic couplings. On the other hand it is stated that during the same period the returns of British railways show an increase of 2,000 "coupling" accidents, causing loss of life or serious injury. Mr. Bell appears unwilling to believe that the backwardness of British railways with regard to automatic couplings can be due to our lack of inventive capacity or our want of humanity, and he expresses the very reasonable opinion that the nation should demand to know upon whom the responsibility rests—the Board of Trade, the railways, or inventors. We do not believe it is necessary to look far for the answer to this question. Numerous forms of automatic coupling are in existence which, if not absolutely perfect, are thoroughly practical and suitable for adoption. But the fact is that railway companies have a deep-rooted objection to novelties that are not absolutely forced upon them by the laws of the land, or the equally inexorable laws of competition. Railway companies are as reluctant to take up inventions as any Government department, and, although professing anxiety to adopt automatic couplings and other life-saving appliances, they do nothing and will continue to do nothing until compelled to act by the strong hand of the law. The stereotyped excuse is that no perfectly satisfactory coupling has yet been found. This is clearly nothing better than a subterfuge, for, even if British inventions were worthless, it would be easy to adopt, with any necessary modifications, the American type of coupling which has saved thousands of lives within the last few years. The matter is one demanding immediate action on the part of the Board of Trade, or the intervention of Parliament if the Board feels unable to cope with the powerful railway interest.

Concrete-Steel Factory Building. A VERY interesting example of concrete-steel construction is afforded by a factory building recently erected in Long Island City, New York. This was originally designed with brick walls and timber roof trusses of what is known as the "slow-burning" type, but it was afterwards decided to make the building fireproof throughout. It is worthy of note that the adoption of concrete-steel involved an expenditure of only 15 per cent. more than that of the original design, this excess being less than the additional cost of any efficient fireproof system. Another important point is that the change of design had the effect of reducing the estimated fire insurance premium to one-twentieth of the amount that would have been payable on the original design. A complete description of the methods followed in the construction of this building is given in the *Engineering Record* of January 16, and should be of interest to our readers. One of the most remarkable features in this building is the use of concrete-steel transverse roof girders of 50 ft. 2 in. clear span. These we believe to be the longest concrete-steel beams hitherto built, and they serve to emphasise the great possibilities of the new material which is now at the disposal of architects.

Electric Traction on Railways. A VERY suggestive paper was read this week by Mr. F. F. Bennett to the Institution of Electrical Engineers on "The Railway Electrification Problem and its

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Probable Cost for England and Wales." He began by pointing out that if the suburban railway system is to hold its own against municipal tramway competition the average speed must be accelerated and a more frequent service of trains provided. The electrification, therefore, of the suburban lines will soon become a necessity, and it is imperative that the systems used by the different companies be standardised. Mr. Bennett recommends the formation of a central directing board consisting of members appointed by the railway companies. Their duty would be to select a system of electrification and to divide up the country into sections, each of which would contain a central power station which would supply all the railway lines within its area. The cost of this scheme he works out for England and Wales, and estimates that after paying for interest and depreciation there would be a fraction of a per cent. left to increase the dividends of the various companies. This he rightly considers not a sufficient inducement to effect such a revolution in traction methods. He goes a step further, however, and suggests that by halving passenger fares and doubling the train miles by giving a more frequent service the alteration would lead to an increase of traffic of at least 300 per cent. The increased receipts and the improved "load factor" on the power stations would enable a substantial profit to be made in this case. As an experiment he suggests that the railways in the fifteen-mile radius round Manchester be electrically equipped. If the reduction of fares by a half resulted in trebling the traffic, then the electrification could be proceeded with rapidly. It is foolish of railway companies to act individually. A central body like the Railway Clearing House could easily control the working of the various power stations required. As an example of how British internal trade is handicapped by heavy railway rates, he mentions that the carriage of a ton of apples from Folkestone to London is *1l.* 4s. 1d., whilst the freight from California to London is only 15s. 8d. The carriage of a ton of eggs from Galway to London is more than four times the cost of the carriage from Russia to London.

The Olympic Theatre, Wych-street: 1804-1904.

AFTER varying fortunes, its last use being for the services of the St. Giles's, Little Wild-street, Mission, the Olympic Theatre is now being pulled down. Its predecessor had been built in 1849, after F. W. Bushill's designs, which were illustrated in the *Builder* of December 22-9 of that year, upon the site of the equestrian circus which Philip Astley began to build in 1804, and opened in September, 1806, as the Olympic Pavilion. Astley made his own designs and used the oaken timber and spars given to him by the King of *La Ville de Paris*, a prize man-of-war in which William IV. had served as a midshipman. Elliston took a lease of that house as the Little Drury-lane Theatre, which on March 29, 1849, was destroyed by fire. In 1889-90 Messrs. Holliday and Greenwood, who contracted for 21,577*l.*, rebuilt the theatre for Mr. Charles Wilmot upon an enlarged area of about 13,500 sq. ft. after Messrs. Crewe and Sprague's plans and designs, having a "mule-shoe" shaped auditorium for some 3,000 persons, a proscenium 34 ft. wide, and a stage 54 ft. deep; the stage being, it is said, second in size to only that of Drury-lane Theatre. Mr. Wilson Barrett, lessee, opened the new house on the night of December 4. Three years afterwards the same architects carried out some alterations, with redecoration, etc., of the house, for its conversion into the New Olympic Music Hall, under which name it was opened by a company on August 7, 1893, but in less than twelve months the property was offered for sale at auction under an order in Chancery. Then, in the summer of 1898, the New Italian Opera Syndicate was formed for giving lyrical performances there. In the winter of 1889-90 the owner of the lease agreed to sell to the London County Council for 12,000*l.*, and at a computed saving of 25,000*l.* to the Council (who had scheduled the site for their new street), his interest for an unexpired term of fifty-one years at a rent of 2,250*l.* per annum, Lord Craven being the ground landlord. For the more fortunate days of the Olympic, which stands, with Craven-buildings and Maypole-alley, on the site of Craven, formerly Drury, House, we must turn to the careers of Miss Foote (Countess of Harrington), Madame Vestris (who was lessee in 1832-9 and lived for a while in Craven-buildings), Mrs. Nisbett (Lady Boothby), Liston, and William Farren, and in a more recent time, of Charles Kean, Charles Mathews (who there made his first appearance on the stage), Robson, Horace and Alfred Wigan, and Benjamin Webster.

The Parish Church, Deptford.

A FUND has been opened for carrying out the restoration, at a computed outlay of some 1,400*l.*, of the tower of the parish church of St. Nicholas at Deptford. The old tower, from the level of the belfry-floor upwards, has been in a dangerous condition during some years, insomuch so that the ringing of the bells was discontinued, and the fabric suffered much damage from a gale on October 17, 1901. The church, which is situated between Deptford-green and the Stowage, was enlarged in 1630; sixty years afterwards the nave, aisles, and chancel were entirely rebuilt of red brick with stone dressings and angle quoigns, and have been repaired on two subsequent occasions. The Early English tower, which is constructed of stone, with buttresses at the corners, rises in three stages, and once formed a prominent landmark, due west from Greenwich Hospital, for the shipping on the Thames, and a church dedicated to the patron saint of sailors has stood in the old manor of West Greenwich or Depeford since, it is said, the XIIth century. Amongst the monuments are those erected in memory of two children of John Evelyn, who lived at the adjacent manor house of Sayes Court (demolished in 1728), of Captain Fenton, who went with Frobisher on two voyages, and of many naval commanders who fought against the Dutch, French, and Spaniards at sea. About nine years ago was removed from over the porch of the charnel-house in the churchyard, into the interior of the church, and protected by a glass case, a fine piece of carving in oak representing Ezekiel's Vision in the Valley of Dry Bones, and attributed to Grinling Gibbons.

The Goupil Gallery.

THE Spring Exhibition at the Goupil Gallery is not quite as good as usual; there is a lack of works of the first order, though there are a good many small works which have their own interest. M. Carrière's heads (1, 5), painted as if seen through a fog, represent a weak and affected style of art. Mr. Weiss exhibits a depressing and melancholy "February Floods" landscape (18), with a good deal of power about it, and close to it a little painting, "Sunny Morning" (19), a scene in a village, as bright as the other is gloomy. Mr. Robert Fowler's "Grey Day on Great Orme" is a fine, delicately-painted sea view with a cliff foreground. Delicacy of any kind is absent from Mr. Peppercorn's two small smudges—we can hardly call them paintings—"The Hayfield" and "Surrey Homestead" (32, 36). Trees in nature are not flat black masses. One of the best landscapes in the room is M. Weissenbruch's "Sunny Pastures" (28), an admirable composition. M. Le Sidaner has several works in the style of handling he has invented, two of which, "La Statue" (58) and "The Gateway" (60), are really fine works, and perhaps this artist will gradually get rid of what is exaggerated in his method and discover that he has some better capabilities than that of merely developing a mannerism. Mr. J. M. Swan's "Fortune and the Boy" (44) is the most important picture in the gallery, and should have been more centrally hung. Among small things are two interesting little landscapes by "Lépine," very carefully finished views at Charenton and Caen (57, 62), which look as if they were painted a good while ago; an "Open Sea" (54), by Dupré, which is not like sea, and a "Sea off Yarmouth" (68), by Mr. Montague Smyth, which is. There is a classic pastoral by M. Fantin-Latour (41), in his usual remarkable style—the Cupid figure is beautifully painted; some architectural subjects by Mr. A. G. Webster, which are too woolly in texture; some by Bosboom, not very interesting; and one or two by Mr. Brabazon, in which the indicated buildings are formless and out of perpendicular. Architecture is certainly not well treated in this exhibition.

An Exhibition of Pastels.

THE pastels by Mr. Alfred Hitchens at the Walker Art Gallery, in New Bond-street, consist principally of landscapes on a small scale—a kind of subject not the best adapted for pastel, since the artist in this case is limited by the tints he has at command, which cannot represent the infinite variety and modification of colour in nature. On a large scale variation and blending of colour can be obtained in pastel by cross-hatching with different colours, but on a small scale this can hardly be done, as the resulting texture would be too coarse. Consequently, in such a collection as this, we find that the success of the small landscapes depends very much on the degree in

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which they can be represented by the usual pastel palette—if one may borrow the term from brush-painting. Sunset effects are nearly always too strong when attempted on pastel, as we find here. In other examples, such as "The Thicket" (14), "A Welsh Path" (16), "A Welsh Road" (18), and others that might be named, where the tones of the landscape come within the scale of pastel, the effect is very successful. Still, we cannot regard pastel as a suitable medium for landscape; it is apt to be too mechanical. Some pastel portraits are also exhibited, of which one of a child (26) is very pleasing.

Mr. Reed's Drawings.

AT the Leicester Galleries is a collection of the *Punch* drawings of Mr. E. T. Reed, the author of the delightful series of the "animal world," some of the original drawings for which are included in the collection. Most of the remainder are political caricatures, very clever, but the interest of which is based on other than purely artistic qualities. There is something higher than this, however, in "Blind Travellers Gone Astray at a Ford" (23); and the "prehistoric peeps" show a remarkable imaginative power. It need hardly be observed that the whole series of subjects are characterised by a thorough mastery of line drawing.

Flower and Fruit Pictures.

MR. WALTER TYNDALE has on view at Messrs. Dowdeswell's Gallery a collection of water-colours almost entirely dealing with the representation of fruit and flower stalls, making a bright and fascinating display of colour. The idea is a new one, and the execution is very careful and conscientious. In most of them a little effect of composition is realised by the addition of figures or of a corner of building, in general very effectively, as in "A Greengrocer at Viterbo" (33), where the pile of flowers is flanked by a sloping buttress. Mr. Tyndale can also treat architectural subjects without the aid of the flowers, as he shows in the "Street in Old San Remo" (23) and the drawing of the staircase at "S. Pelegrino, Viterbo" (34). It is a very interesting and pretty exhibition.

The Torquay Competition.

IN reference to our Note last week *re* this competition Mr. Lanchester, who is the assessor, desires us to state that the condition in question was issued without his knowledge and despite his expressed opinion that he should be consulted in all such matters. On being notified of it, he at once stated that he could not regard a condition formulated at such a late stage as binding on competitors. It is his view that the course adopted was a most undesirable one, and that every allowance must be made for the unfortunate position in which competitors have been placed. We had no information at the time as to who was the assessor; had we known it was Mr. Lanchester, we should have felt convinced that he could not have sanctioned a course of action so unbusinesslike and so unfair to the competitors.

THE ARCHITECTURAL ASSOCIATION:

THE DAY OF THE FORTNIGHTLY MEETING.

A SPECIAL general meeting of this Association was held on Friday last week, at 7.15 p.m., in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., Mr. H. T. Hare, President, in the chair, the meeting having been called for the purpose of discussing whether Friday was the most suitable day of meeting.

The Chairman said they had met to consider the desirability of changing the day of meeting from Friday to some other day in the week. The matter had been mentioned a great many times in committee, and various members had brought the subject forward from time to time, but so far it had not been seriously considered. There were probably some reasons why Friday was not the best day of the week. The meetings always had been held on Friday, and from the point of view of tradition there was something to be said in favour of keeping to that day. If, however, there were practical reasons which would make some other day more suitable, tradition must not be allowed to stand in the way of change. One reason why some other day would be better was that Friday was a day when members who lived in the country, or members who liked to take a long week-end, could leave town so as to have a full week-end. Another reason was that a certain number of members were of the Jewish faith, and they could never attend Friday meetings. He was not aware that there were any reasons why some other day would not suit as well as Friday, but he should be glad to know the opinions of the members. The evening which had been suggested was Monday; it was felt that it would be well not to have the meeting in the middle of the week, and that it must be at the beginning or the end, for a meeting in the middle of the week broke into the week too much, and made it inconvenient for many men to attend. If there seemed to be a general opinion that a change was desirable, the Committee intended to take a general vote of the whole body of members when the voting-papers for the elections were sent out, and in that way they hoped to get the opinion of the members on the subject.

Mr. Walter Millard said he supposed Friday was fixed in the old days to suit the members then, but it did not follow that the Association was bound to that day except in the way of pure tradition. Friday must have suited somebody in the old days; the question was, Did it suit the members now? If it did not, then the only other suitable day was Monday, and, of course, not the Monday on which the Institute met. It was a matter for the members to think about.

Mr. J. Osborne Smith said that in matters of this kind he was conservative. He preferred Friday.

Mr. W. H. Seth-Smith said the Association was a progressive body, and they went with the times. Judging from the advertisements of the railway companies, the week-end was a popular institution, and there was no doubt that a good many men went away from town from Friday evening until Monday morning. Monday seemed a very good day for the meeting of the Association. Some of the members of the Association were also members of the Art Workers' Guild, and that body held its meetings on Friday, and it seemed undesirable for that reason also that the Association should continue to meet on that day.

Mr. F. J. Osborne Smith said that Monday was quite as inconvenient from the point of view of the week-end as Friday.

Mr. Arnold Mitchell said it was a fine thing to be able to extend the week-end as long as the last speaker apparently did. It seemed to him (the speaker) that the week-end argument was a strong one—and not from the holiday point of view only, but from the point of view of work. The members of the Association who had country work made an effort to visit their distant jobs on Saturday—he did it continually—and they tried to get away on Friday night so as to interfere less with the week's work, and in order to see those works which took more than one day to visit. He had clients in the country who preferred to meet him on Saturday, and in his own case that resulted in a minimum of interference to his weekly work. He was an uncompromising opponent of the change at first; it seemed revolutionary; but on reflection the change seemed to be a most desirable one, which would help the Association, and which would result in better attendances.

Mr. F. Lishman asked if the change from Friday to Monday would be agreeable to the Institute. The Association turned out the Institute Library once a fortnight, and it might be that the Institute would prefer that to be done each Monday, rather than alternate Mondays and Fridays.

The Chairman said that they had not yet ascertained the views of the Institute, but there was no reason to doubt that the Institute would be favourable. Of course, they would ascertain the Institute's views before they went further.

A vote was then taken of the members present, and the Chairman stated that there was a majority in favour of the change, but a good many members did not vote.

The Special Meeting then concluded.

The Ordinary General Meeting was then held.

The minutes and nominations having been read, the following gentlemen were elected members of the Association:—Messrs. J. F. Blakiston, Campden Hill, W.; E. H. Gandy, Canonbury; and J. W. Fair, Hyde Park.

New Premises Fund.

The Chairman announced the following further donations to the New Premises Fund:—*i.e.*, Messrs. Wm. Glover, 10*l.* 10s.; F. L. Pearson, 10*l.* 10s.; W. T. Walker, 5*l.* 5s.; H. V. Shebbeare, 2*l.* 2s.; and S. Box, 1*l.* 1s.

A vote of thanks having been accorded to the donors,

The Chairman said he should like to call the attention of members to the suggestion made at the beginning of the session—*i.e.*, that the general body of members should double the amount of their subscriptions for this session. That invitation had been responded to in a very gratifying manner, but there were still a great number of members who had not responded. He hoped the suggestion would be borne in mind, because the Association had to face a large expenditure in the equipment and cost of building new premises, and there was still a large deficit. He hoped that every member who could possibly afford to double his subscription would do so, for if that were done it would make a substantial addition to the fund.

Mr. D. G. Driver, Secretary, then announced the Fifth Spring Visit on March 19 to the Belgrave Hospital for Children, Clapham-road, by permission of Mr. H. Percy Adams, members to meet at the building at 2.30 p.m. A visit will afterwards be paid to the Bishop's House, Kennington Park.

Mr. Driver also proposed a vote of thanks to Mr. G. F. Bodley, R.A., for conducting a party of members over Holy Trinity Church, Kensington, on February 20; to Mr. Aston Webb, R.A., for allowing a party of members to visit the Royal College of Science, Kensington; and to Messrs. Peacock and Dowie for conducting the party over the works. The motion was agreed to.

Mr. H. Tanner, jun., Hon. Secretary, announced a Discussion Section meeting on March 16, when a paper will be read by Mr. P. L. Waterhouse on "Practice in the Colonies." He also announced a Camera and Cycling Club meeting on March 22—paper by Mr. F. R. Taylor on "The Excursions of the A.A. Camera and Cycling Club in 1903."

The House List.

The Chairman then read the House List for Session 1904-1905 as follows:—

President, Mr. E. Guy Dawber.*

Vice-Presidents, Messrs. Arthur T. Bolton and *J. S. Gibson.

Committee (ten to be elected).—Messrs. R. S. Balfour,* G. B. Carvill,* Walter Cave, F. C. Eden, Henry T. Hare,* Arthur Keen, F. Lishman, Arnold Mitchell,* John Murray,* D. B. Niven, W. A. Pite,* J. MacLaren Ross,* W. Howard Seth-Smith,* W. J. Tapper, A. Brumwell Thomas, A. Needham Wilson, and E. W. Wimperis.

Hon. Treasurer, Mr. Francis Hooper*; Hon. Secretaries, Messrs. Louis Ambler* and H. Tanner, jun.*; Hon. Librarian, Mr. W. A. S. Pettit; and Hon. Assistant Librarians, Messrs. Edwin Gunn and C. M. Crickmer.

The Chairman announced that any fresh names might be handed in for nomination at the meeting on April 22, but they must bear the signatures of two members.

Schools.

The following paper on "Schools" was then read by Mr. J. W. Simpson:—

* Against name represents member of the present Committee.

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"Education is on everybody's lips. Our great schools and colleges are in the middle of a revolution which, like most revolutions, means discontent with what we have and no clear idea of what we would have." Thus said James Anthony Froude, shortly before the passing of Mr. W. E. Forster's great measure of Elementary Education in 1870. Thirty-five years have passed since he addressed those words to the students at St. Andrew's; a system of elementary education has come into existence, the Act under which it is administered has been amended, reamended, and extended from time to time as necessity and experience have suggested; yet what Froude said in 1869 may be repeated with equal truth in 1904. Well! Better a very South America of revolution in education than stagnation; to me it argues no small strength of national character that we should have thrown down the structure reared with so many years of patient care, and be already at work with an equal enthusiasm upon a new fabric, of, as we hope, better design. For we, who are brought into contact with the new authorities created by the Education Act of 1902 know well that—setting aside the few fanatics who are engaged in trying to cut one another's doctrinal throats—enthusiasm there is.

The movement, you will observe, does not so much affect matters of elementary education whereof the principal lines are now pretty well established, as of the so-called secondary and higher instruction. We are, without doubt, about to witness, by reason of the Act of 1902, just such a development and organisation of advanced teaching, as may be seen to have taken place in primary teaching when the condition of the latter in this country now is compared with what existed in 1870.

English Schools Previous to 1870.—It is instructive to look back for a moment at the state of English schools previous to that date. Charles Lamb, whose death at fifty-nine was, it may be noted, about equi-distant from 1870 in point of time with the present date, writes in his "Recollections of Christ's Hospital":—"As a novice, I was soon after taken to see the dungeons. These were little square Bedlam cells, where a boy could just lie at his length upon straw and a blanket—a mattress, I think, was afterwards substituted—with a peep of light let in askance from a prison orifice at the top, barely enough to read by. Here the poor boy was locked in by himself all day, without sight of any but the porter who brought him his bread and water—who *might not speak to him*—or of the beadle, who came twice a week to call him out to receive his periodical chastisement."

Well, we are not like to be called on to provide dungeons in the plan of any modern school buildings we may have to prepare; and in other respects the difference between educational requirements then and now is hardly less striking.

Fiction, the pictured view, so to speak, of geometrically-defined history, has preserved for us the likeness of Dotheboys Hall and its principal, Mr. Wackford Squeers. "We go upon the practical mode of teaching, . . . the regular education system," remarked that amazing foster-parent. "C-l-e-a-n, clean, verb active, to make bright, to scour. W-i-n, win, d-e-r, der, winder, a casement. When the boy knows this out of book, he goes and does it." I do not desire to dwell upon the abuses of those times; I mention them merely as illustrative of the change in our educational morals, which renders what was possible then a matter of scarcely credible comment now. Perhaps, however, while deprecating the morality of Squeers we may recognise in his methods the germ of the technical instruction of to-day.

In your sketching expeditions through country districts you have no doubt come across, and perhaps passed as unworthy of attention, little single-story brick buildings of hideous design garnished with cement travesties of Gothic gables and windows. Over the doorway is the inscription "National School" or "British School." It is a safe wager that if you stop and question the first six architects cycling by on their quest of tit-bits to measure, no one of them will be able to interpret to you the signification of those legends. Yet it is from these buildings that the modern type of elementary school has been developed. They were erected by two societies, the "National Society," founded by Dr. Andrew Bell, and the "British and Foreign Society," by Joseph Lancaster. The first Lancasterian school was opened in 1798, the National Schools dating from somewhat earlier. They were at first mainly supported by private subscriptions, and the term "Charity School" grew to be a more or less invidious epithet of distinction from the richer "Grammar School."

William Cobbett, riding through Sussex in 1823, says:—"I got to Goudhurst to breakfast and as I heard that the Dean of Rochester was to preach a sermon in behalf of the National Schools, I stopped to hear him." Being disappointed in this, he remarks:—"This preaching for money to support the schools is a most curious affair altogether," as, indeed, from his account of it, it was. The money seems to have been distributed by the "Society for the Promotion of Christian Knowledge," upon which society, its treasurer, the parson, and the Methodist school-master, who "was reading to the children out of a tract-book and shaking the brimstone bag at them most furiously," he bestows unmeasured abuse as he rides away. Later on, in 1834, grants of public money were made in their support, and shortly after an Education Committee was formed in the Privy Council to administer these grants.

The Bell and Lancaster Elementary Schools were the first to be planned on a scientific basis of relation between the system of teaching and the building. The method was, shortly, as follows:—One master had the entire control of the school. The number of scholars was unlimited; Lancaster is reported to have said that he would not hesitate to place as many as 1,000 under a single master in one room, though it is not reported that he ever actually did so. The building consisted merely of one room, of oblong form, and of suitable size for the number it had to hold. The master's desk was upon a raised platform at one end, and the scholars sat facing him at long desks placed transversely to the long axis. On each side of the desks, and the whole length of the room, was an alley or gangway 5 ft. or 6 ft. wide. The floor was inclined from the master's desk to the further end, where the highest class was placed. The whole school was divided into small classes according to attainments, the feature of the system being that every class was taught by other scholars, who had themselves reached a slightly greater degree of proficiency than those they taught. These "monitors," as they were called, occupied the side gangways already referred to, and formed their little classes into semicircles for reading and so on. No special arrangements were insisted on as to lighting, the windows being generally at both ends and on one side. The system of monitors became discredited as matters advanced, and their place was taken, about 1826, by "pupil teachers," under the development of the methods of Mr. David Stow, of Glasgow. These "pupil teachers," I may perhaps mention, are drawn from the ranks of the scholars, as were the monitors; but, although themselves still under training, are professional teachers who have reached a definite age limit and passed a certain qualifying examination.

The school-house plan was modified under the "Stow" system, but the principle of immediate supervision by the master remained. The school-room was still the simple oblong plan, though as much as 28 ft. or 30 ft. in width. A very large stepped gallery occupied the end furthest from the door, capable of seating quite two-thirds of the pupils. This was used for collective lessons, and, the buildings being designed in most cases for use also as Sunday schools, was considered of great importance, not only for efficient supervision, but as being well suited to the purposes of religious instruction. A row of long desks was placed against each of the side walls, for writing lessons, and one or two separate class-rooms were provided at the end of the room opposite the gallery, each with its own gallery.

The "pupil teacher" system proved successful, and the plan, with minor modifications, remained pretty much on these lines until the Committee of Council on Education, mentioned above, began to organise matters about 1840 and onwards. In the early schools, you will observe, simultaneous teaching was the aim of the plan; now, as pupil teachers became fairly efficient they were found capable of instructing separate classes with advantage, though, being young, they required supervision at their work and the help of the master's authority. Therefore, note how the problem had varied its conditions. What was now wanted was a series of classes, all separately taught, yet all under one controlling eye. The Gallery and Lancaster plans, where the seats were placed at right angles to the long axis of the room, were no longer suitable. The reason for their compact grouping had disappeared, and they did not permit classes to be effectively isolated one from another. Accordingly, the seats, instead of being placed at right angles to the long axis, were now put parallel thereto, and some three rows deep of desks only used, so that a young teacher's voice might easily reach the scholars. As it was clearly inadvisable to have classes seated face to face, they were placed side by side; the rooms were reduced in width, leaving room only for the class to be called out in front of the desks and grouped around the teacher. Here, then, at last we have our old friend the long school-room, 18 ft. or so in width, having seats on one side only and cross-lighted.

The classes were generally separated by a curtain, and the room was very often an L or T in shape, so that the master could readily overlook all that was going on from the intersection of the arms. Although there was generally a class-room to each department, where a special class could be taken, there is no hint as yet of the class-room plan as now understood. This mention of "departments" reminds one that boys and girls were by this time generally separated instead of mixed, as in the older and smaller schools, where considerations of expense did not allow of both a master and mistress being engaged. This was, however, by no means universal. Such, then, was the type of elementary school-building which prevailed up to the time of the momentous Act of 1870, which established School Boards.

It may be noted, before leaving this part of my subject, that the schools up to this date open to the working classes and the masses of the labouring population were what were afterwards called "Voluntary" schools. That is, they were maintained by private effort, supplemented by Parliamentary grants. Of these, the "National" or Church Schools counted in 1869 upwards of 808,000 children, as against 217,000 Dissenting and 68,000 Roman Catholic scholars.

School Boards being now established, and the directions of Parliament being peremptory as to the provision of sufficient school accommodation, the building of elementary schools proceeded apace. Public interest in the arrangement and designing of such buildings received a great stimulus; the adoption of the dual desk, with its attendant facilities for placing the desks in four or five rows deep instead of only three, brought about greater compactness in the disposition of classes, and required a wider plan of school-room.

Prussian Schools.—Attention was directed to the various Continental schools, and their relative merits were compared with the type developed from the "pupil teacher" system of this country. It is impossible for me to dwell at any length on foreign educational methods; it will suffice for my purpose to state generally that those of Prussia were found to be at once fairly representative of those of Europe, and in a very high condition of efficiency. The conditions of entrance and study in these Prussian schools render necessary much greater isolation of the class than with us. A class-room, in fact, as has been well observed, encloses within its four walls a little school in itself. This implies, naturally, a highly-trained teacher in charge of the class, who is equal to maintaining discipline without the constant moral support of the head master. It is typical of our national methods that, while approving and accepting the type of plan thus evolved, we rejected the method of which it was the logical result. It seems to have been thought that if every class were taught in its own room, better and more rapid progress would be made by the scholars; at the same time it was desired to retain the greater economy of teaching power given by grouped classes. It is also typical of our national methods that, after a trial school had been built which was considered more or less a failure at the time, we gradually evolved a combined "class-room" and "pupil teacher" system of our own, which has proved very satisfactory. This trial school was built in 1872 by the London School Board in Jonson-street, Stepney, and marks a most important step in the development of our elementary school planning. It was erected from the designs of Mr. T. Roger Smith, and you are, no doubt, familiar with its lines from published descriptions and illustrations.

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The Prussian class-room plan, already alluded to, contained no hall for collective teaching and assembly, though an examination hall was frequently attached to a school, as often as not on the top floor, being used perhaps three or four times in a year for examinations or public functions. Mr. Roger Smith's plan, however, retained the assembly hall or large school-room of English tradition, and added class-rooms opening out from it on three sides. It was a remarkable plan, and has greatly influenced subsequent school development. And I venture to draw your attention to the fact that it was the outcome of competitive design.

Since then the class-room system has steadily gained in favour, and the corollary of additional trained teachers has been accepted as necessary. The assembly hall, after being abandoned for a considerable period as extravagant, during which time the long school-room was made to serve its purpose, has been reverted to. In short, the type of elementary school plan deduced from the Act of 1870 has been, with local variations, formulated for some time past on the lines with which we are all fairly well acquainted.

I have taken you at some little length through ancient history, because I wished to show you, as clearly as might be in the time at my disposal, the growth of the plan from the method of teaching. Too many of us take the schools we have to design as merely structures to be contrived to hold a certain number of desks disposed in a given way. Well, it may serve the purpose for the moment to accept the formula which others have worked out. It is, doubtless, economical of time and trouble, to collect plates from professional journals, and select what seems most appropriate—as a ready-made clothier reaches down the garment most nearly fitted to his customer—but, believe me, no new development, no original solution of the problem set you, can be obtained without a thorough study and knowledge of the conditions on which that problem is based.

The New Education Act.—Those of my audience who are acquainted with the new Education Act of 1902 will, perhaps, pardon me if, before proceeding further, I invite you to glance at the principal provisions it contains affecting our work as architects. The bill consists of four parts and four schedules. The first part constitutes the new Local Education Authorities, who, as you are all aware, supersede the old School Boards, and are endowed with wider-reaching powers and duties. The essential matter of part 2, from our standpoint, is contained in the opening words:—"(1) The local education authority shall consider the educational needs of their area, and take such steps as seem to them desirable, after consultation with the Board of Education, to supply or aid the supply of education other than elementary, and to promote the general co-ordination of all forms of education." It proceeds to deal with the concurrent powers of smaller boroughs and urban districts, the raising of rates, and the religious instruction bogey, with which matters I need not trouble you.

Part 3 confers upon the new authorities the powers and duties of the School Boards, which the Act abolishes, and proceeds to direct that they "shall also be responsible for and have the control of all secular instruction in public elementary schools not provided by them." It further requires them to "maintain and keep efficient all public elementary schools within their area which are necessary," deals with their management, the use of buildings out of school hours, endowments and grants, and contains a form of exorcism for spiritual troublers of the peace in elementary, as part 2 already has for higher, education. There is in section 7, sub-section (*d*) a direction as to the upkeep and repair of non-provided school houses which should, in the case of impecunious managers and a close-fisted authority, "breed," as Mrs. Lirriper put it, "fruitful hot-water for all parties." It is, however, a little bit of sugar for the surveyors rather than for us, and I pass it by. An interesting provision is that of sections 8 and 9, by which a local authority is bound to give three months' public notice of its intention to build a new school or substantially enlarge an existing one. During this period certain interested parties, or even "any ten ratepayers in the area," may appeal to the Board of Education and challenge the proposed school as unnecessary. Decision as to the validity of such a challenge rests with the Board f Education.

It would seem that this provision may very much hamper an education authority in its negotiations for a site. It is clear that the notice should be given at the very outset of the scheme, and before obtaining the approval of the Board of Education. Otherwise the latter might be required to arbitrate in a matter which they had already prejudged. Should the Board, after holding a local inquiry, be satisfied as to the propriety of the proposal, the Local Government Board has then to be applied to for their sanction to borrow money to acquire the site in question. By this time the ground may, at any rate in the owner's opinion, have greatly increased in value, or be no longer in the market. I cannot conceive of private negotiations being carried on effectively where so long a period must, and an indefinite time may, elapse before the transaction can be completeted. Of course there are compulsory powers to fall back on, but these do not furnish the most speedy nor the most economical means of acquiring property for public purposes. Some provisional means of ear-marking a site, pending the possible delays, would appear to be needed, such as a short lease with option to purchase in a given time and a forfeit for non-completion.

I mention this matter because pretty complete sketch plans and estimates will be required by an inspector holding such an inquiry under the Act. He is especially directed to inform himself on the question of economy of the rates, and the drawings would have to be prepared at an earlier period of the scheme than heretofore.

With the general sections of part 4 I need not trouble you, though you should note that section 22, sub-section (2) limits the age of elementary scholars to sixteen years. The four schedules, too, though interesting to all engaged in educational work, do not come within our ken to-night.

You will not, I trust, consider that this cursory and superficial comment on the Act exceeds the limits of the subject on which I have been bidden by your President to discourse to you. The Act is in itself, as I have shown, of primary importance to every architect engaged in designing schools, and it should be borne in mind that it is, for all that, but the corollary and completion of a round dozen of previous enactments still in existence. Some of these it varies slightly and others widely, but all require to be read and studied in conjunction with it if its full import is to be seized. As I have shown you, our present system of elementary education, and consequently of elementary school architecture, has been founded on the parent Act of 1870, and its subsequent emendations.

Rules for Elementary Schools.—The experience in school building requirements gained by that most efficient of Government Departments, now known to us as the Board of Education, was embodied by them in the admirable code of "Rules to be observed in the planning and fitting up of Elementary Schools." This code has been revised from time to time as occasion required, and is familiar to all of you who are engaged upon school design. Excellent as it is, this document is not free from the tendency of all official rules to stereotype plan and crystallise design. Left-hand lighting, a very good thing in its way where writing and ciphering lessons are to be carried on, has been elevated into a kind of fetish, whereas, for some forms of teaching, it is not essential. For the important blackboard demonstrations it is bad—the teacher, unless left-handed, having to work with his back to the light and his face in shadow. The arrangement, favoured by the department, of open air sanitary conveniences, dates from years ago. To oblige a wretched child, quitting a well-warmed class room, to traverse an open playground in rain or snow without even the shelter of a covered way is, in view of modern sanitary conditions, merely barbarous. All latrines should be properly covered in, protected from frost, and accessible dry-shod in all weathers. The rules as to heating and ventilation are hopelessly out of date, though I am bound to admit that the Board of Education exercise a wise tolerance as to their observance. I do not want to stir up strife, but it must be admitted that, whatever demerits it may have under other conditions, the "plenum" system can at least claim to have proved itself a success in elementary day schools.

If, however, I have little but praise for these Rules for Elementary Schools, which have been woven on a foundation of experience, and have become, so to speak, suppled and elastic by age and alteration, I am far from approving the issue by the Board of cut-and-dried rules for secondary school planning. It had been my intention to deal with these at some length this evening, for there are, in my judgment, many points which require reconsideration; but since this paper was written it has come to my knowledge that the whole matter is under revision. The Board, it appears, recognises that the question of secondary school planning is in a transitional condition; and as my desire is to assist, as far as lies in my power, a department for which I have a very real esteem, rather than to criticise for criticism's sake, I shall, with your permission, reserve any comments I may have to make on the subject until later on.

A further reason for postponing discussion is that, as I learn, the Board has recently appointed a new consulting Architect, Mr. Felix Clay, the author of an excellent book on secondary schools, and the matter will no doubt receive sympathetic treatment at his hands.

Yet I permit myself to utter a warning note as to issuing formal rules for planning buildings of which the actual use is not yet settled. For, although "Elementary School" is a term very clearly defined by Article 3 of the "Provisional Code," no definition of secondary education at present exists, so far as I am aware.

I would venture to suggest to the Board of Education that these Rules, both for elementary and secondary schools, should be withdrawn, at any rate for a time, until the effect upon elementary school planning has been observed, of the higher education buildings to be provided under section 2 of the 1902 Act. It is likely, I think, that the local authorities will be strongly desirous of economising in the direction of the lower grade schools with a view to balancing the expenditure on the necessarily more costly secondary buildings. This may possibly take the form of larger classes in the lower divisions, and we may even see a second swing of the pendulum towards the long school-room, combined with class rooms.

The "Rules," I would suggest, might be replaced by a carefully-written short treatise upon the actual methods of teaching, illustrating the work of classes in the different standards and their especial requirements. It should be written by an architect and a head master in collaboration, and be accompanied by sketch-plans of typical buildings, which should be clearly indicated as being suggestions only and not as embodying the considered views of the Board. A new edition revised up to date should be issued every year. Further, I would like the Board to consider school buildings as erected by authority of the Secretary of State, and exempt them from the operation of the, in many cases, obsolete and absurd local by-laws. The Board has absolute and complete control of the design of the buildings and their construction; and, when once they have signified their approval, the buildings should not be liable to the ignorant interference of petty subordinate authorities.

[*To be concluded in our next.*]

CARPENTERS' HALL LECTURES:

THE FORESTRY PROBLEM IN THE UNITED KINGDOM.

THE second of the present series of free lectures on matters connected with building, arranged by the Worshipful Company of Carpenters, was given in the Hall of the Company on the 25th ult., when Professor W. Schlich, C.I.E., Ph.D., delivered an interesting lecture on "The Forestry Problem in the United Kingdom," illustrated by lantern views.

The Earl of Harrowby took the chair, and, in introducing the lecturer, said the question was a very serious one on national grounds alone, and gratitude was due to the Carpenters' Company for having taken up the matter. He thought the Government might follow the example of the German Government in starting forestry schools all over the United Kingdom. In regard to private owners, they found a difficulty in getting efficient woodmen to look after estates.

Professor Schlich divided his address into two parts—(1) the importance of the forestry problem to the nation, and (2) the measures which should be taken to ensure the benefits offered by forestry. Under the first head he spoke of the æsthetic effect of forests, the effect of forests on climate, upon the stability of the

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soil, and the produce of forests. As to the supply of timber, the home production probably did not exceed 2 million tons. Over and above that we import rather more than 10 million tons, so that only 16 per cent. of all the necessary timber is produced in the country. The increase in the annual imports between the years 1864 and 1899 amounted to 6¾ million tons, equal to an average annual increase of 190,000 tons. Of this timber, 87 per cent. are pine and fir, 3 per cent. are oak, and 10 per cent. are teak, mahogany, and other furniture woods. Hence, 90 per cent., or 9 million tons, was material which could be produced in this country by the afforestation of 6 or 7 million acres of land. The timber imported in 1899 came from the following countries:—From Canada, 1,897,000 tons; other British possessions, 318,000 tons; Russia, 2,242,000 tons; Sweden, 2,396,000 tons; Norway, 863,000 tons; France, 825,000 tons; Germany, 403,000 tons; the United States, 992,000 tons; other foreign countries, 168,000 tons. For these imports we paid to British possessions 6,687,000*l.*; to foreign countries, 18,990,000*l.*

The 90 per cent. of timber which could be grown in this country represented a value of 20,623,000*l.* But this was not all. Consider what industries, using wood as their raw material, might not spring up, if the timber were produced at home. In 1902 we imported 525,000 tons of wood pulp, for which we paid 2,398,215*l.* Surely, if we could grow anything, we could grow timber fit for wood pulp! If these and other items were added up, we found that we now paid for imports of timber, etc., the sum of 27 million pounds, all of which could be produced in this country.

As to the uncertainty of future supplies, most European countries imported, and only a few exported timber. If we drew the balance for the whole of Europe, we found an annual deficiency of 2,620,000 tons. For a good many years past Europe had not been able to supply, from within its own limits, the timber required by the several nations. And the deficiency was increasing. Norway was already working her forests with a heavy deficit by cutting more than grew annually, and this had been known for some time past. Sweden was hitherto considered solvent in this respect, but official information lately supplied by our representative at Stockholm, and published in a Parliamentary paper, showed that, according to the statements of the Swedish officials, the forests of that country were now being worked with an annual deficit of 106 million cubic ft. Of the Austria-Hungarian exports very little came to this country, because half of it went to Germany and the rest to various other countries. The exports from Roumania were very small and did not affect the question under consideration. There remained, then, Russia with Finland. That country had enormous areas of forest, but it had far greater areas without it. Moreover, a large proportion of the so-called forest area did not produce timber fit for export. Russia's population and industries were rapidly increasing. Different views were taken of Russia's capabilities to maintain her export of timber. His personal opinion, having weighed the evidence on both sides, was that Russia was a doubtful factor. At any rate, the authorities had already taken measures to restrict the working of the forests, for fear that, some time hence, the available out-turn of the forests might fall short of the requirements of home consumption. On the whole there could be no doubt that the pressure in Europe was increasing and was likely to do so in the future. This was indicated by the course which the average price of timber had followed. From about 1870 to 1888 the price of timber fell, chiefly owing to the great development of the means of transport by sea; from 1888 to 1894 prices were steady, but in the latter year a gradual rise set in, which in 1899 amounted to 18 per cent. The South African War brought some disturbance, but in 1902 a further advance occurred, so that the total rise during the eight years 1894 to 1902 came to 20 per cent. There could be no doubt that we should never again see the low prices of ten to fifteen years ago, because the more accessible forests in European exporting countries had been heavily worked, if not exhausted, so that the timber for export had, year by year, to be carried over longer distances before it reached the sea.

As to the non-European countries, the only exporting countries of importance were the United States of America and Canada. The total net exports very nearly balanced the net imports of European countries. Australasia had as yet large stores of timber, which consisted, however, chiefly of hardwoods. A certain quantity of it was exported, but she imported so much pine and fir that a balance was shown against her. The United States were working with a heavy deficit as compared with production, so that they had, in steadily increasing quantities, to draw on Canada. The gravity of the position had been recognised, and great efforts were being made to guard against a future timber famine in that country. Instruction in forestry was being given at three universities and some forty other educational establishments; State forests were being created at a rapid rate, and even private forest lands were brought under systematic forest management. Canada had as yet great stores in its 266 million acres of real timber lands, especially of coniferous timber. If the authorities in these self-governing colonies could be induced to introduce systematic management into the more important forests, that country might for ever supply the rest of the world with the necessary coniferous timber. Some mild efforts had been made by the Governments, and even forestry societies started, but the interests of the lumber trade were very great and powerful, and in the meantime the destruction of the forests by reckless cutting and fires went on. On the whole, then, the following conclusions seem justified: (1) We require enormous and ever-increasing quantities of timber; (2) Prices are likely to be higher in the future than they were in the past; (3) Supplies from outside rest on a very unsafe basis; (4) An increase of the woodlands in this country, if brought about by the afforestation of surplus lands, will keep a large amount of money in the country, and lead to an increased demand for labour in the establishment and management of such woodlands, and it is likely to cause the development of additional industries which use wood as their raw material.

As to the measures to be taken in the United Kingdom, 63 per cent. of the land of the United Kingdom was used for crops and grass, 4 per cent. were woodlands, 20 per cent. mountain and heath land, and 13 per cent. other lands. The latter included, in the case of Ireland, 1,124,111 acres of turf bog and 428,662 acres of marsh. The area of woodlands, 4 per cent. of the total area, was smaller than that of any other European country except Portugal. Again, only some 67,000 acres, equal to 2¼ per cent. of the British woodlands, belonged to the State, or rather the Crown, a percentage which was smaller than in the case of any other state. In France the percentage was 12, in Norway 12, in Sweden 27, in Austria-Hungary 12, in Germany 33, and in Russia 61. Considering all these matters, he believed he was justified in saying that an effort must be made to increase the area under timber in this country. Even apart from the 9¾ million acres of so-called other lands, about which it was difficult to obtain detailed information, we had over 15 million acres of mountain and heath land to select from. A large proportion of these lands were used for light grazing and as shooting grounds, but he was satisfied that their average rental value was not more than a shilling an acre. Even the best of them rarely gave more than half-a-crown, while there were millions in Scotland and Ireland which gave only a few pence a year per acre, or nothing at all. It was easy to show that a large proportion of these lands could be made more remunerative than they were at present, even allowing compound interest, at a reasonable rate, on all outlay.

It was sometimes said that home-grown timber was of a quality inferior to that of the timber now imported from abroad. This was, to a very large extent, a fallacy. The late Forestry Committee had abundant evidence that we could, and did, produce timber of a quality at least equal to that imported in the case of oak, ash, and larch. As regards Scotch pine and spruce, frequently an inferior quality had been produced, because the trees were given too much growing space, and in consequence laid on too broad annual rings. Proper sylviculture could remedy this. On the other hand, the imported timber of nearly all species came to us in pieces which were larger, straighter, and more free of knots than the ordinary home-grown timber. This was again due to faulty sylviculture in our own woodlands. Too heavy thinnings and too much growing space to the individual tree while young accounted for this. If we treated our forests as forests were treated on the Continent, we should produce just as fine timber, for our climate was admirably suited for it. What we required were improved sylvicultural methods, and the late Forestry Committee pleaded, in the first instance, for improved instruction in forestry. He was happy to say that this recommendation had already borne fruit. A special forestry branch had just been added to the Royal Agricultural College at Cirencester; a similar branch was about to be added to the Kent and Sussex Agricultural College at Wye—both for the instruction of landed proprietors or their sons, or young men preparing for the position of estate managers. A forest school for woodmen had just been started by the Commissioners of Woods in the Forest of Dean. Instruction in forestry had for a series of years been given at the University of Edinburgh, and there was every prospect of that branch being considerably enlarged.

Not all the 15 million acres of mountain and heath lands were suitable for successful afforestation, but he thought he was justified in saying that notless than one-third, and probably a good deal more, was suitable to be put under timber. Assuming that such land yielded all round an annual rental of half-a-crown an acre, its value, at thirty-two years' purchase, might be placed at 4*l.* an acre. "Supposing we plant, say, 1,000 acres with either larch, ash, Scotch pine, spruce, or oak, let us see what the financial results are likely to be in each case. Here we must, of course, start with certain data, and these I have collected with the greatest care from actual results, but keeping always on the safe side, so as to introduce into the amount the *minima* of returns which may be expected. . . . It will be found that a proprietor will get compound interest on his outlay at the following rates:—In the case of larch, 4¾ per cent.; ash, 4¼ per cent.; Scotch pine, 3½ per cent.; spruce, 3¼ per cent.; oak, 2¾ per cent. If the land costs more than 4*l.* an acre the proprietor will get less than the above-mentioned percentages. Let us say the land costs 6*l.* an acre, then he will get:—In the case of larch, 4½ per cent.; ash, 4 per cent.; Scotch pine, 3¼ per cent.; spruce, 3 per cent.; oak, rather more than 2½ per cent. As land of the class here under consideration is not likely to cost more than 6*l.*, it is clear that it will pay to grow timber on it. In many cases the land can be obtained for less than 4*l.*, when the percentages will be higher than those first mentioned. This will hold good in the case of mountain and heath land in Ireland, and frequently also in Scotland."

There remained, however, one great difficulty, and that was that the bulk of the surplus lands was private property. In some cases the proprietors were not inclined to plant, and in others they were hard up, and could not afford to meet the initial expense of planting or forego the present small income from the land until the plantations commenced to yield a return. The question thus arose, What could be done to overcome the difficulty? There were various ways of meeting the case:—(1) The State might encourage afforestation by private proprietors, by providing the means of education in rational, economic forestry, and by making advances at a low rate of interest to proprietors who are short of cash; (2) The State might acquire surplus lands and afforest them; (3) Municipalities might acquire surplus lands and convert them into communal or corporation forests.

All three agencies ought to be put into motion, but as matters were we must look chiefly to the first one. It seemed to him of the utmost importance that arrangements should be made to give advances to landed proprietors, who were willing to plant but unable to meet the initial expenses, at the rate of interest at which Government could borrow, plus a suitable addition by way of a sinking fund.

From time to time suitable tracts of land come into the market, and there was, in his opinion, no reason why the State should not acquire such land. On the whole, cases of that kind were comparatively rare in England, but probably more numerous in Scotland. In Ireland, however, the State could do something substantial in connection with the carrying into effect the latest Irish Land Act. Many of the estates, especially in the so-called congested districts, contained large areas of waste land which were not required by the new proprietors. Such areas might be acquired by the State and converted into State forests. The price of such land would probably be less than 1*l.* an acre.

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In reference to municipalities as proprietors, he maintained that afforestation offered one of the means of solving the unemployed question. The bulk of forest work could be done at those times of the year when the question of the unemployed was most pressing, and why should not this great city, even the Carpenters' Company, buy a few tracts of mountain land, where forest work could be given to the unemployed during winter? It was true that extensive tracts of surplus land could not be found in the immediate vicinity of London, but railway communication was so complete that a moderate distance did not make much difference. In the case of Surrey, Kent, and Sussex, out of the 36,502 acres of mountain and heath land a few thousand acres might be acquired. On this area he should start planting on a small scale under an efficient superintendent, so as to train a small establishment to the work. The men so trained would subsequently act as foremen. When pressure came in winter-time in London, the unemployed would be sent to the estate and employed in preparing the land for planting, by draining, fencing, and digging planting holes, on such a scale that sufficient work was provided for the men until hard times passed and they could return to their ordinary occupation, a certain number perhaps being retained to do the actual planting. Towards spring the staff of workmen would be reduced to its permanent strength, which would be busy with nursery work during summer and autumn. In many cases operations of this class might be combined with the utilisation of catchment areas for waterworks. If afforestation were undertaken on a large scale, there was no reason why 5 or 6 million acres should not gradually be brought under wood, thus producing the bulk of the ordinary timber required by the country. Every acre afforested would require an expenditure on labour of, say, 2*l.* for planting. After the forests had been established, every acre would require about five days' labour a year, or a total of 30 million days for the work in the forests. Then there was the large business of transport and working up the timber, as well as the various industries which would spring up. On the whole he estimated that a population of not less than 2½ million people would find additional work in the country, counting five members for each family.

On the motion of the Chairman a hearty vote of thanks was accorded to the lecturer, and a vote of thanks was also passed to the Chairman.

Mr. N. Smith, past Master of the Company, said that the Company, recognising the importance of the subject, recently offered prizes for essays on forestry, and they had made the following awards:—Winner of the first prize (20*l.*), Mr. A. C. Forbes, of Longleat, Warminster; winner of the second prize (10*l.*), Professor W. R. Fisher, Cooper's Hill Engineering College.

The following essays were very highly commended—Mr. T. Berwick, of Raby Estate Office; Professor G. S. Boulger, Richmond; Professor C. E. Curtis, Brockenhurst; Mr. R. G. Forbes, Hursley Park; Mr. A. P. Grenfell, Bridgwater; Mr. R. Henderson, Gortland Estate Office; Mr. G. N. Macdonald, Raith Estate Office; Mr. A. E. Moeran, Portumna, Galway; Mr. A. Murray, Paultons, Romsey; Mr. Osmond Smith, Southsea; Mr. Leslie Wood, East Grinstead.

The meeting then terminated.

The Workman of the Middle Ages.

The third lecture of the series was delivered on Thursday last week, when Mr. C. R. Ashbee, M.A., gave an address on "The Workman of the Middle Ages," the Right Hon. Viscount Dillon, P.S.A., presiding.

Mr. Ashbee said there were three essential points which, in studying the life of the middle ages, we had to keep in mind—three pivots on which life hinged. Life in the middle ages was aristocratic, religious, and artistic. Those three conditions were so outside our experience nowadays that we might find difficulty in fully realising them. As to life being aristocratic, the feudal system, with its barons and kings at one end and its serfs, who were tied to the soil, at the other, implied an aristocracy. In order to appreciate what sort of a man the mediæval workman was it must be remembered that he belonged to an exclusive society of his own, girt round with charters and privileges—a society democratic and collectivist within itself, but exclusive and often impossible of access to the outside world. As to life being religious, he meant that the conduct and actions of men were swayed by supernatural and ultra-rational considerations in a way that it was difficult for us to realise nowadays. The England of the XIVth century had only one God for everybody, and the outward and visible expression of that God was the Church. Finally, life was æsthetic, which implied an understanding and an enjoyment of all those qualities in our natures that were the outcome of leisure and imagination—the love of music, the love of form, the love of colour. This æsthetic element of life found its highest expression in architecture—in the art of the ecclesiastical builder. The best men, the greatest minds, the finest genius of the workshop (at least, in England) went into building. Everybody understood and appreciated, for it was the popular art. It was impossible to find a parallel in our own time, because modern interests were so manifold and varied; but if we imagined that everything that had to do with letters and reading had been effaced from our lives—newspapers, books, lectures, etc.—and that building had been substituted for it—building, with its subordinate arts, its sculptured and painted stories, its stories in metal and carved wood, and stained glass—we should get some slight notion, perhaps, of the absorbing importance of the builder's art in the English middle ages. The builder's art was the great occupation, and the Church upon which it depended, and which it expressed, was the great profession. In his picture, then, of the mediæval workman he made him a mason, because not only was that the popular occupation, but the mediæval mason in England had, before all other workmen, left the noblest mark of himself, and other trades and occupations ranked themselves beside, and modelled themselves upon, the masonic organisation. England was then thinly populated, with here and there what we should call villages surrounded with walls. Those were the mediæval towns, and inside each little town was a little democracy which, speaking generally, hinged upon the guild or trade union. It was really much more than a trade union—it exercised all those functions exercised to-day by magistrate, employer of labour, town council, labour bureau, union, factory inspector, benefit club, schools, burials, etc. There might be one or there might be many guilds in a town—that depended on its size—but every able-bodied citizen belonged to some guild or other, and those guilds were for the most part religious in character, and as the towns grew they differentiated into trades. The guilds collectively governed the towns by representation. Of course, nothing like our great factories existed. The workshop was small, and the master worked in his apron together with his two or three journeymen and his two or three apprentices, who also did him personal service, and both apprentices and journeymen could in their turn become masters. The different masters represented their various workshops in the guild, the guild legislated for the whole trade or group of workshops, and the different guilds together governed the town. The idea of all was the maintenance of the highest standard of life to the citizen. Roughly speaking, this was the industrial organisation of the English town in the middle ages, and that organisation was one of spontaneous growth; it was dependent for its effectiveness upon the power of the citizens for voluntary association.

The lecturer then gave an interesting account of a masons' guild. The character and genuineness of workmanship was the guild's first consideration, and the first of the moral rules was the character and trustworthiness of the craftsman. The master's duty to the whole organisation was a point insisted upon, as well as the seven years' apprenticeship and the master's duty to his apprentices. The organisation had no fixed quarters; they moved about from place to place. Co-operation and competence were also insisted upon, and the workman's duty to his master. The dominant note of the mediæval workshop was that no one should do anything that would turn the craft to shame. The mason was the spoilt child of the middle ages; he worked for his order and his God. There was no fight for subsistence, that was found him; there was no fight with time, that was non-existent. Were the work not finished this year, it might be finished the next—good building could not be hurried.

The lecturer described the system under which the mason worked, and said that an observance by the workman of the code of moral rules called forth certain definite traits, such as reverence, strength and virility of character, discipline, æsthetic sensibility, the faculty for co-operation, and the consequent power and determination of resistance to any attempt at an attack on the liberties of his town or his order. But by the guild system the work was everything, the man nothing, and yet this went to the building up of noble character.

The lecture, which was illustrated by lime-light views, included some interesting particulars of Henry Yevele (who built the Charterhouse), William of Wickham, and Nicholas Close.

THE INSTITUTE OF SANITARY ENGINEERS:

WATER CLOSETS: THEIR SANITARY CONSTRUCTION AND MAINTENANCE.

A SESSIONAL meeting of the Institute of Sanitary Engineers was held on the 2nd inst. at the rooms, No. 19, Bloomsbury-square, when Mr. G. W. Chilvers read a long and interesting paper on "Water-closets: their Sanitary Construction and Maintenance." Owing to pressure of other matter we are not able to give more than the following extracts from the paper:

"The last twenty years has witnessed vast improvements in water-closet apparatus. The old pan closet, with its D trap, is almost extinct: another kind which is, happily, being wiped out of existence is the old hopper closet, with its accumulation of filth on the inner surface and its dribbling supply of water.

"The first improvements on the above were the wash-out and plug closets. They were undoubtedly better than the older kind. But the accumulation of filth behind the basin *in* one, and round the plug in the other, and the impossibility of cleansing the trap with any reasonable amount of water, led sanitary engineers to devise the modern wash-down and valve closets. There are many variations of these in use and on the market, and improvements on them are constantly being made. They, however, remain the two principal kinds in use to-day.

"Omitting, for the moment, the valve closet, it may be said that all forms of water-closet requiring an enclosure ought to be barred from use by a by-law enforced in all districts. The pedestal wash-down closet in one piece of earthenware is without doubt the best kind of water-closet for all ordinary purposes; in fact, in my opinion, for all purposes. This closet is made in great variety, and under many different names. It would be invidious to mention any particular one at this time. I have no doubt you each give a preference to some particular pattern. To our younger members it may be well to say, do not be led away by any advertisement or description of a closet, especially a new one. Test them under varying circumstances for yourselves. Some will act under certain conditions better than others. When you have satisfied yourselves on the matter, stick to the kind you prefer. If you value your client, give him an article which has experience behind it. Let others try the experiments.

"A good pedestal closet is true in form, with an even and impervious surface, shaped so that the excreta drops clear of the sides into the water, has a large surface of water in the basin, a seal of about 2 in., the flushing rim so arranged that every part of the basin is cleansed during the flushing operation. The water directed in such a manner that its full force is brought to bear on the solids in the pan, forcing them into the trap at the commencement, so that the remainder of the flush may drive them through the drain.

"There are certain of these closets on the market which, especially with a three-gallon flush, create a perfect maelstrom in the basin. The ordinary observer remarks the force of the water and thinks what a fine apparatus he has. The more intelligent student would, however, notice the paper and excreta being whirled about the basin, and then, just in the last effort of the flush, being carried out of sight. It is evident that in such a case the trap is never properly flushed until the next operation of the apparatus.

"The outside of a pedestal closet should have an even surface, without the projecting ornaments often seen on them. Colour, white, both inside and out. In fact, there is no better finish for all surfaces in sanitary offices than white enamel of good quality, which is easily washed and shows up at once any accumulation of dirt.

"Of the many improvements on these closets

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the syphonic is no doubt the most conspicuous, the principle being, as you are all aware, to *draw* out the excreta from the basin by syphonic action, instead of forcing it out as in the former case. The advantages seem to be, greater force in flushing, and in most cases a double seal through the use of two traps to get syphonic action. The disadvantages are, greater cost, more noise in flushing, and they generally require at least three gallons of water to make them act properly. With regard to the flushing cisterns used in connection with pedestal closets, it may be well to say at once the simplest are generally the best. Sanitary engineers are apt to forget that these cisterns are not operated by experts in the ordinary course, but by the general public. They should, therefore, be simple in construction. Act at once with an easy pull of the handle, and the necessary parts so put together that there is nothing to get out of order with fair usage. The flushing pipes are an important item in obtaining a good flush. Their size, of course, varies with the height of the cistern above the basin. Generally speaking, all bends are to be avoided as much as possible, particularly sharp ones, and where they do occur the bore of the pipe must not be diminished. Manufacturers are always ready to lay any failure of their apparatus on to the bad method of fixing, doubtless in many cases with good reason. It should, therefore, be the endeavour of the sanitary engineer to see that all apparatus is fixed to secure the full advantages that may be obtained.

"The seats should, of course, be of hard-wood polished. There are objections raised to the use of pedestal closets in some cases, one or two of which may be noticed briefly.

"The principal one appears to be that they are noisy in action. This difficulty is not altogether insuperable, even with present-day apparatus, and there is no doubt that continued improvements will reduce the unavoidable noise to a minimum. That from the re-charging of the cistern has already been overcome by silent action ball valves, and the use of storage cisterns from which to draw the supply. That caused by the flushing action cannot altogether be obviated. It only continues for a few seconds, however; and is, or should be, only perceptible to the operator, if the walls are constructed as previously described, and the advantage accruing through the force of the flushing is much greater than any little disadvantage from the noise. . . . . .

"The valve closet now demands our attention. It still survives. Whether it is a question of 'the survival of the fittest' is also a question. Some of the advantages in its use, from a sanitary point of view, appear to be—greater area and body of water in the basin; double seal of basin and trap; noiseless in action; absence of pipes and flushing cistern, and the enclosure to receive draperies and give support. The disadvantages are:—Much greater cost; enclosed mechanism to get out of order, and harbour dirt, and retain effluvia; less force of flush; the joint between soil pipe and apparatus is out of sight and is generally made with red lead; liability of the pan to become empty through valve leaking from matches, cigar ends, etc., getting on the seating.

"Wherever water-closets are fixed for the use of the general public, and in all business establishments, the pedestal closet is admittedly the best. For dwelling-houses, æsthetic people prefer to see a piece of cabinet work enclosing the apparatus. Sanitarians advocate free access to all parts for cleansing purposes, and do not regard the water-closet as a piece of drawing-room furniture. If a valve closet is used, let it be one of the pedestal kind, which has all the advantages, while it reduces the disadvantages and can also be used as a urinal."

As to the flushing of water closets, the author gave the views of sanitary engineers, and also of the water companies, and concluded as follows:—

"Such being the case from both sides, what can we do to alter the matter? As far as the London district is concerned, an exceptional opportunity is presented to us just now—and, on the face of it, a more favourable one than has occurred at any previous time during the last thirty years—of laying the claims of the public health before a new Authority. Reference is, of course, made to the new Metropolitan Water Board. In taking over the concerns of the existing Water Companies, no doubt new regulations affecting the supply of water to consumers will be issued. In making them, due regard will be had to the *efficiency* of the supply.

"As the Board are a public body they will, while economising their resources, doubtless let the accent be on the efficiency in the interests of public health. Therefore, if a well-considered memorial were laid before them on the subject of flushing water-closets, there is no doubt it would receive the fullest attention by them. What more suitable body of gentlemen could be found to present this petition than the Institute of Sanitary Engineers—consisting as it does of men actively engaged in designing and constructing these conveniences, and therefore well able to appreciate the present difficulty, and to lay the claims of the public health before the Board in both a practical and scientific form? We ought not to let this opportunity pass—in fact, the Council of the Institute ask you to-night to unanimously carry a resolution authorising them to approach the Board, asking that the present limit of a two-gallon minimum supply to water-closets may be withdrawn in favour of one more in accordance with the requirements of present-day sanitation, pointing out that the *efficiency* of water supply to closets is in the interest of public health, as well as efficiency of supply for other purposes; also that an anomaly exists in the fact that an *unlimited* supply exists for bath and lavatory, which may be used as many times each day as desired. Yet a water-closet which a person only uses about once or twice in the same time is limited to two gallons. Should your efforts be successful, as I sincerely hope they will, you will deserve and obtain the thanks of all concerned for the public health, and have assisted materially the advance of hygiene."

THE BUILDERS' ACCIDENT INSURANCE, LIMITED.

THE twenty-third annual general meeting of the Builders' Accident Insurance, Limited, was held at 31 and 32, Bedford-street, Strand, W.C., on the 2nd inst. In the absence of Colonel Stanley G. Bird, C.B., through illness, the chair was taken by Mr. Frederick J. Dove.

The minutes of the last meeting having been read by the secretary, Mr. R. S. Henshaw, and confirmed, the secretary read the Report and accounts for the past year. The Report stated that during the period under review, the company has received notice of 1,200 accidents, an increase of 163 on the previous year. The Board had satisfaction in recording an increase of 1,583*l.* in premium income, and also an increase of 20 per cent. in the number of policyholders.

"The question of those claims for permanent injury cases under which half-weekly wages were being paid—many of which had continued for a considerable period—was referred to at the last meeting, and a strong opinion expressed of the desirability of discharging those liabilities by the payment in each instance of a lump sum. This policy had been acted upon, and the Board have been able to deal with the majority of such cases at less than the amount allocated for the purpose. Although this necessarily increases the item of claims as appearing in the balance-sheet, the directors feel confident that the consequent reduction of the company's liabilities must be no less satisfactory to the members than it is to themselves.

"The experience of the Board during the past year has shown that the company must expect in the future an ever-increasing number of claims which, though small in themselves, involve a large amount of detail work by the staff, and, in the aggregate, a considerable monetary compensation.

"The investments of the company had been taken at the present depreciated values, which, with the causes mentioned in the foregoing paragraphs, accounts for the somewhat reduced figures standing in the balance-sheet to the credit of the reserve and unexpired risks.

"Reference was made in the King's speech to a proposed amendment of the existing Acts, and the directors await the proposals of the Government in this direction with much interest, and as a Departmental Committee of the Board of Trade is now collecting evidence upon the working of the Acts, the chairman has placed his views on this subject and the experience of the company so far as the building trade is concerned before the Committee. . . .

The secretary then read a speech by Colonel Stanley G. Bird, the Chairman of the company, in which the report of the auditor, Mr. Chas. Fox, chartered accountant, was included. Colonel Stanley Bird said he must congratulate the company on its highly satisfactory condition, notwithstanding the apparent shrinkage of the funds. The fact was they had now settled up the bulk of their outstanding and long-standing claims, for considerably less than they had anticipated. They had estimated in the same liberal way for extinguishing those still outstanding, and for the current year, and he was sure, as wise men of business, they would cordially approve of this policy. As to the depreciation of the investments, they were suffering in the same way that every one throughout the world is. He hoped they had touched bottom at last, and that in due time affairs would recover; the securities would then, he hoped, rise in a corresponding proportion. It would be a matter of satisfaction to the members to see the increase in the premium income and in the number of policyholders, particularly as several insurers of old who left them had returned, and that the bulk of the new business which had been received by the company had been introduced by existing policyholders. There had, during the past year, undoubtedly been a great depletion of trade, and the company had consequently suffered to some extent. The law also was becoming better understood by workmen, the officials of Trade Unions, and solicitors generally. It had been his duty as representing the company, and also having regard to the very important industry which the company represented, to give evidence before the Departmental Committee appointed by the Home Office to inquire into the working of the Workmen's Compensation Act, 1897, and the Employers' Liability Act of 1880. In the course of his examination he explained and elaborated as much as possible the effect of the Acts in practice, particularly with regard to the height of buildings. The question also of scaffolding and the true definition thereof was fully placed by him before the Committee. He also pointed out the desirability of having the duties of the medical referee more clearly defined, and of notice being given immediately in the case of an accident. He might mention for the information of members that it was the policy of the directors to deal with all claims as far as possible as they arose in a fair and liberal spirit, which the directors believed met the satisfaction not only of the policyholders, but also of the injured workmen.

On the motion of the Chairman, seconded by Mr. H. H. Bartlett, the report and accounts were received and adopted.

The following directors were then re-elected:—Messrs. Thomas Barnsley, Woodman Hill, A. Krauss, William Nicholson and G. H. Trollope, and fees for their services were also agreed to.

On the motion of Mr. T. F. Rider, seconded by Sir John Mowlem Burt, Mr. Charles Fox was re-elected as auditor.

Sir John Mowlem Burt moved that an expression of regret be conveyed to Colonel Bird at the cause of his absence; and also a vote of thanks to Mr. Dove for presiding.

Mr. J. Howard Colls seconded, and the motion was agreed to.

The Chairman replied, and the meeting terminated.

THE SURVEYORS' INSTITUTION:

THE LAND PURCHASES FOR THE NEW NAVAL BASE AT ROSYTH, ON THE FIRTH OF FORTH.

AN ordinary general meeting of the Surveyors' Institution was held on Monday evening at No. 12, Great George-street, Westminster, S.W., the President, Mr. A Buck, in the chair.

The Secretary, Mr. Julian C. Rogers, having read the minutes of the last meeting,

Mr. Percivall Currey, Hon. Secretary, read a list of donations to the library and library fund, and, on the motion of the Chairman, a vote of thanks was accorded to the donors.

Mr. Thomas Binnie then read a paper entitled: "The Land Purchases for the New Naval Base at Rosyth, on the Firth of Forth." Having mentioned that in the early months of last year the Admiralty decided that a new naval base should be established upon the north shore of the Firth of Forth, a short distance from the Forth Bridge, he said that, along with Mr. J. Campbell Murray, factor and commissioner to Sir John Stirling Maxwell of Pollock, he was asked by the Admiralty to advise them in connexion with the acquisition of the necessary land. A naval base in the Firth of Forth would be no new thing; it would only be a return to the state of matters which prevailed long ago, for when Scotland had a navy of its own, it was in the Firth of Forth that the ships were built. The site selected for the new naval base consisted of two properties: (1) The Barony of Rosyth, belonging to the Marquis of Linlithgow, and (2) the estate of Castlandhill, belonging to Mr. R. N. H. Newton. These two properties extended in all to about 1,463 acres, of which 1,178 acres were dry land, and 285 acres were foreshore, *i.e.*, land covered by the sea at high-water of ordinary spring tides. The eastern boundary of the lands was about one-third of a mile west from

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the Burgh of Inverkeithing. They extended along the shore for fully two miles, and their greatest breadth backward was fully a mile and three-quarters. Generally the lands were gently undulating, but at two points they rise to a height of fully 200 ft. above sea-level. On one of these points there was a small reservoir belonging to the local authority, which was likely to be greatly enlarged to supply the naval works. On a small promontory, which became an island at high tide, there stands the ancient Castle of Rosyth. The castle consists of a tower or keep, measuring 48 ft. 6 in. by 41 ft. 3 in., and four stories in height. It seemed to have been built during the second half of the XVth century, and at a somewhat later date a number of additional buildings of two stories were attached to its eastern and northern sides. The walls of the keep were almost entire, but the other buildings were ruinous. In front of the property was St. Margaret's Hope, the well-known anchorage in which the vessels of the Royal Navy had usually lain when visiting the Forth.

A branch of the North British Railway passes within less than one hundred yards of the north boundary of the property bought, and the levels were such that a siding could very easily be constructed to connect the naval works with the railway system of the whole Kingdom. They would in this way also be brought into touch with the great Fife coalfields, which were now being so rapidly developed. The total rental of the two properties bought amounted to 1,623*l*., and the purchase money amounted to 122,500*l*. As was usual in the compulsory purchase of land, the minerals in Roysth were reserved by the seller. These had now been purchased, and their value had been fixed by arbitration at 12,250*l*. more.

The lecturer then made a statement of the facts which led to the payment of what appeared, on the face of it, to be an excessive price, in the course of which he explained that in Scotland when agricultural land was taken compulsorily the value was almost always fixed at 30 years' purchase of the fair rental, and to that 50 per cent. was added for compulsory sale. When building land was taken compulsorily, only 10 per cent. was added to the price. Throughout all the negotiations for the purchase of the land at Rosyth these transactions were treated as being in fact compulsory sales. Neither property was in the market for sale, and the owners were unwilling sellers. In all the estimates of value offered by the critics of the Admiralty, no value appeared to have been placed upon the woods and woodlands which extended to more than 50 acres. The wood was of little commercial value, but the value of the woodlands was an important element in estimating the value of any property. On Castlandhill there was a charmingly situated small mansion house, which, with the offices and lodges, could not have been built for less than 7,000*l*. This house, with a garden and pleasure-ground, was let at a rent of only 68*l*. Castlandhill, which gave its name to one of the estates bought, was a very steeply-sided hill of whinstone, which rises to a height of more than 200 ft. This whinstone is of considerable value. A number of quarries are working in the immediate neighbourhood. The owner of Castlandhill undertook that, before letting any of his remaining rock to any other person for the purpose of opening a sale quarry, he should first offer it on the same terms to the tenant of the existing quarry. This obligation rested upon the Admiralty. But it was expressly declared that the Admiralty may quarry as much of the rock as they please for Government works, for road-making, and for the erection of dwelling-houses and other buildings on Government lands. All restriction upon the use of the rock ceased in 30 years. This was a most important consideration. The mass of rock in Castlandhill was enormous, probably not less than fifty millions of tons. The quality appeared to be quite as good as that found in the neighbouring quarries, for which there was paid a lordship of 6d., and even 9d. per ton, for all kinds of dressed stone, and 4d. per ton for marketable road metal. Castlandhill was close to the sea, and a pier or jetty from which to ship the stone could very easily be constructed. Large quantities of whinstone quarried on the adjoining lands were shipped every week to England. Indeed, we were told that the Admiralty are very large customers of one of the quarry-masters. They would now be able to supply themselves with all the road metal and whinstone sets which they required in all the dockyards in Britain, if they chose to do so. But the chief value of the rock to them would be in connexion with the construction of docks, and the erection of buildings upon Rosyth. The possession of such a quantity of rock in the immediate neighbourhood of the proposed dockyard would be of immense value to the Admiralty and their contractors, and should greatly reduce the cost of the proposed works. On another part of the property purchased there were more than 30 acres of sandstone rock, lying in practically level beds and with very little cover. The Castle of Rosyth had been very largely built of this rock, and its quality might be judged of from the fact that on many of the stones in the castle the tool marks were still visible, and the corners of many of the hewn stones were quite sharp, although the building was considerably more than 400 years old. The Admiralty had purchased not only sufficient land for the largest naval establishment ever likely to be erected on the shores of the Forth, but they had also bought a large area of land on which dwelling-houses would be built for their workpeople. It was believed that 1,000 acres would prove more than sufficient for all the requirements of the naval base. The naval works at the great ports of Chatham, Portsmouth, and Devonport vary considerably in size, but it might be taken that they occupy about 1,000 acres at each place, exclusive of foreshore. At Rosyth there is such a fine bit of foreshore and shallow water that less solid land would be required. It was difficult to imagine that the naval base at Rosyth would ever rival in importance the great establishments in England just named, but if we assumed that 1,000 acres in all would be set apart at Rosyth for the Government works, there would remain 463 acres of land which could be disposed of for the erection of the dwelling-houses, shops, and the other buildings required in a town. It had been stated on behalf of the Admiralty in the House of Commons that they do not themselves intend to erect houses; they propose to feu the land, and to leave the houses required to be provided by builders in the ordinary way. But the future town would, no doubt, be laid out by the Admiralty as ground landlords, and we might expect that care would be taken to provide for the health and enjoyment of the inhabitants, who were expected ultimately to number many thousands. Lord Linlithgow's representatives desired that only the land required for the works proper should be acquired by the Admiralty, leaving to his lordship the land which would be required for dwelling-houses. On the other hand, the Admiralty held that, as their works were to be the means of collecting the population to occupy the houses, to them should belong the profit arising from the erection of these houses. In other words, both seller and buyer claimed the unearned increment which would arise from the creation of a new town. Lord Linlithgow's advisers maintained that the Admiralty had power to acquire compulsorily only the land actually required for the naval works, and in this view they were supported by the lawyers whom they consulted. The Admiralty's advisers, on the other hand, held that the Admiralty could acquire land on which to build houses for their own workpeople. But it was a much more doubtful point whether the Admiralty could compulsorily acquire land which they might intend to sell, or feu, to third parties, who would erect upon it the houses required, not only by Government employees, but also by the shopkeepers and other tradesmen, who so largely made up the population of any town. The ordinary feuing rate for workmen's houses in the outskirts of the neighbouring town of Dunfermline—three miles distant—was from 20*l*. to 25*l*. per acre. One enterprising speculator had already secured some land adjoining that purchased by the Admiralty, and had undertaken to pay more than 50*l*. per acre per annum for it. If only two-thirds of the 463 acres of available building land belonging to the Admiralty were feued at the lowest of these rates—20*l*. per acre—the annual revenue would amount to over 6,150*l*. While interest at 3 per cent. upon the purchase money for the whole property bought, including the minerals, amounted to only 4,042*l*. 10s. If these estimates were realised, the result would thus be that the Admiralty would have a clear income of over 2,100*l*.; the 1,000 acres of land devoted to the naval works would cost them nothing; and they would still have 150 acres of land for parks, playgrounds, schools, or any other public purpose they desired to devote it to, so that Rosyth might indeed be made a Garden City. With all these considerations in view, they felt bound to bring their negotiations for the purchase of the lands privately to a successful termination, although they might require to pay a very liberal price, as undoubtedly was done.

In Parliament it was said that, instead of paying for these lands the sum which was given, the Admiralty should have taken the steps needed to enable them to acquire the land compulsorily, and then left the price to be settled by arbitration. It was at least uncertain that they could have acquired in this way the land on which the future town of Roysth will stand. But assuming that this course was open to them, the question arose, would it have been wise to follow it? Some who had had a great deal to do with arbitrations had come to hold the opinion pretty strongly that the more cases they settled privately the better it was for their clients. The advisors of the Admiralty felt confident that the land purchases at Rosyth had been arranged upon terms which would prove to be by no means unfavourable for the buyers.

On the motion of Sir J. Rolleston, M.P., seconded by Mr. J. H. Sabin, a vote of thanks was passed to the lecturer.

It was announced that the next meeting will be the second of the two afternoon meetings arranged for the convenience of country members, and it will take place at four o'clock on March 21 instead of April 18. The discussion will be resumed on Mr. H. J. Elwes' paper on "British Timber and its Uses."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

IV.—SAVOY HOTEL AND NEW FLOWER MARKET, COVENT GARDEN:

THE Savoy Hotel is now undergoing considerable enlargement and development. The Architectural Association was afforded an opportunity of inspecting the new works by the permission of the architects, Messrs. Collcutt and Hamp, on Saturday, March 5, when a large body of members attended this, the fourth visit of the session. In the absence of Mr. Collcutt, who has long been associated with the hotel, Mr. Hamp kindly undertook the duties of conducting the party to the numerous departments, and gave information upon the complex nature of the problem in hand.

The key to the whole scheme is the providing of an entrance to the hotel direct from the Strand, and in order to achieve this, it became necessary to acquire large properties facing that thoroughfare, the rebuilding of which is the subject under notice. The widening of this part of the Strand by the Westminster City Council was an element affecting the areas of the site, and necessitated setting back the new fronts 19 ft. from the old building line. We published "Notes," giving some historical information of the disappearing buildings, on October 26, 1901, and on the question of the compensation in our issue of February 8, 1902. The old-established restaurant known as "Simpson's" was included in the demolitions, and is now re-erected.

A new 40 ft. roadway, occupying approximately the position of an old street called Beaufort-buildings, has been constructed from the Strand level and approaches a covered court, from which access is obtained through the new entrance to the hotel now called for convenience the "south block"; the buildings on either side of this road and facing the Strand are termed "east" and "west" blocks respectively. The new levels involved an alteration to the side entrances of the Savoy Theatre.

The south block, intended wholly for hotel purposes, contains on the ground floor a large entrance hall, from which a flight of steps leads down past a vestibule and lavatories to a large foyer now at the same level as the well-known restaurant overlooking the Thames Embankment. This foyer is practically an enlargement of the dining-room formerly overlooking the fountain court, an illustration of which we gave on July 11, 1896, so that the entrances to the hotel are now given greater dignity and importance. The rapid fall in the streets towards the river produces a large amount of basement space, which appears to have been fully utilised. New kitchens and service-rooms have been built below the Hall, the staff dining-room placed under the new courtyard, and refrigerators, ice-making plant, etc., are provided below the

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new roadway. The kitchen, the vital part of all hotels, is therefore centrally placed for all hotel demands and for the purposes for which it will be required in the east block. In a sub-basement, and level with Salisbury-street, are placed a heating and electric-generating plant and a motor garage.

The east block is the largest of the three divisions, and comprises a variety of business and residential premises.

On the ground floor, and in connexion with the hotel, is a large Parisian café, one side of which opens to the covered courtyard, an independent approach being also provided from the new roadway. The remainder of the frontages consists of shops, an entrance to the upper floors, and entrance leading to Simpson's restaurant, the gentlemen's dining-room of which is on this floor. The smoking-room and kitchens are in the basements. Above the shops are two floors of business offices; whilst the first floor of Simpson's contains ladies' dining-room, chess-room, and Knights' Club room—the meeting place of an old-established institution. The whole of the remaining floors contain small residential suites, consisting of sitting-room, one and two bed-rooms, bath, etc., and the eighth or top floor is arranged as staff-rooms. Provision is made for serving meals to the suites when required, but it is anticipated that the café will cater for most of what is required.

The west block will be given up entirely to shops and offices. At the time of the visit the steel framing of this part of the work was very little higher than the ground-floor. The east and south blocks were roofed in and nearing completion.

With regard to the construction, it should be borne in mind that time has been the great factor in the scheme. Until these works were in hand, the Savoy Hotel Company undertook its own building operations, under the organisation of Mr. George Holloway; for the present work, however, a contract was made with an American firm, Messrs. J. Stewart and Co., who have hurried on the buildings by methods very similar to those practised in the United States. Messrs. Dorman, Long, and Co. have supplied most of the steel construction above the ground line. In the formation of the new roadway and sub-basements Messrs. Handyside, of Derby, were responsible for the girder and stanchion work. The buildings are faced with the faience which Messrs. Doulton, the makers, term Carrara ware, and which has a variety of creams and dull buffs in its colouring. The architects have employed flat treatments relieved by oriel windows and two cupolas on the Strand front only. The upper part of the hotel addition has a deep frieze with large figure subjects.

The interiors call for no special reference, and have the effect of having been designed against time. Messrs. Jackson and Sons have supplied a large number of modelled plaster ceilings based on Adam, Louis XV., and other well-worn periods. In the smoke-room of Simpson's restaurant, however, Mr. Bankart has designed and modelled a charming ceiling and frieze, in which a pleasing flat treatment shows an old English influence.

Various marbles are employed in lining walls and piers, in which the colours selected lack interest. In the lavatories, however, some beautiful mosaic lining made by Mr. Rust is effectively introduced. Many patent materials are in use, amongst which Mack's plaster slabs for internal partitions were the most noticeable. The heating arrangements are necessarily of a complex nature, and a new feature is the use of "thermostats," or self-regulators, fitted to the radiators. It was apparent to the visitors that much in the nature of special permission had been obtained from the local authorities, as amongst other details it was seen that all the soil-pipes, bath, and lavatory wastes were fixed inside the building, to the advantage of the exteriors.

At a late hour a small number of the visitors assembled in Covent Garden to examine the new foreign flower market now nearing completion from designs by Messrs. Lander, Bedells, and Crompton. The last-named gentleman kindly conducted the party through the new building, and gave, in addition, much useful information. Here is a well-designed addition to the many buildings which are comprised in this important market centre. A strong rendering of the later English Renaissance in brick and stone, characterises the general design. The market proper is placed on the first floor, below which is the usual open space, the area of which is considerable.

Importance is given to the four angles of the building in which staircases and lifts are located, and which rise as square pavilions crowned by small lead domes. Intermediate piers of glazed brickwork carry the girders of the superstructure, and it is noteworthy that the honest purpose of the construction is everywhere revealed. Some broad effects are obtained from masses of red brick facing. The detail is satisfactory throughout, and, indeed, as an architectural conception, the inclusion of this building in the afternoon's work was felt to add materially to the success of one of not the least of the means of instruction which the Architectural Association provides.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—On the 7th inst. Professor Simpson was the recipient of a silver inscribed inkstand from the members of the Liverpool Architectural Society on the occasion of his resignation of the chair of Architecture at Liverpool University to take up a similar post at University College, London. Mr. John Woodfall, F.R.I.B.A., presided, and in presenting the testimonial to Professor Simpson he paid a high tribute to his personal worth, and endorsed the expressions of the University Council in regard to him. By persistent and energetic effort he had built up a school of architecture, the reputation of which extended far beyond Liverpool, and had attracted students from remote parts of the country. He also secured for architecture inclusion among the courses of study qualifying for University degrees, and obtained due recognition of the degree and diploma from professional authorities. Professor Simpson was President of the Liverpool Architectural Society for two years, and was the first President they had had from the University. He proved a most painstaking President, and the members of the Society, in presenting to him a token of their esteem, trusted he would be blessed with health and success in his new sphere.—Professor Simpson, in returning thanks, said it had always been a source of the keenest gratification to him, that during the time he spent in Liverpool he was on terms of friendship with the architects of the city. By a coincidence his successor, Professor Reilly, was present that evening, and he would ask them to extend to him the same friendship and support which they gave to himself during the nine years he spent amongst them.—Mr. G. Gilbert Scott, joint architect of the Liverpool Cathedral, then gave an address explanatory of the cathedral, and exhibited twenty fine drawings of the building to be erected on St. James' Mount. Mr. Scott said it was, of course, impossible to produce a design which would satisfy all critics, and if they attempted to do that they would succeed in pleasing none. There was no concealing the fact that the proposed erection of a cathedral for Liverpool was epoch-making in the history of English architecture, because they were building a vast church, which in point of size was not equalled by any cathedral church in the United Kingdom, and which would go down to posterity as an example of the architecture during the first half of the XXth century. Much advance had been made during the last fifty years in the architecture of this country, but we were still far from having a distinctive national style. It was little short of a calamity that such a state of things should exist at the present time, for this was undoubtedly a period of extraordinary building activity, which had no parallel in the nation's history. Let them consider the enormous buildings that were being erected throughout the land, upon which vast sums of money had been expended, and to what æsthetic purpose! They would stand condemned in the eyes of posterity by these ghastly blunders, so long as people ignored the fact that architecture was an art and not a business and being so required an artistic nature. The all-important and burning question of style in present-day architecture was constantly being discussed, and when a work of such magnitude as a cathedral was undertaken, the discussion became doubly keen. Those who clamoured for a new style lost sight of the fact that no new style had ever come suddenly into existence and flourished. The whole history of architecture showed a slow and gradual development, and was it likely they were going to alter all of a sudden that which had been the rule for thousands of years? Was there the slightest probability that when a building like the Liverpool Cathedral was contemplated a new and original style would suddenly come into existence—a style which was not only original, but, what was far more important, beautiful? To some the latter seemed only a secondary consideration, and their frantic efforts to attain originality at the expense of beauty would be most reprehensible were it not so pathetic. If they waited until all architects were united in producing a fine national style, Heaven only knew when Liverpool would possess a cathedral. The desire expressed by the committee, but subsequently withdrawn, that the cathedral should be a Gothic building, no doubt influenced many who, like himself, were wavering between the claims of Gothic and those of other styles. Personally, he was not a rabid Goth, and nothing annoyed him more than to hear people remark that no other style approached the beauty of our English Gothic. No one admired and loved this beautiful style more than he did, but to hold it up as the very acme of perfection, in comparison with which all other styles were hopelessly inferior, displayed narrowness and ignorance which were lamentable. Although he decided upon Gothic, he confessed he had dreams of quite another style, or rather the development of a style. But his ideas had not had time to mature, and he preferred until he was older to remain on safe ground rather than court failure by being too previous. Gothic could not go much further. It was nearly at the end of its tether, and before very long would die out as completely as it did in the XVIth century. Whether Liverpool Cathedral would rekindle the flickering flame and prolong its life a few years, or whether this was the last flare-up of the Gothic revival it was idle to speculate. It might mark the end of a notable movement which, if it had not achieved any very great success, had without doubt paved the way for better things. Gothic architecture underwent a process of development lasting over 400 years, which seemed to us with our modern ideas of time a period of extraordinary length in which to make so comparatively small an advance. Was it surprising, therefore, that we failed to get much further in a style that had already been completely worked out? In spite of these objections, however, he decided upon Gothic, because he more or less understood it, and felt tolerably safe. In preparing his design he decided that solemnity was to be its keynote, and this included dignity, grandeur, and simplicity. The whole effect at which he aimed was to be produced by the massing, grouping, and proportion of the various parts, not by prettiness or luxuriance of detail. No amount of rich ornament could, to his mind, equal the beauty and charm of a blank wall relieved by a touch of rich detail. This lack of blank wall was, perhaps, the least satisfactory feature of our fine old cathedrals. In designing a modern cathedral the first thought that occurred was how to treat the central space. He felt convinced that the central space must be so designed as to form the predominating feature of the cathedral, both inside and out, and the planning and designing of this important part was the first difficulty to be got over. He was compelled, however, to abandon the idea of treating a large central space satisfactorily, but he still felt that whatever form the central feature ultimately took, it must, above all things, be the crowning feature of the exterior, so that the eye would be carried up from the less important parts to it, the latter in their turn giving scale and, as it were, supporting the central pile. The actual floor area of the central space, as now planned, was not less than the area of the octagon at Ely, which fact helped them to realise that the space at the crossing was not so small as was commonly imagined. This feature had been the cause of a good deal of discussion, many being under the impression that he had infringed the conditions of competition. There was absolutely no condition that the central space should be large and capable of seating 3,000 persons—there was a suggestion, certainly, but no condition. Some had remarked that the central space would be very dark, but they had evidently not noticed the four windows which opened directly into the central space. The great windows at the end of the tower transepts would play an important part in the lighting of this space. The adoption of the cross transepts in the nave and choir was not decided on merely because the idea was novel, but originated from a feeling that the Byzantine and Renaissance form of vaulting, namely, with domes and barrel vaults, was a far more impressive and dignified way of roofing a space than the

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intricate and fanciful, though no doubt beautiful, vaultings of Gothic work. There was a peculiar solemnity and majesty about the dome and barrel form which was entirely lacking in the Gothic, and though he had great admiration, he preferred the simpler and broader treatment. All the mouldings, etc., were being designed by Mr. Bodley, who stood unrivalled as a designer of beautiful and refined Gothic detail. The red sandstone to be used in the Liverpool Cathedral lent itself to large and simple mouldings, and it was fortunate that this stone was especially adapted to a type of moulding which would be thoroughly in character with the rest of the building. The original intention of having a great western court flanked by cloisters had been abandoned owing to the limitations of the site. Unfortunately there was no direct approach to the west end. If they could have arranged a fine road leading from the west front it would have been easy to get such a fine feature as suggested, with steps running the full width of the court from cloister to cloister. Although the site had several faults, it was on the whole a very fine one; it possessed a feeling of romance, which he hoped would be increased when the vast pile was completed. Lack of interest in buildings erected nowadays had been partly responsible for the forced and affected originality which characterised a great deal of modern architecture. A building should be made as interesting as possible, but beauty, which should be the first consideration, must not be sacrificed. In designing the cathedral he had endeavoured to impart a certain amount of interest to the building, taking care not to ignore beauty in order to insert a piece of originality.—On the motion of Mr. E. Kirby, seconded by Mr. T. D. Barry, a hearty vote of thanks was accorded to Mr. Scott for his remarks.

[The above report has been taken from the *Liverpool Courier.*]

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on the 7th inst., Mr. D. B. Butler, President, in the chair, a paper was read on "Some Recent Works of Water Supply at Penzance," by Mr. Frank Latham, Borough Engineer and Surveyor, Penzance. After some remarks with reference to the development of water supply works generally, the author proceeded to point out the difficulties which surrounded the question of supplementing the supply at Penzance. There the water rights were restricted, and suitable reservoir sites were not available. An experimental well and adits had been constructed with inadequate results as regards yield. The author described an exhaustive series of observations which he made throughout the neighbourhood, followed by an underground water survey, and the conclusions arrived at. He described at some length the interesting geological construction of the district from carefully-obtained data, which strengthened his former conclusions. The partial failure of the experimental shaft was accounted for and a new well-supply was resorted to with successful results. Some interesting and instructive methods adopted in timbering the shaft through exceedingly dangerous ground were described in detail. The course adopted in steining the shaft with stone was fully detailed. The timbering was so constructed as to afford the greatest possible facilities for gradual removal, during steining operations, effectually guarding against land slips, which otherwise must have occurred. The author next dealt with the construction of the service reservoir which was built on the Hennebique Ferro-Concrete system. He described the principles of this method of construction as adapted to reservoirs. The author claims this to be the first reservoir constructed under the Hennebique patents that had received the approval of the Local Government Board. He attached much importance to the careful gauging of concrete, and to that he attributed much of his success in this and other work with which he is identified. He made special reference to the care required in this respect under varying conditions and in different localities, especially where impermeability was the chief aim. Some experiments made by the author with different concretes were described, and particulars of his experience in the concrete of a defective reservoir were given. The concluding section of the paper dealt with the provisions made for checking the waste of water at Penzance. For this purpose the town is divided into nine districts, each of which is provided with a Deacon water-meter. An ample number of valves are placed on the mains in order to conduct the nightly test. Day and night inspectors are employed, and the successful result has thoroughly warranted the outlay. Pressure-reducing valves have also been provided in some districts where excessive pressure was found to be destructive to mains and fittings. The author considered a complete system of meters should be universally adopted in towns, and he drew attention to the desirability of stop taps on house services being placed in accessible situations outside the premises to afford facilities for obtaining the best results from the meters in reducing waste.

THE JUNIOR INSTITUTION OF ENGINEERS.—At the meeting of this Institution held at the Westminster Palace Hotel, on March 4, the Chairman, Mr. Samuel Cutler, junr., presiding, a paper was read by Mr. G. C. Allingham, entitled, "Notes on Electric Accumulators." After a brief reference to the Edison and other types of cell, the author confined his remarks to the lead storage cell, stating that in stationary cells it was now the usual practice to employ Planté-type positives and pasted negatives; he then discussed the "formation" of the positives, the "shedding" of the peroxide from them, and buckling. The pasting and formation of the negatives were then dealt with, as well as the gradual shrinkage of the active material, and consequent loss of capacity. The older system of building up the plates into "sections" was contrasted with the modern plan of suspending the plates freely in the cells by their lugs, and the advantages of the practice, which is rapidly coming into favour, of "burning" up all the connections on the spot, after the erection of the battery, were pointed out. The importance of arranging batteries so as to provide every facility for attention and inspection was emphasised. Motor-car and other portable cells were next considered. Here the usual practice was to employ light pasted plates, which have a very short life, but which are made as cheaply as possible, and are simply scraped and replaced by new ones as soon as they begin to give trouble. A brief outline then followed of the chemical action in the lead secondary cell, and of the causes of "sulphating" and the treatment of backward cells. The variations of voltage and specific gravity during charge and discharge were discussed, and the author laid considerable stress on the fact that, in his opinion, the gassing is the best indication of the completion of the charge of a battery. Mention was made of the importance of free circulation and diffusion of the acid, and of the consequent failure of all attempts to construct "dry" or "solid" accumulators, and the variation of capacity with the rate of discharge was touched upon. The paper concluded with a reference to the extreme importance of the chemical purity of the materials, not only of those used in the manufacture of the plates, but also of the acid, and even of the water used for filling up. In illustration of the paper specimens were shown which had been kindly lent by the D. P. Battery Company, the Electrical Power Storage Company, and the Tudor Accumulator Company.

THE INSTITUTE OF ARCHITECTS AND ARBITRATION.

WE are requested to publish the following correspondence:—

5, Arundel-street, Strand, W.C.
December 14, 1903.

To the President of the Royal Institute of British Architects, 9, Conduit-street, W.

DEAR SIR,—During the last few years we have been concerned in a large number of arbitrations which have taken place before gentlemen appointed by the President for the time being of your Institute.

It is, we need not say, of great benefit to litigants in the special class of cases which are the subject of such arbitrations to have an arbitrator with technical knowledge and practical experience.

There is, however, one aspect in which the result of these arbitrations have repeatedly produced grave dissatisfaction and, we may fairly venture to submit, grave injustice to litigants.

It has become and is a uniform practice amongst arbitrators appointed by your Institute to direct, whatever be the result of the arbitration, that each side shall bear its own costs and pay one half of the costs of the award. We do not deny that there may be cases in which such an order is fair, but the universal application must produce in many cases grave injustice. You are doubtless aware that in arbitrations conducted before the Official Referee of the Court, or before barristers of the highest standing, the practice is to order that the costs of the litigant who is subtantially successful should be paid by the party who improperly in the event forced litigation upon him. And this practice has a foundation in natural justice.

Suppose the case—a perfectly common one—where A. claims from B., say, 200*l.* B. will not pay, arbitration ensues. A. recovers say 180*l.* or 190*l.* The proceedings have, however, lasted a day or two, and A.'s costs amount to 120*l.* If an arbitrator directs under these circumstances that each side should pay its own costs and half the costs of the award, A., making an honest claim and establishing it, loses perhaps the whole of his profit on a contract, because B. improperly contests his claim.

In a case recently decided by an appointee of the President of the Royal Institute of British Architects, a claim of about 200*l.* was made on a contract of under 1,000*l.* The defendant not only denied liability for the 200*l.*, but counter-claimed for about 800*l.*, an amount almost equal to the contract figure. Every item was contested by the defendant, and on counsel's advice the plaintiff gave up a number of small items, although he entirely believed in his right to them, rather than multiply expense by pressing them. The case lasted four days by reason of the defendant disputing every item, and by reason of consideration having to be given to the counter-claim, which had no sort of solid basis. The award, after considering claim and counter-claim, found the plaintiff was entitled to 165*l.*—the difference between which sum and the sum claimed was largely made up of items abandoned under the circumstances above mentioned; nevertheless, the usual order as to costs made by members of your Institute was made. This means that the builder, though making a perfectly fair claim, has to derive no benefit from the arbitration, and has to lose his profit on the contract; although the responsibility for litigation having to be resorted to rests with the defendant.

This is not an isolated case. Very many instances could be brought to your notice of a similar description. Nor, we would especially have you understand, are we making any sort of complaint against the particular gentleman who sat as arbitrator in the case which we have instanced. His courtesy and ability and careful consideration of all points raised were most marked. It is the system we venture to criticise.

We have been and are much concerned with building arbitrations. We are not seeking in any way to attack the award in the case which we have mentioned. We feel, however, that the matter is one which we can fairly bring to your notice, and, if you think proper, you might give the subject your consideration, or even invite discussion amongst your members upon it.

We can honestly assure you that the present system is practically rendering useless the otherwise useful and valuable assistance of members of your Institute as arbitrators, and it is because we feel that sufficient consideration may not have been given to it, and that the matter is one of really public importance, that we have ventured to take the unusual course of inviting your attention to the question. Trusting that, in trespassing so largely upon your time, our motives may not be misunderstood, we beg to remain, sir, faithfully yours. BRABY AND MACDONALD.

19, Conduit-street, W.
January 11, 1904.

DEAR SIRS,—I am directed by my Council to say that they have given very careful consideration to your letter of December 14.

Assuming the facts to be as you state they quite agree with your argument; but they do not agree that it is at all a general practice on the part of the arbitrators to direct that each side shall bear its own costs and pay one half of the award.—I am, dear sirs, yours faithfully, W. J. LOCKE, Secretary.

Messrs. Braby and Macdonald,
Dacre House, Arundel-street, Strand, W.C.

SUNDERLAND TOWN HALL COMPETITION.—Mr. Jas. A. Swan writes that he believes the design mentioned in our review as that of "J. A. Watson" was really his, and that there was a mistake in the name. Our representative says that he read "Watson," but there may have been a mistake, owing to the notice or signature not being clearly written.

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ERDINGTON FREE LIBRARY COMPETITION.

We are requested to publish the following letter:—

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

March 4, 1904.

Competition for Erdington Free Library and Municipal Buildings.

DEAR SIR,—We are instructed by the Council of the Birmingham Architectural Association to express regret that the award of the professional assessor is proposed to be set aside, as such a course is unwarranted in this instance, and is prejudicial to the fair conduct of architectural competitions in the future.

The members of the Council are of the opinion that the design placed first by the assessor well merits its position, for the abilities shown in the compact planning, disposition of departments and economy. Clause 4, of the conditions issued to competitors, states that the work would be given to the author of the design placed first by the assessor, subject to his qualifications being, in the opinion of the assessor and Council, sufficient to warrant his being given the work.

Messrs. Ashford and Gladding are Associates of the Royal Institute of British Architects (by examinations 1893 and 1894), which alone is sufficient guarantee that they are capable of carrying out the work successfully.

Utmost fairness cannot be too strongly urged for competitors in public competitions, and very grave objections should be brought forward before the professional assessor's award is thrown aside.

Many members of the Council of the Birmingham Architectural Association, although unsuccessful, are quite in accord with the assessor's verdict.

A copy of this letter has been sent to the local papers.—Yours truly,

G. H. VERNON CALE,
GERALD MCMICHAEL,
Hon. Secs. Birmingham Architectural Association.

The Borough Surveyor, Erdington.

COMPETITIONS.

NEW COTTON EXCHANGE, LIVERPOOL.—We understand that on the 15th inst. drawings are to be sent in for the competition (limited to Liverpool architects) for the new Cotton Exchange at Liverpool, to cost 130,000*l*. Mr. Briggs, of Liverpool, is the assessor.

METHODIST COLLEGE, MANCHESTER.—In the limited competition for extensions to the Primitive Methodist College, Alexandra Road, Manchester, nine sets of drawings were submitted. The Committee appointed Mr. Henry Hartley, of Liverpool, as assessor, and he awarded the premiums as follows:—First premium, 50*l*., Mr. F. W. Dixon, of Trevelyan-buildings (Manchester); second premium, 30*l*., Messrs. Grayson and Ould (Liverpool); third premium, 20*l*., Messrs. Ewan Harper and Brothers (Birmingham); fourth premium, 15*l*., Messrs. Sankey and Cubbon (Manchester); fifth premium, 10*l*., Mr. W. H. Dinsley (Chorley). The College Committee approved the assessor's award and have instructed Mr. Dixon to proceed with the work. The cost will be about 18,000*l*.

NEW FREE LIBRARY, CLITHEROE.—A joint meeting of Clitheroe Town Council and the Free Library Committee was held in the Town Hall recently, at which the plans for the new Carnegie Library, prepared by Messrs. Butterworth and Duncan, Rochdale, and Mr. Sandbach, Blackburn, were reconsidered, when those of the former were accepted. The proposed structure is a building of Yorkshire dressed stone in the Renaissance style. The end facing Castle-street is a segment of a circle and carried forward at the top in the form of a tower, being 50 ft. high from the basement. At the top of the tower are three ornamental dormer windows. The building is three stories high from York-street. The entrance will be from Church-street, adjoining the present library. There will be a short vestibule giving access to a circular hall. From the entrance-hall, which also forms the borrowers' space, a staircase rises to the first floor, a landing giving access to the committee room and general reading-room. The latter will be fitted up with tables for the accommodation of readers, and at the tower end a circular room will be marked off by columns, forming a semi-private part for students. The architects give an accommodation for 15,000 books in the lending library; and the basement will be occupied as a work and store room, heating-chamber, etc.

MANCHESTER NEW INFIRMARY.—The Board of Management of the Manchester Royal Infirmary held a special meeting on Monday to receive the report of Mr. J. J. Burnet, of Glasgow, the assessor appointed to consider the plans submitted to them for the erection of a new Infirmary on the Stanley-grove site. The Board selected twelve architects or firms of architects, whom they invited to prepare designs for the proposed Infirmary, and Mr. Burnet's selection was in favour of a design marked "B." This proved to be the work of Mr. Edwin T. Hall and Mr. John Brooke, of London and Manchester. Accordingly the Board appointed Mr. Hall and Mr. Brooke joint architects for the building of the new Infirmary. The assessor, in his report, said that with trivial exceptions all the plans fulfil the "conditions of competition," and each might be said fairly to meet the requirements. "Without exception the designs are very carefully worked out, and it is only after repeated and most detailed examinations that I felt able to place first the design marked 'B.' I do so as it seems to me in the disposition of its buildings on the site, in the efficiency of each for its purpose, and in their contiguity to exhibit in a greater degree than any of the others that simplicity and directness which is characteristic of all good planning and is so necessary to efficient and economic administration, and to afford that openness to sunlight and air which is so important an element in such curative establishments. The architectural treatment throughout is essentially in harmony with the plan, broad and simple in its lines, and free from elaboration and extravagance in ornament. The frontage to Oxford-street shows a dignified and imposing building, characteristic of its purpose and site, and essentially worthy of your city. Your surveyor, Mr. Windsor, has examined the drawings, the author's report and his cost, and reports to me that the execution of this scheme will entail an expenditure of 324,000*l*., with an additional 16,500*l*. if the full 600 beds are provided." The Stanley-grove site consists of about twelve acres, and the new Infirmary will have a frontage to Oxford-road of about 500 ft., with Union Chapel on its south side and the Eye Hospital on the north. The institution will contain some 20 wards and about 600 beds. In style, says the *Manchester Guardian*, the buildings designed by Mr. Hall and Mr. Brooke are of classical composition, and the Infirmary itself is planned upon the pavilion principle. The front of the new Infirmary will consist of three blocks, that in the centre being surmounted by a dome and clock similar to those which adorn the present building, and the side blocks each having a tower. The building in the centre will be devoted to administrative purposes; on the south will be the nurses' home (containing about 300 beds), and on the north the teaching department. Behind these three blocks long "surgical" and "medical" corridors will run east and west, with pavilion wards ranging from them. The wards are to be of two stories, but will be so constructed that a third story may be added, if necessary, at some future time. Attached to the surgical wards are the necessary operating theatres. The remaining portion of the irregular area is devoted to some other important departments of the work of the Infirmary. The out-patients' department is to be a separate building, with a frontage into Nelson-street (behind the Eye Hospital). Here also will be the entrance to the casualty ward, and on this side, too, will be the eye, skin, and ear wards and the gynecological wards. The pathological department will be situate on the south of the Infirmary buildings. All the designs submitted to the assessor will be exhibited to the public in the course of the next few weeks at the City Art Gallery. In appointing Mr. Hall and Mr. Brooke their architects the Board reserve to themselves the right to alter or vary the plans, so that the design now under consideration is not necessarily the one which will be adopted eventually.

GLASGOW BUILDING TRADES EXCHANGE.—On the 2nd inst., in the Exchange, Colonel Bennett delivered a lecture to the members and friends on "A Tour in Italy." The lecturer confined himself principally to dealing with the architectural features of the various Italian towns visited. He devoted himself especially to a detailed description of St. Mark's, Venice. The lecture was illustrated by a large number of photographs of the subjects dealt with, which were displayed by lime-light.

ROYAL COMMISSION ON LONDON LOCOMOTION.

AT the sitting of this Commission on Thursday last week, evidence was given by the inventor of the mono-rail, Mr. F. B. Behr. He said that it appeared to him that the creation of a central authority not only to regulate the traffic itself, but to determine what class of railways or tramways, or what streets, should be built, was of the utmost importance in view of many mistakes which had already been made in the designing and providing means of communication in London in the past. As an instance he mentioned the tube railways already authorised and partly constructed. In many places those tubes duplicated each other for considerable distances, at an enormous cost and waste of capital. One instance was in the City, from Moorgate-street to Finsbury, and another was the case of the Waterloo and Baker-street line, and the Charing-cross and Hampstead line, which for more than a mile ran within an average distance of half-a-mile of each other. He considered that the enormous sums spent on tubes might be more advantageously employed on the construction of overhead railways. The great prejudice against overhead railways in London was due principally to the idea that they were very ugly and would disfigure the streets. Certainly in some places—New York was one—they had been designed in a very ugly manner. Overhead railways had been built on the Continent, however, which, instead of disfiguring the streets, had, in many cases, "added new features of architectural beauty to them." He mentioned Berlin as an instance, and in order to show the Commission the effect of such railways, he submitted for their inspection a set of photographs of the overhead railways in that city. It was quite possible to design overhead railways on lines running at the back of houses, and not in the centre of the streets; this had been done in Berlin in some instances, and such a system would be quite possible in some part of London, and would not cost more than 200,000*l*. a mile. Overhead railways had the advantage of being in the open air. He had designed two lines of mono-rail for London. One, 12 miles in length, would be from East to West, through North London; starting from the Royal Oak, by Edgware-road, and proceeding through St. John's Wood, Camden Town, King's Cross, Islington, Haggerston, and Hackney to the Albert and Victoria Docks. There would be three branch lines of a total length of 5 miles 5 furlongs; one from the Royal Oak to Willesden Junction, another from Haggerston to Old Broad Street, and another going by Stepney to Limehouse. He submitted plans and sections, &c., of these lines, which would, he estimated, cost 100,000*l*. per mile. Another line of mono-rail which he had designed would start from the Houses of Parliament, and, proceeding along the Chelsea Embankment, would terminate at Putney Bridge Station. Mono-railways had many advantages, among them being cheapness, the possibility of passing under existing road bridges in many cases, the use of very sharp curves without much friction, and the absolute impossibility of derailment.

Mr. Francis Fox, of the firm of Sir Douglas Fox and Partners, was the next witness. He said that he was a member of the technical commission of experts for the Simplon Tunnel through the Alps, and had had a large experience in tunnelling. He was strongly in favour of shallow tunnels or subways where the conditions permitted, as they were more accessible for the public, required no lifts and comparatively few steps, and were more easily ventilated. Under new and very wide streets such subways would be satisfactory, but he strongly deprecated the proposal to construct them under existing thoroughfares in the metropolis on account of the great danger to adjacent property. London stood on alluvial deposits which rested on a bed of gravel and sand, and these rested on the great bed of London clay. In consequence of that formation all water falling on the surface, except that conveyed direct to the sewers, and all natural springs penetrated through the sand, and ran in underground streams of varying depth upon the upper surface of the London clay. If shallow subways were constructed they would be almost wholly in that bed of sand and gravel. Adjacent property would have to be undermined down to the clay, and the entire system of sewers and house drainage would have to be reconstructed. The pumping in inevitably results in the drawing away of sand from beneath adjacent property, and that would result in varying degrees of damage. An illustration of this was at St. Paul's Cathedral, and another occurred during the construction of the Park branch of the Mersey Railway at Birkenhead. It was to obviate such effects that the late Mr. Greathead adopted the

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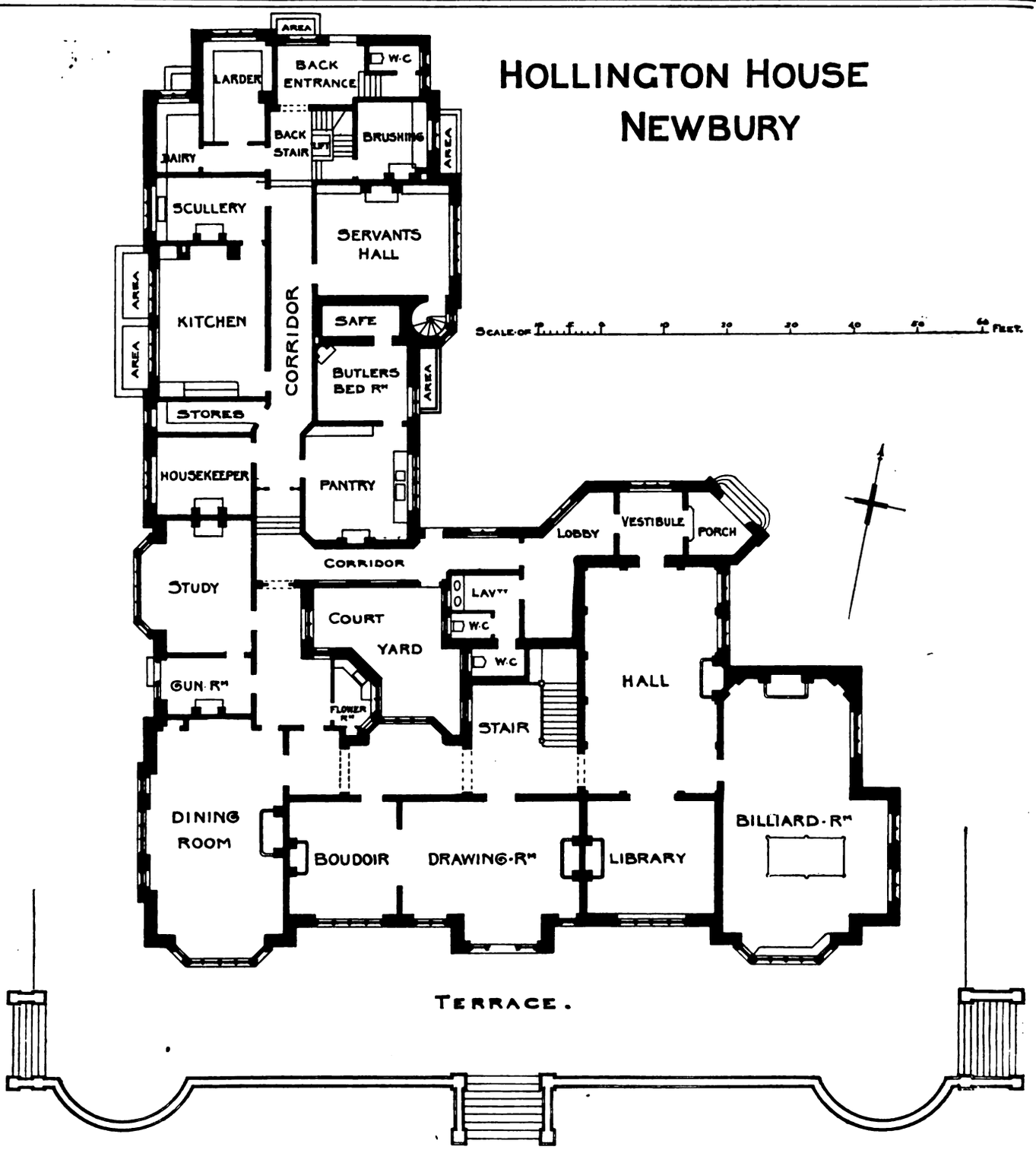

system of deep-level tubes in the clay. To abandon the tube system for shallow subways would, in his opinion, be a retrograde step. Dealing with the question of the ventilation of tubes witness said that to ensure healthy ventilation the entire air in a tunnel should be changed every hour during the periods of dense traffic. Coming to the question of the prevention of fire and panic on tube railways, he outlined what had been done in this direction on the new Great Northern and City Railway, and the various other London tubes, and said that most of the necessary precautions had been adopted before the recent fatal fire on the Paris Underground Railway. One point he wished particularly to emphasise—the covering of all leads and circuits should be of some non-flammable material, as gutta-percha when fired produced dense volumes of smoke.

MEMORIAL STATUE, HEXHAM.—On the 29th ult., the Benson statue, to the memory of the late Colonel G. E. Benson, R.A., was placed in position on the carved stone pedestal at the top of Beaumont-street, Hexham. The statue is a bronze figure, and represents the deceased in the African, or khaki, uniform of a colonel, holding in his hands a pair of field-glasses. The sculptor is Mr. John Tweedy, of Chelsea.

Illustrations.

NEW BUILDINGS AT CAMBRIDGE.

WE give, on a large scale, the street and court elevations of Mr. T. G. Jackson's long range of new buildings in Downing-street for the University of Cambridge, which were partly the subject of an article in our last issue. We should have preferred to have published the illustration in the same issue, but it was not convenient to disturb arrangements which had already been made for that week's illustrations.

The drawings are elevations made before the buildings were carried out, but as far as we noticed, there is no departure from the design shown here except in the detail of the sculptured animals at the foot of the external staircase, which, as indicated here, are different from those actually executed.

HOLLINGTON HOUSE, NEAR NEWBURY.

THIS house is quite new throughout, and stands on the site of the original house of the same name—viz., a small cottage residence which had been added to by an amateur architect some years ago and was totally unfit for further enlargement or improvement. The new house is built of Guiting stone, the principal front and entrance wing being relieved by piers of red brick, of which material the chimneys also are built. The stone dressings to windows are of Taynton stone, and the roofs are covered with local tiles which have been dipped in a special solution to give them a brown colour.

The north-east wing of the house is treated in a less formal style, and a liberal use has been made of oak half-timber work and rough-cast plaster. The principal rooms on the ground floor are panelled with oak, and a feature is made of the entrance-hall, which is carried to the height of the first-floor ceiling. A gallery is carried across the end and above the oak panelling, which extends up to the gallery front; the walls are treated with plaster panels, and the ceiling is divided into bays by ribs with fruit and flower enrichment. There is ample cellar-room under the north-east wing, in which are situated the heating apparatus, wine and beer cellars, coals, and lumber-rooms. A subway is provided under the principal corridors, in which are placed the electric cables and heating supplies, etc. The house is lit by electricity, and there is an electric lift for luggage and coals.

The work has been carried out by Messrs.

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Wheeler Brothers, of Reading, under the supervision of Mr. S. Windebank, clerk of the works. The engineering works have been designed and carried out under the superintendence of Mr. E. Wingfield Bowles.

ARTHUR C. BLOMFIELD.

GALLERY AND BALL-ROOM.

THIS room forms a portion of additions made to a large Yorkshire mansion, and serves the purpose of providing additional accommodation for entertainments as well as for the display of valuable pictures.

All the woodwork—including the floor—is of fumed Austrian oak. The walls above the dado are covered with Tynecastle tapestry with raised pattern and painted green.

The carving of the woodwork was done by Mr. Ralph Hedley, of Newcastle-on-Tyne, and the ceiling by Messrs. G. Jackson and Son, of London.

The architects are Messrs. Clark and Moscrop, of Darlington.

A TOWN HOUSE.

THIS house was designed with a view to making a slight departure from the ordinary London house. The front door becomes the central feature of the elevation, leading to a large entrance-hall, while the dining-room is raised to the first floor, to bring it to the same level as the drawing-room. The drawing was exhibited in the Royal Academy in 1898.

E. W. ALLFREY.

PREMIATED HOUSES IN PARIS.

A CORRESPONDENT in Paris writes to say that the arrangement of the kitchen and water-closet in the plan of M. Hodanger's flats, published in our issue of February 27, is not exactly as the plan makes it appear. The water-closet is not lighted by a borrowed light from the kitchen, but by a light from the court-yard, over a low cupboard not the whole height of the kitchen. This is better, no doubt, than the apparent arrangement; it is to be hoped that the window is made to open; but in any case the proximity of the water-closet door to the kitchen door, in a confined corner of the plan, would be strongly condemned by English sanitarians.

BOOKS RECEIVED.

THE ROCK-CUT TOMBS OF EL AMARNA. By N. de G. Davies. Thirteenth memoir of the archæological survey of Egypt. (Kegan Paul, Trench, Trübner, & Co.)

STAINED GLASS. By Lewis F. Day. (Chapman and Hall. 4s.)

Correspondence.

WOODEN BUILDINGS IN LONDON.

SIR,—On page 254 you review the year-book of the Incorporated Association of Municipal and County Engineers, in which is a paper on wooden structures and the powers of Metropolitan Borough Councils. I cannot help thinking that Mr. J. Patten Barber has taken the wrong view of this question.

It is unfortunate that the London Building Act omits the definition of a "building," but the sole cause of all the trouble of which Mr. Barber complains is the absurdity of taking one section out of the Building Act. In the hands of the Borough Council local influence may secure a licence which a central body would refuse, and nothing could be worse for the public than the multiplication of wooden buildings.

My view is that no wooden buildings should be licensed, and that the new Building Act should require (as was the case with sky-signs) that all wooden structures should be removed within two years of the passing of the Act. In some neighbourhoods the gardens and back-yards are so covered with shanties that some day there will be a very serious fire.

Instead of making the erection of wooden buildings and structures more easy, I would make it more difficult, and to that end would suggest the repeal of the absurd section of the London Government Bill.

SURVEYOR.

THE TORQUAY LIBRARY COMPETITION.

SIR,—In reference to your note in to-day's issue of *The Builder* relative to the Torquay Library Competition, I should like to say that I, too, received the circular, dated February 17, referred to by your correspondent, also many days after the date at the head of the circular and within about a fortnight of the expiration of the time allowed for completion of the drawings. The information in the clause about windows was given to me under date January 5 in answer to inquiries I made under date December 18, and, of course, ought to have been sent to all other competitors on the same date. By this circular of February 17 date, we are also coolly told that the Assessor considers that the accommodation asked for cannot be given for the money allowed, but that "in the consideration of the designs he will give great weight to those which show, by their economy of arrangement and design, the nearest approach to the figure given in the conditions."

To draw up conditions which cannot, by any possibility, be genuinely fulfilled is both unfair to competitors, and shows a lamentable want of consideration for the architectural profession generally, and to fire off bomb-shells of the nature of this circular at the competitors within a few days of the time for sending in drawings does not relieve those responsible from blame in this connexion.

From a careful study of the replies I received, and from all the other information furnished to competitors, I concluded that the Corporation had not bestowed sufficient consideration on the business to insure a satisfactory result either to themselves or to competitors, I therefore refrained from wasting my time on the work, and hope that few of my professional brothers have been beguiled into sending in designs, and that the Corporation will get that for which they have made preparations—viz., a muddled-up building in accordance with the muddled-up requirements.

The site is, to my mind, quite unsuitable for a Library and Municipal Offices, flanked as it is on one side by a towering furniture depository, which will constantly menace with destruction by fire the valuable books of the library and records in the Municipal Offices.

The moral of all this is, that those about to promote competitions should, as the "Suggestions," etc., of the R.I.B.A. say, "appoint as Assessor one or more architects of established reputation" as their very first step, and that these Assessors should not only report on the relative merits of the designs, but also draw up the conditions upon which the designs are to be based.

The only way to force promoters to do this is for architects to abstain from competing when this course is not pursued; while, at the same time, every effort should continue to be made by the R.I.B.A. and the Competition Reform Society to bring about a better way of managing competitions than too often obtains at present.

W. B. HOPKINS.

London, March 5.

[**** See our Note on page 276: from which our correspondent will see that the committee have acted without consulting the assessor.—ED.]

The Student's Column.

ARCHES.—XI.

ANOTHER arch theory, based on the hypothesis of least thrust at the crown, is that of Dr. Scheffler,* in which, however, no account is taken of the horizontal components of the external forces.

This theory does not, as is sometimes stated, assume that the stones forming the voussoirs of the arch are incompressible. It is true that, as developed by Scheffler, the theory gives the position of the line of pressures for incompressible voussoirs, but its author recognises the fact that compression of the material affects the line of resistance so that it will be diverted towards the centre line at points where it would otherwise be in close proximity to the outer boundary of the arch ring.

For the purpose of illustrating the application of this theory, we will take, as an example, a segmental arch, of which the left-hand half is shown in Fig. 54. The span of the entire arch is 50 ft., with a rise of 10 ft. The voussoirs have the uniform depth of 2 ft. 6 in., and the arch is surmounted by a masonry spandrel wall, the top of which is 2 ft. 10 in. above the crown. In the determination of the line of resistance for this arch we will follow the exposition of Scheffler's theory, as given in Cain's "Practical Theory of Voussoir Arches."

Dealing with the semi-arch, represented in Fig. 54, it is necessary to ascertain the value and point of application of the resultant of the external forces acting upon portions of the arch above the joints, considered successively from the crown to the springing. It is assumed that the lengths of the voussoirs have not been settled. Therefore, for the purpose of the present demonstration, we divide the half span of 25 ft. into five equal portions, as shown in the diagram, and draw tentative radial joints through the points A, B, C, D, E, and F.

The load on any part of the arch is then assumed to be proportional to the area immediately above it. For instance, the load on K C B J is assumed to be proportional to the area N S T O.

It should be observed, however, that the load on the joint C K is actually K C S T B J, and not N S T O. The amount of the error varies with the form of the arch, being at a minimum near the crown of a flat segmental arch, and at a maximum near the springing of a semi-circular arch.

Scheffler gives the following approximately accurate method for altering the positions of the joints to correct errors of the kind here mentioned:—

Let A B C, Fig. 55, be the side of the trapezoid, and B D the uncorrected joint. From *c* midway between C and D draw the line *c* A; also draw C *b* parallel to *c* A, and *b d* parallel to B D. Then *b d* will represent the corrected joint. The error would also be eliminated by determining the separate weights of C S T B and K C B J, in Fig. 54, and combining them into a single resultant for the weight on the joint C K. Or, by drawing the arch to a large scale on cardboard, then cutting out the various polygons which represent the loads, the amount of the latter could be determined from the weights of the corresponding sections of the cardboard, and the centre of gravity of each section could be found experimentally.

When the areas representing the loads have been determined, it is necessary to find the values of the several loads and the distances of their centres of gravity from a vertical line drawn through the crown of the arch, and also to ascertain the values and positions of the centres of gravity of the loads above the several joints.

Table II. gives the data necessary for these operations. The lengths of the medial lines of the several trapezoids are given in the column 1 of Table II. In column 5 are the products of the values in columns 3 and 4. Column 6 gives the continued sums of the quantities in column 3; column 7 the continued sums of the quantities in column 5; and the figures in column 8 have been arrived at by dividing the quantities in column 7 by the corresponding quantities in column 6.

TABLE II.—FOR THE APPLICATION OF SCHEFFLER'S THEORY.

No. of Division of Arch.	Values and Positions of the Centres of Gravity of the Loads.				Data for Values and Centres of Gravity of the Loads over the Several Joints.			
	Dimensions of the Sections.			Horizontal Distance of Centre of Gravity of each Section from .	Moments of each Section, about *a*.	Area of the Load above the Joints.	Moments of the Loads over the Joints, about *a*.	Horizontal Distance from *a* to the Centre of Gravity of the Loads over the Joints.
	Height.	Width.	Area.					
1	5·4	5	27·0	2·5	67·50	27·0	67·50	2·5
2	6·1	5	30·5	7·5	228·75	57·5	296·25	5·1
3	7·6	5	38·0	12·5	475·00	95·5	771·25	8·1
4	9·8	5	49·0	17·5	857·50	144·5	1,628·75	11·3
5	13·2	5	66·0	22·5	1,485·00	210·5	3,113·75	14·7
6	14·5	1·75	25·4	25·9	657·86	235·9	3,771·61	16·0
Col.	1	2	3	4	5	6	7	8

* "Theorie der Gewölbe, Futtermauern, und eisernen Brücken," Brunswick; and "Traité de la Stabilité des Constructions," Paris.

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The next step is to determine the least crown thrust, which being applied at *a*—the upper limit of the middle third of the crown joint—will be sufficient to insure the safety of the semi-arch from failure by rotation. The centre of moments for each joint is taken to be situated on the lower boundary line of the middle third of the arch ring.

Then to insure equilibrium about any joint

$$Q = W x \div y$$

Where Q = horizontal thrust at the crown; y = the arms of the horizontal thrust; W = the load above any joint; and x = the arm of the load W.

The value of W for each joint is given in column 6 of Table II., in terms of the weight of one cubic foot of the masonry. The value of x for any joint is the horizontal distance between the resultant of the load above the joint and the centre of the moments for the joint; and to find the value of x for any joint, shown in Fig. 54, we must first take the horizontal distance between *a* and the centre of moments, and then deduct the horizontal distance between *a* and the centre of gravity of the load above the joint under consideration, the latter distance being stated in column 8 of Table II.

The required quantities for the value of x are stated in Table III., the first in column 2, the second in column 3, and the difference in column 4.

TABLE III.—FOR THE APPLICATION OF SCHEFFLER'S THEORY.

No. of Joint.	Area of the Load above each Joint. (= W)	Horizontal Distance from *a* to the Centre of Moments for the Joints.	Horizontal Distance from *a* to the Centre of Gravity of the Loads over the Joints.	Area of the Load about the Centre of Resistance of the Joints. (= x)	Area of the Thrust about the Centre of Resistance of each Joint. (= y)	Horizontal Thrust required to Prevent Rotation about the Joints. = Q
1	27·0	4·8	2·5	2·3	1·15	54·0
2	57·5	9·6	5·1	4·5	2·09	123·6
3	95·5	14·4	8·1	6.3	3·72	116·9
4	144·5	19·2	11·3	7·9	6·16	185·3
5	210·5	24·0	14·7	9·3	9·60	204·0
6	235·9	25·6	16·0	9·6	11·00	205·9
Col.	1	2	3	4	5	6

The values of y for the several joints are given in column 5, of Table III., and the values of the horizontal thrust required to insure safety against rotation about the several joints, can be obtained by the formula given above after substitution of the foregoing data. These values are stated in column 6 of Table III., where it will be seen that the maximum horizontal thrust is at joint No. 6, which consequently is the joint of rupture. This position of the joint of rupture is only what might have been expected (see Article X., p. 258), as the angular distance of joint No. 6 from the crown of the arch is little more than 43 degrees.

The final step is to construct the line of resistance for the semi-arch. For this purpose it is first necessary to find the centre of pressure on joint No. 1, the joint next to the crown, in the following manner:—Draw a horizontal line through *a* and lay off a distance *a b*, representing, to any convenient scale, the horizontal distance from the point *a* to the centre of gravity of the load above joint No. 1, taking the value of this distance from column 3, Table III. The point *b* is that through which acts the weight of the section O T U I, approximately equal to that of J B T U I. Next, lay off from *b*, also to a convenient scale, the vertical line *b c*, representing the superincumbent load, or, in other words, the area of the load above joint No. 1, taking for this the value stated in column 1, Table III. Then lay off from the point *c*, the line *c d* representing the value of Q, the horizontal crown thrust required to insure safety against rotation, taking the necessary quantity from the bottom line of column 6, Table III. Connect the points *d* and *b*, and, in accordance with mechanical principles, the line *d b* will represent the resultant pressure on the first joint B J. By producing the line *d b* to intersect the joint B J, we find the point *e* to be the centre of pressure for that joint.

The centre of pressure for the second joint is found by laying off from *a*, the horizontal distance *a f* representing, to the same scale as before, the distance from the point *a* to the centre of gravity of the load above joint No. 2, taking the value from column 3, Table III. Lay off from *f*, to the scale previously used, the vertical line *f g*, representing the weight of the superincumbent loads above joints Nos. 1 and 2, taking the value from column 1, Table III. From the point *g*, lay off the line *g h*, representing the value of Q, the horizontal crown thrust, taking the necessary quantity, as before, from the bottom line of column 6, Table III. Connect the points *h* and *f*, completing the triangle of forces, and the line *h f* will represent the resultant pressure on the second joint C K. Producing the line *h f* to intersect the joint C K, we find the point *j* to be the centre of pressure for that joint.

Following a similar course, we obtain the triangles of forces:—*k l m*, *o p q*, *s t u*, and *w x y*, giving the centres of pressure for the succeeding joints. A line joining the centres of pressure *a e j n r v* and *z* would be the line of resistance of the arch, but this is omitted from the diagram for the sake of avoiding confusion.

Having thus determined the line of resistance, the stability of the proposed arch can be considered in the manner discussed in Article IX., pp. 229-230.

The above described method of constructing the line of resistance is simple and convenient, but its adoption involves the assumption that the external forces are vertical, which we know is not a correct hypothesis.

The student will find it instructive to compare the lines of resistance for the semi-arch represented in Fig. 47, p. 229, (1) as afforded by Scheffler's theory, and (2) by the theory described in Article IX.

On p. 229 we have an equilibrium polygon for the arch in question, and from this it is easy to draw the line of resistance, which we have indicated in Fig. 56 by continuous lines.

A line of resistance should then be constructed in accordance with Scheffler's theory, disregarding the horizontal components of the external forces, and taking the necessary data from Table I. After laying off the crown thrust and the loads as given in the table, the remainder of the construction is similar to that explained in Article IX. The line of resistance so obtained is indicated in Fig. 56 by broken lines.

Comparison of the two lines of resistance shows that they are fairly in agreement above the joint of rupture for this particular arch, whereas the divergence is considerable below that joint, and increases as the springing is approached. It follows, therefore, that if reliance be placed upon Scheffler's theory, the thickness of the arch at the springing must be greater than that which is required by the other theory. As a matter of fact, the thickness will be greater than is actually necessary.

It should be observed that in taking the value of the crown thrust from Table I., the correct quantity for employment is the maximum value on the fourth line of the column headed $\Sigma\ w\ x \div y$. This is the thrust that would establish a condition of equilibrium about the joint of rupture, which we already know to be joint No. 4. If the quantity on the last line of the same column were employed, the erroneous result would be obtained that is indicated by the dotted line of resistance, in Fig. 56, tangent to the intrados, a condition absolutely incompatible with stability. But such a line of resistance would be entirely wrong, for we have already proved the arch to be perfectly safe. The point is worthy of careful attention, as the erroneous method here indicated necessarily tends to heavy and wasteful construction.

METROPOLITAN ASYLUMS BOARD.

THE usual meeting of this Board was held on Saturday last week at the Offices, Victoria-embankment. Among the correspondence received was a letter from the Local Government Board approving of the amended plans of the laundry buildings, disinfector and destructor houses at the Southern Hospital.

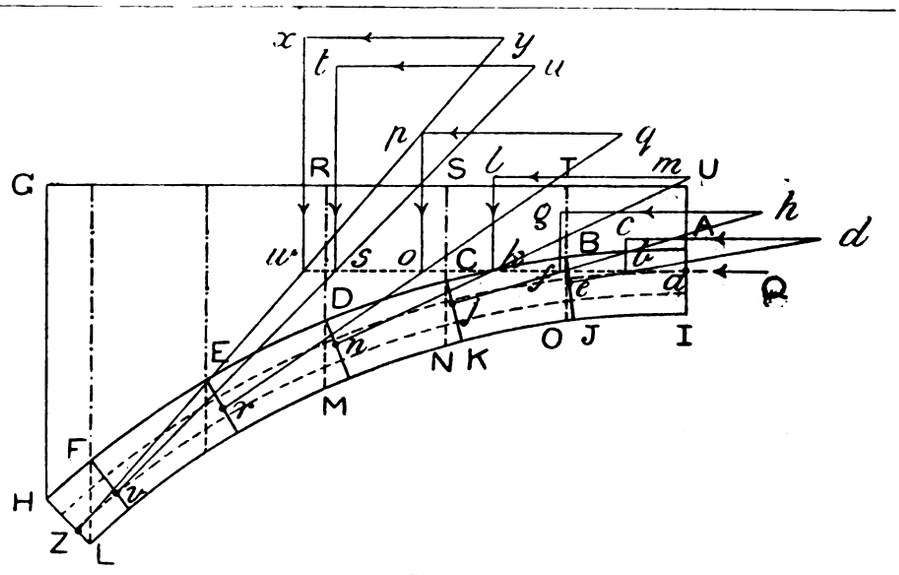

Fig. 54.

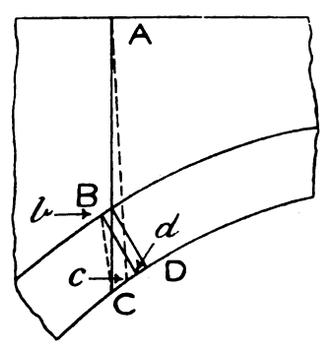

Fig. 55.

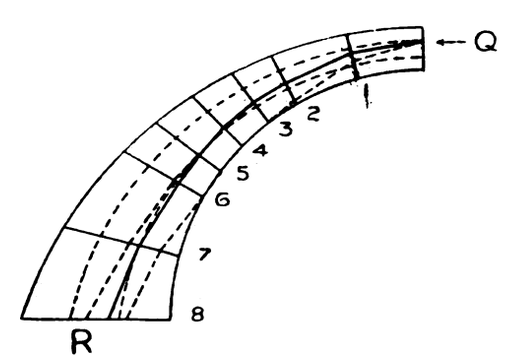

Fig. 56.

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Eastern and Western Hospitals.—On the recommendation of the Works Committee, it was agreed to make application to the Local Government Board for sanction to the Managers inviting tenders for wiring the Eastern and Western Hospitals for electric-lighting purposes. Six firms will be selected.

Joyce Green Hospital.—On the recommendation of the same Committee, the following was agreed to:—"That the quantity surveyor who took out the quantities relating to Messrs. Leslie and Co.'s main contract for the erection of the Joyce Green Hospital be called upon to pay the Managers the sum of 775*l.* in settlement of the errors which he has made in such quantities."

OBITUARY.

DR. A. S. MURRAY.—It is with the greatest regret that we have to record the death, after a comparatively short illness, of Dr. A. S. Murray, the learned archæologist and keeper of the Greek marbles at the British Museum. Dr. Murray, it is to be feared, was a martyr to his own strict sense of duty in fulfilling obligations entered into. He had engaged to give four lectures on ancient sculpture at the Royal Academy, but at his third lecture, on February 22, his friends noticed his evident weakness and difficulty in reading, and he admitted that he did not feel fit to be out at all; and medical advice, had he asked for it, would probably have kept him at home that day; but he knew little of illness, having never, we believe, been absent from his duties for a day through illness during his whole long course of connexion with the Antiquities Department of the British Museum. His effort on this occasion unhappily brought on an attack of pneumonia, from which he died, in his house in the British Museum, on Saturday last. Dr. Murray was born in 1841, near Arbroath, in Forfarshire, and educated at the Edinburgh High School and University, and was subsequently a student of the Berlin University, where he acquired the familiarity with the German language and German methods of study which is now all but a necessity to Greek archæologists. It was in 1867 that he was appointed assistant to Newton in the Greek Antiquities Department of the British Museum, with which he was connected for the remainder of his life, succeeding Newton as the head of the department. Dr. Murray did a great deal in the way of rearranging the Greek marbles so as to add to the significance of their grouping. His most marked achievement in this respect was his decision to place the figures of Mausolus and Artemisia in the restored chariot in the middle of the mausoleum; a decision which was strongly criticised by various Greek archæologists, and was the subject of an animated discussion at one of the meetings of the Hellenic Society, where he read a short paper giving his reasons for the course he had taken. We believe that he was right, and that the two statues now occupy the position they actually occupied when on the top of the mausoleum. Dr. Murray's main work in life really consisted in his management of the British Museum Greek department, but he found time to write a "History of Sculptures," a "Handbook of Greek Archæology," and a book on the sculptures of the Parthenon. These books, the "History of Sculpture" especially, are valuable rather for the care for accuracy with which they were compiled than for literary style, which was not his *forte*. He told what he knew in simple and unadorned language; and his lectures had the same character; they were intended to give information, not to amuse a popular audience; and, in fact, we have seldom heard any discourses more full of solid information in proportion to their length than these four recent Academy lectures. His lectures, however, were not without an occasional flash of quiet humour, which gained additional effect from the Scotch accent which he had never lost. Dr. Murray was the most modest and unassuming of *savants;* there was nothing of the learned pedant about him; he retained always a certain simplicity and boyishness of manner, and was a genial companion and a warm friend; and his information about the museum collection and about Greek antiquities generally was at the service of all who asked for it. Dr. Murray has been an occasional contributor to our own columns, and had, in fact, promised us an article on a special subject as soon, he said, as the Academy lectures were off his hands: a promise destined never to be fulfilled.

MR. SAMUEL QUICK CLEMENCE.—Mr Clemence, who died at Horley, in Surrey, on the first of this month, in his eighty-fifth year, though living in retirement the last few years, was well known for quite half a century to most of those following the building business in the Metropolis in connexion with the late firm of Messrs. Kelk and Lucas and Messrs Lucas Brothers, and with the work which they have executed there and in various parts of the kingdom. Entering their service in 1845, he continued with them until they retired from business about ten years ago, and during a period of nearly fifty years he had the entire charge of most of their large contracts, and his thorough practical knowledge of every branch of the building trade is evidenced in the works which he superintended and carried out for them. Among other things, we may mention that the timber framework upon which the domes of the 1862 Exhibition were built was entirely designed by him, as also the travelling centres or scaffoldings for the nave and transept roofs. Of the dome centring he had a large model made, which may now be seen in the Museum of Models at Woolwich Arsenal, to which it was presented.

MR. J. W. TWIST.—Mr. J. W. Twist, architect, of Bloemfontein, has died suddenly on the farm Weltevreden, where he had been residing for his health.

GENERAL BUILDING NEWS.

CHURCH OF ST. PAUL, FAIRHAVEN, NEAR MANCHESTER.—The consecration of the new Church of St. Paul, Fairhaven—the watering-place between St. Anne's and Lytham—took place on the 29th ult. The church is intended to hold ultimately 800 worshippers. To the south of the chancel is a side chapel for week-day services, but sufficiently open to the nave to be used for Sunday services. To the south of the chapel are large vestries, with an adjacent porch. The organ loft is north of the chancel, and the hydraulic engine for the bellows is in the basement below. The altar is raised seven steps above the nave floor. The building is of red brick, relieved here and there outside by panels of split pebbles from the beach, as well as by the use of stone both outside and in. The roofs are covered with deep green north country slates. The church now consecrated consists of chancel, south-east chapel, vestries, organ chamber, south nave and south aisle, west and south-east porches, and the lower stages of the tower, and will seat 422 worshippers. Mr. John Walmsley, of Preston, has carried out the work under the direction of the architect, Mr. Medland Taylor, of Manchester.

RESTORATION OF SINNINGTON PARISH CHURCH.—The restoration of Sinnington Parish Church is now in progress under the direction of Mr. Hodgson Fowler, the architect. All the ancient features will be preserved. The church will have a new spire and a red-tiled roof. The contractor is Mr. Alfred Barnes, of Malton, and Mr. Nicholson, of Barton-le-Willows, is carrying out the woodwork. The restoration of the church and organ will cost about 1,200*l.*

WESLEYAN SUNDAY SCHOOL, WHITTINGTON MOOR.—The foundation stones of a new Sunday School for the Wesleyans were laid at Whittington Moor recently. The site faces the Chesterfield and Staveley road, and is situate in the cross street that connects the latter thoroughfare with the Sheffield road. The architect is Mr. W. Cecil Jackson, Chesterfield, and the contractor is Mr. J. Wright, of Barlow. On the ground floor will be a church parlour, a young men's room, and four class rooms, together with a kitchen and the usual conveniences. The assembly-room will occupy the whole of the first floor, and will provide accommodation for 300 persons.

CONGREGATIONAL SCHOOLS, PEMBERTON.—The opening of the Richmond Hill Congregational Church School, Pemberton, took place recently. The new buildings have been carried out in red brick and stone, and contain, amongst other features, a central hall, designed for both services and school purposes, entered from a vestibule, with two inner vestibules, which can, if desired, be used as cloak-rooms. At each side there are lecture-rooms and class-rooms. The lecture-rooms are partitioned off from the main hall with movable screens, so that these rooms can be made to form part of the hall, and with three class-rooms on each side, together with ministers' vestry and tea-room, comprise the ground floor, with the usual conveniences for boys and girls. The building is lighted throughout by electricity, and is also heated by hot water from boilers in basement, which work has been carried out by Messrs. Crumblehulme, of Bolton. The ventilation has been carried out by Mr. O. Pickup, of Bury. The contractor has been Mr. A. Bywater, of Pemberton, and the sub-contractors were:—Mason work, Messrs. Webster and Winstanley; plumber and glazier, Mr. Unsworth (Ashton); plasterer, Mr. Higham. The accommodation of the main hall is 450 adults, gallery seventy-five, lecture-rooms 100, being a total of 625 adults, exclusive of class-rooms. The work has been carried out under the supervision of the architects, Messrs. J. B. and W. Thornley, Wigan, Darwen, and London.

ST. EDMUND'S COLLEGE, WARE.—An extension is about to be made of the buildings of the Roman Catholic seminary for priests, at the Old Hall, Ware, for the accommodation of fifty theological students, together with the addition to the college church of a new chapel, after plans and designs by Mr. F. Walters.

TECHNICAL INSTITUTE, STOURBRIDGE. — The stone-laying ceremony at the Stourbridge Technical Institute and Carnegie Library took place on the 25th ult. The entrance to the Library and Art School is from Hagley-road, and to the Technical Institute from Church-street. Over the main entrance in Hagley-road, which is 10 ft. 6 in. wide, will be a panel representing art and literature. The rooms on the basement will afford accommodation for wrought-iron work, carpentry, etc., with provision for stores and heating apparatus. Four rooms range from 38 ft. to 40 ft. long and 21 ft. wide, and there are two rooms 21 ft. square as well. On the ground floor there will be a lending library 50 ft. by 21 ft., a magazine and reference library 40 ft. by 21 ft., a news room 38 ft. by 21 ft., a ladies' room 17 ft. by 13¼ ft., and also a librarian's office, book store, etc. The reference library has an octagon bay facing down High-street. The technical part of the building includes modelling room, casting room, cookery instruction room, and rooms for the caretaker. On the first floor of the building, which is reached by turning to the right from the main entrance, is the accommodation for the School of Art. There is an antique and painting room, a life room, an advanced room, an elementary room, and mechanical and cast rooms. Headmaster's room, committee room, lavatories, etc., are found on this floor. On the second floor will be rooms for science teaching, including lecture room, chemistry laboratory, physics laboratory, etc. Altogether there are twenty-six class rooms, together with rooms for caretaker, and other uses. The design of the building generally is classic, and the dressings and mullions are in buff terra cotta. The roof is to be of green Westmoreland slates. The gable, at the corner of Hagley-road and Church-street, will be surmounted by an ornamental ventilating turret, the summit of which will stand 80 ft. above the road level. Mr. F. Woodward, Town Surveyor, is the architect of the building.

DIAL HOUSE, NEWCASTLE-ON-TYNE. — New business premises, five stories high, have just been completed in Northumberland-street. The architects were Messrs. Oliver, Leeson, and Wood, and the contractor Mr. John Ferguson, Newcastle.

FISHERLADS' INSTITUTE, GRIMSBY.—The proposed additions to these buildings occupy an area of 300 sq. yds., being one-third of the area of the old buildings, extending the whole depth of the site from Orwell-street to Riby-street, and having a frontage in each street of about 30 ft. They comprise mainly two blocks, each of two stories. The Orwell-street block has on the ground floor two class-rooms; the front room is devoted to classes for engineers, the back room being fitted up with all the appliances for teaching sea cookery. The upper floor is occupied by a room for navigation classes and other subjects; it can also be used for meetings and entertainments, having a seating capacity of 160 adults, exclusive of the platform; a new lavatory will be built adjoining this room, opening from the landing. The Riby-street block has on the ground floor a laundry. It is to be equipped with modern machinery for dealing with the great number of towels and bathing-dresses from the slipper and swimming baths, as well as to meet the domestic requirements of the staff. The new slipper baths, seventeen in number, occupy a hall extending over the laundry and the engine-house. The surface of the floor and of the gallery adjoining will be of random marble mosaic. The slipper bath hall is approached through a swing door, opening from a new gallery in the swimming bath, having a range of dressing-boxes above and below. A new wide and straight stone staircase replaces the old wooden one. The old and the new buildings will be fitted throughout with electric light. The plans have been prepared by Mr. John J. Cresswell, architect, of Grimsby.

NURSES' HOME, CLAYTON WORKHOUSE, YORKSHIRE.—On the 2nd inst., at the Workhouse of the North Bierley Union at Clayton, the opening took place of a Nurses' Home, which has been erected by the Guardians in the Workhouse grounds, at a cost of 1,450*l.* The home affords accommodation for ten nurses, and has been built from the design of Mr. S. Spencer, architect, Clayton and Great Horton.

NEW WORKS AND OFFICES, LEEDS.—The new engineering works and offices of Messrs. Graham, Morton and Co., Leeds and London, were designed by Mr. Maurice Graham,

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managing director to the Company. The length of the offices is 270 ft., the width 41 ft. The site being a slope, advantage is taken of the slope at the lower end to provide a basement divided into several rooms used for subsidiary offices, mess-rooms, reading-rooms, and stores. The hot-water heating apparatus for warming the whole building is situated here. Light is admitted by windows just above the level of the pavement. With the exception of the basement offices, all are on one level. The main entrance hall is at the centre, dividing the building into two parts, that on the right containing the drawing office, with its various departments (estimating and inquiry, general, colliery, drawing store, and blue-print room). At the extreme end of the drawing office is the weigh office, immediately outside this being the weigh bridge and the works entrance. To the left of the main entrance are seen the inquiry office and waiting-room for callers; to the right and left of the corridor are the different offices. Those on the right comprise the telephone-room, block-storing room, typists' and filing room (the two latter separated from the corridor by a glazed screen), the managing director's room, the board-room, the publicity department office, and the representatives' office. Those on the left, following on from the waiting-room, include the general manager's office, the secretary's and the general clerical office (the last two being separated by a glazed partition, which permits eye-control), and the strong-room. Beyond the offices, and constituting the extreme left corner of the building, is the porter's lodge. Here another entrance is provided leading to an out-building, comprising stables and coach-house. In addition to the main approach there are several entrances from the works, situated to the rear of the offices. The roof of the offices is in three spans, so that light scantlings only are required, two rows of cast-iron columns acting as supports, running the entire length of the building. The centre span is glazed to insure the admission of sufficient light in the middle of the building, the outside spans being covered with blue slates and match-boarded beneath. The whole of the front of the exterior of the building is faced with Accrington plastic bricks.

CO-OPERATIVE PREMISES, SOWERBY BRIDGE.—New premises, erected by the Sowerby Bridge Industrial Society, were opened on the 5th inst. The new buildings, the total cost of which will be about 5,000*l.*, are from the plans of Mr. Medley Hall, architect, Halifax.

NEW BUILDINGS IN SOUTHWARK.—It is proposed to erect a building for a mission hall and home of rest for young blind women upon a site in the Borough-road which has been secured from the Corporation of the City of London. The new buildings will be known as "Hampton Mission." — Lord Llangattock and his son, the Hon. J. M. Rolls, have agreed to give a site at the junction of the New and Old Kent roads for the purposes of the proposed free public library in that quarter of the Borough of Southwark.

COVENTRY AND WARWICKSHIRE HOSPITAL.—The special Committee appointed to consider the question of extensions necessary at the Coventry and Warwickshire Hospital having prepared a report for presentation to the General Committee, the members of both Committees met on the 26th ult. to discuss the matter. According to the report, the operating theatre is entirely obsolete; the domestic accommodation is quite insufficient; the kitchens, etc., are too small; the mortuary and *post-mortem* rooms are inadequate, and the ventilation is very deficient. In considering the question of extension, the report continues: "the Committee are of opinion that the only course to pursue is to prepare a comprehensive scheme, in which due provision is made for supplying all of the deficiencies indicated above." In concluding their report the Committee suggest that the proper order in which the work should be undertaken might be as follows: (1) To purchase the property adjoining the hospital formerly used as a malt-house, and to make such alterations as may be necessary for the purpose of rendering it suitable for a laundry. To build a chimney stack and put down a boiler or boilers of sufficient capacity to provide the necessary hot water and steam for the whole of the buildings. Also to erect such machinery as may be considered useful, to be driven either by a steam engine, or, alternately, by electric motors. (2) To build a new mortuary. (3) To erect a new ward block and kitchen. (4) To make the necessary structural alterations to the existing block. (5) To provide a nurses' home. (6) To provide a proper out-patient department. The approximate cost of the whole of the improvements is estimated at 27,500*l.* At the meeting it was ultimately decided to pass resolutions recommending to the Governors that an extension of the hospital should be made on the present site, and that the Committee should be authorised to obtain competitive architects' designs and to offer a suitable premium. A Sub-Committee was appointed to consider details, and a vote of thanks was passed to Mr. Albert Herbert, of Messrs. Tait and Herbert, Leicester, for valuable assistance rendered in the drawing up of the tentative plans comprised in the Extension Committee's report. The Committee considered at the meeting the part of the scheme which related to the building of a proper mortuary at an estimated cost of from 500*l.* to 600*l.*, and, after a brief discussion, a resolution empowering the Extension Committee to carry out the necessary conversion of the malt-house, which they decided to purchase, into a laundry, and to build the mortuary, at a total estimated cost of 2,000*l.*, including the purchase of the site, was carried *nem con.*

HAMMERSMITH POOR LAW OFFICES.—The opening of the new offices, receiving home for children, and out-relief department in connexion with the Poor Law Union under the jurisdiction of the Hammersmith Board of Guardians took place on the 3rd inst. The new buildings have been erected in three distinct blocks. The Board's offices, which form one block, face Goldhawk-road, are Renaissance in style, executed in Portland stone. The receiving home for children and the out-relief department form the two remaining blocks, with their main entrances in Cathnor-road. The elevations of these buildings are of plain brick. The total cost of the work, including the boundary walls and roadway, etc., amounts to the sum of 23,160*l.* Messrs. Chas. Dearing and Son, of Halliford-street, Islington, have executed the main contracts, amounting to 19,082*l.*: Messrs. Benham and Sons, Ltd., the heating contracts; Mr. George Wimpey, the boundary walls; and Mr. William Winn, the wiring and fittings for electric lighting, etc. Mr. J. Henry Richardson, of the firm of Richardson and White, of Hammersmith, was appointed by the Board of Guardians as architect to prepare the necessary specification and plans and superintend the erection of the buildings. Mr. Samuel A. Stanger, of the firm of Messrs. C. Stanger and Son, Finsbury Pavement, E.C., acted as quantity surveyor, and Mr. R. Manser acted as clerk of works.

BUSINESS PREMISES, NEWCASTLE-ON-TYNE.—New business premises have been erected in Northumberland-street, Newcastle. The building has been constructed of fireproof materials throughout, and has lifts of the "Otis" type. Messrs. Oliver, Leeson, and Wood are the architects.

PUBLIC BATHS FOR KILBURN.—On Tuesday Willesden Urban District Council instructed the engineer to prepare plans and estimates for public baths (swimming bath and slipper baths) to be erected on a site in Stafford and Leinster roads, Kilburn. A special Committee was authorised to inspect buildings of this class in various parts of London.

COUNTY LUNATIC ASYLUM, LEICESTERSHIRE.—Col. A. G. Durnford, R.E., one of the Inspectors of the Local Government Board, held an inquiry at the County Rooms, Leicester, on the 4th inst., into the application of the Leicestershire County Council to borrow a sum not exceeding 214,470*l.* for the purpose of providing their share in the cost of the new lunatic asylum for Leicestershire and Rutland, at Narborough. Mr. S. P. Pick, consulting architect, gave particulars of the estate on which the asylum is to be built. It consists of 184 acres, and is chiefly pasture. The buildings which had been sanctioned by the Lunacy Commissioner provided for 688 patients in the main blocks, including sixty, thirty men and thirty women, under the charity attached to the asylum. Sanction had also been given to the erection of additional blocks to accommodate 224 additional patients, making a total of 912. Besides this there was the ordinary accommodation for the staff, and an isolation hospital. The water would be obtained from the Leicester Corporation, and Worthington pumps would be fixed on the main to increase the pressure in case of fire. The building would be lighted by electricity, manufactured on the estate. An agreement had been come to whereby a railway line was to be built from the London and North-Western mineral line running close by into the asylum grounds. This would give access to both the London and North-Western and Midland systems, the line from which the branch was to be made being a joint one. There was no opposition to the application.

STAINED GLASS AND DECORATION.

NEW WINDOWS, HOARWITHY CHURCH.—Last week five memorial windows were unveiled in Hoarwithy Church, Herefordshire. They were executed in the studio of Mr. H. G. Murray, of London, from the design of Mr. J. P. Seddon, the architect of the church. There is a large central panel with a figure in each light, and smaller panels above with emblematic figures. In the main panel of the central window is Our Lord as "The Light of the World," in a white robe with a blue mantle. The right hand is raised in blessing, while in the left there is a lamp shining forth as a symbol of the title, "Lux Mundi." The background is a varied yellow, gradating into almost ruby tones in parts. In the circular panel above is a Cross in golden yellow, with the letters "Alpha" and "Omega" beneath the arms of the Cross, these being on a blue ground. In the adjacent windows on either side, which are the same size as the central one, are the figures of St. Mark and St. John respectively, on varied blue backgrounds, St. Mark in a golden mantle with pale-ruby lining, St. John in a yellow mantle lined with purple. The two outermost lights have figures of St. Matthew and St. Luke, the former with a mantle of turquoise blue with buff lining thrown over a white robe, the latter with a full blue mantle lined with pale brown over a white robe. In the circles above are the emblems of the saints bearing labels with inscriptions in each case. A brass tablet bearing an inscription is let into the wall below the windows. The total cost of the work was 150*l.*

MEMORIAL WINDOW, HONITON CLYST.—A new memorial window has been placed at the east end of the north aisle of St. Michael's Church, Honiton Clyst. The window consists of three lights, and has for its subjects the virtues of Faith, Hope, and Charity. Messrs. F. Drake and Sons, Exeter, were responsible both for the design and erection of the memorial.

APPOINTMENTS.

ARCHITECT TO THE EDUCATION COMMITTEE, SURREY COUNTY COUNCIL.—Messrs. Jarvis and Richards (London) have been appointed Architects to the Education Committee of the Surrey County Council.

BURGH SURVEYOR, TRANENT, HADDINGTON.—Out of seventy-five applicants for Tranent Burgh Surveyorship, Mr. A. T. Lunn, of Edinburgh, has been appointed.

COUNTY EDUCATION ARCHITECT, CARMARTHENSHIRE.—At a meeting of the Carmarthenshire Education Committee at the Guildhall, Carmarthen, on the 5th inst., Mr. William D. Jenkins, of Llandilo, was elected County Education Architect, at a salary of 200*l.* a year and 25*l.* travelling allowance, out of ninety-four applicants.

FOREIGN.

FRANCE.—The Achille Leclère prize in architecture has been awarded by the Académie des Beaux-Arts to M. Adolphe Thiers, a pupil of M. Pascal. The subject was "A staircase in a large museum." —— The department of L'Assistance Publique intend to rebuild the hospital of Aubervilliers, for contagious diseases, at a cost of nearly two million francs. ——An exhibition of eminent French painters of the XVIIIth century, from Watteau to Fragonard, is to be organised at the Grand Palais on the Champs Elysées, from May 15 to June 15.——The cleansing of the ponds and moat at Chantilly is to be undertaken this year. It is supposed to be done every fifty years, and requires an expenditure of about 300,000 francs. ——The international exhibition of St. Etienne will be opened on April 15. The buildings, on the Place Carnot and the Boulevard Jules Janin, are designed by M. Bernard, architect to the Department of the Loire.——M. Sauvageot has been appointed Inspecteur-Général des Edifices Diocésains, in place of the late M. Corroyer.——The Nouveau Paris Committee has decided on organising an exhibition of balcony flower decorations, to be judged from May 21 to 29 next. ——The Minister of Public Works is engaged on the study of a scheme for a high-road from Thonon to Nice. It is to pass by the Col de Mégère, Albertville, Moustiers, Barcelonette, Col de Cayolle, and Puget-Theniers.

GERMANY.—It has been decided to erect a monument to Conrad Wilhelm Hase at Hanover. New Technical Schools are to be built at Hanover on the site now occupied by a group of buildings used for military purposes.——The sculptor Rudolf Maison died at Munich on February 12, in his fiftieth year. Maison has left many proofs of his artistic skill in different parts of Germany, and his monument to the Emperor Frederic is to be unveiled at Berlin next year.——It has been decided to erect new buildings in the older parts of Frankfort in a style which will as far as possible agree with the architecture of the ancient buildings.——At the Art Exhibition which is to take place at Dresden this year the architects Professor Graff and Herr Wilhelm Kreis will display artistic gardens designed after the style in vogue at the beginning of the XIXth century and that in use at the present day respectively.——Dr.

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Wilhelm Schell, for forty years Professor of Mechanics at the Technical School at Karlsruhe, died there on February 13 in his seventy-eighth year.

AUSTRIA.—The Church of St. Ruprecht, Vienna, is to be restored, not only to ensure the safety of the building, but also that certain portions in Romanesque and early Gothic style that have been built up may be exposed.——The memorial which stands at the grave of those who were killed at the burning of the Ring Theatre in Vienna is to be restored at a cost of 2,500k.——The High Bridge in Wipplinger-street, Vienna, has been rebuilt, and is shortly to be reopened; the work occupied eight months, and was carried out under difficult circumstances.——A large concert hall is to be built at Karlsbad at the end of this season.——A pontoon bridge is to be built across the Eger at Meierhöfen, so that the Karlsbad Town Council can at any time reserve the iron bridge for carriage traffic alone.——The Ministers of Education and Finance at Vienna have received a deputation from Brünn, requesting that the new Technical Schools in that town should be built as soon as possible; the plans of the building are now in progress.——It has been decided to erect a monument at Graz to the Austrian General, Wilhelm, Duke of Würtemberg; a committee has been formed to carry out the work, which the sculptors Johannes Raszka, Georg Winkler, and Richard Jakitsch have been invited to attend.——A Convalescent Home for Children is to be built near Vienna.——The memorial to Charlemagne, which is to be executed by the sculptor Professor Weyr, and which is to be placed in the Church of St. Peter in Vienna, will take the form of a representation in relief of the legend which connects Charlemagne with the founding of the church.

MISCELLANEOUS.

BLUE AND WHITE PRINTS.—Mr. W. Tylar (Aston, Birmingham) sends us a sample of a liquid which he calls "Ferrobleach," the object of which is to write in white on blue-and-white print paper. The writing does not show white till a minute or two after writing, when it comes out a clear, strong white, and does not spread. It seems very useful for its purpose.

OBSTRUCTIONS THROUGH DELIVERY OF BARRELS, ETC., ACROSS FOOTWAYS.—The Local Government and Taxation Committee of the London County Council reported as follows at the meeting of the Council last week:—"On February 24, 1903, we reported upon the question of the obstruction caused by the loading and unloading of barrels, coals, etc., across footways. We then stated that the Home Secretary had expressed the opinion that a by-law could not be made by the Council under section 23 of the Municipal Corporations Act, 1882, in view of the fact that the matter was already dealt with by the Metropolitan Streets Act, 1867, but that he would be prepared to consider proposals for an extension of the 'special limits' of section 15 of the latter Act, *i.e.*, the lists of streets fixed by him within which no coal may be loaded or unloaded and no casks (other than those containing wine or spirits) may be lowered or drawn up by means of ropes across public footapths between the hours of 10 a.m. and 6 p.m. We consulted the Metropolitan Borough Councils with regard to the matter, and some of them sent lists of streets for inclusion within the 'special limits,' but the replies received from others showed such a diversity of opinion that the Council resolved that, when the lists of streets specified by the Metropolitan Borough Councils were transmitted to the Home Secretary, he should be informed that the hours specified in the Act were unsuitable, and that steps should be taken for an amendment of the law. The Home Secretary approved the lists, subject to some alterations and additions, and invited further observations. The remarks of the Borough Councils were, however, practically reiterations of their former views, and, in these circumstances, we came to the conclusion that it would be better for the whole question to be adjourned pending the issue of the report of the Royal Commission on Locomotion and Transport in London, before whom evidence on the subject was given on behalf of the Council. We have now to report the receipt of a letter from the Home Secretary stating that no action will be taken until the Royal Commission shall have made its report."

CHIMNEY-POTS. — Messrs. Sankey and Son send us a description and section-illustration of their improved "Louvre Chimney-pot." It is made, we presume, in fireclay (material is not stated); the louvres are deeper than usual and slightly concave in section, and are divided into sections by six vertical diaphragms, with the idea of concentrating and collecting the draught from whatever quarter the wind blows. None of these contrivances can be depended upon to act always in preventing down-draught, but this seems likely to be one of the most effectual.

DRAWING PENCILS.—Messrs. L. and C. Hardmuth, Austria (no other address), send us a specimen of their "Koh-i-noor" pencils, which appear to have obtained high awards at various exhibitions. The specimen sent is an "H.B.," and is certainly an admirable drawing pencil of its class. Whether we should agree as to all the superiority claimed for these over all or most other pencils it is difficult to say from a single example of one quality only: we would have to try some of the different and softer qualities also to arrive at a general impression. The "H.B." is an excellent architects' pencil for fine drawing, and seems to rub out easily. It is a hexagon section, which we wonder is not now adopted by all makers, considering that pencils which are apt to roll off the drawing-board cause so much trouble.

THE LATE MR. SAXON SNELL.—Mr. Henry Saxon Snell, F.R.I.B.A., of Lancaster Lodge, Amersham-road, Putney, who died on January 10, aged 74, left estate of the gross value of 50,255*l.*, with net personalty 41,860*l.* He bequeathed 100*l.* to the Architects' Benevolent Society, and 750*l.* each to the Royal Institute of British Architects and the Architectural Association and Sanitary Institute, of which the income of 700*l.* is every third year to be devoted to a scholarship or prize, to be called the Henry Saxon Snell Scholarship or Prize, to be applied as may be deemed best to encourage a study of the improved design and construction of hospitals and of convalescent homes, and of asylums for the aged and infirm poor, and improvements in the construction or adaptation of sanitary appliances.

MIDLAND MUNICIPAL OFFICERS' ASSOCIATION.—The fourth annual dinner of the Midland Municipal Officers' Association took place on the 5th inst. at the Great Western Hotel, Birmingham. The President (Mr. A. D. Greatorex, Borough Surveyor of West Bromwich) was in the chair, and among the local gentlemen present were the Mayor (Councillor A. G. Turley, J.P.), Mr. H. E. Copp (Electrical Engineer), Mr. A. J. Pearce (Principal of the School of Art), Mr. Hodson (Manager of the South Staffordshire Tramways), Councillors F. Lempriere and S. Adkins (Handsworth), Councillor F. G. Peake (Chairman of Tipton District Council), Mr. A. Cooke (Oldbury), Mr. T. H. Negus (Castle Bromwich), J. Price (Birmingham), and J. A. Budge. The Mayor of Sutton Coldfield (Councillor R. H. Sadley), proposed the toast of "The Midland Municipal Officers' Association." Such an association was of the highest benefit to those who represented the different municipalities in the district. They were only the ornamental heads, and knew nothing of the troubles and responsibilities of the work of their officers. They were very fortunate in the Midlands in having an association of this kind, as it was the means of bringing things to a practical head. Mr. Greatorex, in replying to the toast, said municipal officers to-day were better trained and more qualified to discharge the duties they had to perform, and different Councils and Corporations must recognise that it paid them to give them fair and remunerative salaries. The objects of the association were to bring municipal officers into closer touch with one another, and by the reading of papers at their meetings and the discussions which took place upon them they all gained information which benefited them in the responsible duties they had to perform. They had the privilege of paying interesting visits to works which were in progress and manufactories, which had been to their benefit and the benefit of the Corporations they had to serve. Another object the association had in view was to get passed a Superannuation Bill for Municipal Officers. The principles of the Superannuation Bill were not by any means new, as the Civil Service, the Army, Navy, and Poor-Law Officers all had superannuation schemes, and they thought municipal officers should also have the benefit of some such scheme.

COMMEMORATIVE TABLET, NEWCASTLE.—A commemorative tablet is to be placed in the banqueting hall in Jesmond Dene, as a record of the gift of parks to the city of Newcastle by the late Lord Armstrong. The tablet is designed in low relief executed in bronze, and consists of a panel, on which a description is written in raised letters. Above this is a medallion of Lord Armstrong, and on either side a panel. Mr. R. Appleby Miller designed the tablet.

THE FATAL FIRE IN THE CITY.—Dr. Waldo, the City Coroner, concluded his inquiry on the 8th inst., at the City Mortuary, Golden-lane, touching the deaths of the victims of the fire in Duke's Head-passage, Paternoster-row, early on the morning of February 25. Mr. G. Fordham, the occupier of the premises, said the ground floor was used as a shop and bar, the walls being match-boarded at the bottom and painted and grained. There was a skylight in the roof, 2 ft. by 8 in., and between ten and twelve feet from the landing. There was also a trap door in the roof of one of the girls' bed-rooms, it being about 2 ft. by 6 ft. square. He had been through it many times. A pair of wooden steps were kept in the bedroom, and by means of those step the trap-door was reached. Police-constable Knights, who was on duty in the neighbourhood of the fire, in the course of his evidence, described the arrival of the fire-escape from St. Martin's-le-Grand, and said it came down Paternoster-row as some posts prevented it from coming into the court. Sergeant Parton said the street posts were placed at one end of the passage to prevent the passage of trucks and the consequent obstruction to passenger traffic. Superintendent Francis pointed out that the place in question was a footway, and people were not allowed to run trucks on the footways. The object of placing the posts there was to prevent the place as a thoroughfare from being used by trucks common to the neighbourhood, namely, heavy box trucks. A fireman named Montague described the difficulties he experienced in getting a wheeled escape to the actual scene of the fire. The overhanging buildings in the neighbourhood were also obstructive. The jury returned a verdict of Accidental Death from Suffocation, and added there was not sufficient evidence to show how the fire originated. They further expressed the opinion that the City authorities should have full powers to inspect all buildings, and compel owners to supply proper means of exit to the roof by fixed ladders or otherwise, and also that for the safety of the residents in Duke's Head-passage the authorities should remove the pillars at the Ivy-lane end, and should demolish the old houses in order to have a proper thoroughfare from Ivy-lane to Paternoster-square.

SOUTHAMPTON TOWN HALL SCHEME. — The Municipal Buildings sub-Committee have considered plans and statements, and have decided to recommend that municipal buildings, costing an approximate sum of 75,000*l.*, would be sufficient to meet the accommodation requirements of the whole borough staff, including education department, as well as providing police court and police and fire-brigade accommodation, and that a very large economy of time and labour in every way would thus be obtained. The Committee unanimously adopted the report of the sub-Committee, and resolved to recommend the Council that new municipal buildings be provided to accommodate the various departments of the Corporation, and including police-court, police, and fire-brigade accommodation, at an estimated cost of 75,000*l.*, on a portion not exceeding two acres of the West Marlands, subject to Parliamentary powers being first obtained to appropriate the land for that purpose.

SOME OLD GLASGOW BUILDINGS.—A meeting of the Architectural Section of the Royal Philosophical Society of Glasgow was held on the 7th inst. in the Rooms, 207, Bath-street—Mr. Macwhannell, President of the Section, in the chair. A paper, entitled "Some Old Glasgow Buildings: Historical and Descriptive," was read by Mr. Alexr. Gardner, hon. secretary. Taking Glasgow about 120 years ago, the lecturer, after a short but graphic description of the city at that date, proceeded to describe the principal buildings then existing possessed of sufficient interest either on account of their architectural features or their historical associations. Beginning at the Cathedral, special attention was given to the "western towers," which unfortunately were removed in the middle of the last century, much to the regret of all antiquarians and persons of taste. The chief historical events connected with the Bishop's Castle, the last vestiges of which were removed about 1790, next claimed attention. The erection of the old College buildings in the High-street was begun in 1632, and completed in the following century, with the exception of the Hunterian Museum. The Tolbooth at the Cross, the site of which had been occupied by an earlier gaol, or tolbooth, known as the Pretorium, was erected in 1626, and removed in 1817, with the exception of the fine old tower now known as the Cross Steeple. The Tron Church Steeple, abutting as it still does on the south side of the Trongate, was built in 1637, and for some time contained the "tron," or public weighing machine, from which it took its name. Hutchesons' Hospital, founded by the brothers George and Thomas Hutcheson, was built in 1641 at a cost of 26,000*l.* Scots, and taken down in 1795 to allow of Hutcheson-street being formed. The stately Shawfield mansion, built in 1711 by David Campbell of Shawfield, was famous in the annals of the city as the scene of the malt tax riots in 1725, and as the headquarters of Prince Charles Edward when he spent ten days in Glasgow in 1745-6 after his retreat from England. The Merchants' Hall in the Bridgegate was erected in 1651-9 from designs by Sir William Bruce,

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of Kinross, afterwards architect to Charles II. The picturesque old steeple still remains as one of the landmarks of old Glasgow, and it was interesting to know that it was due to the successful pleading of the present Lord Provost that the Town Council stayed their hand when its destruction was meditated. St. Andrew's Parish Church, famous for the so-called "flat arches" of its fine portico, was begun in 1740, and finished sixteen years later. The Saracen's Head Inn in the Gallowgate, built 1755, was for long the fashionable hotel of the town, and was visited by Dr. Johnson and Boswell on their return from the Hebrides, Robert Burns, Wordsworth, and Coleridge, and many other notable personages.

Legal.

THE FALL OF A CORNICE.

MR. JUSTICE DARLING tried a case in the King's Bench Division on Wednesday and Thursday last week, in which Mrs. Louisa Brooks claimed damages for the loss of her husband, who met his death through the fall of a portion of the cornice in front of the building of Messrs. Blaiberg, Upper-street, Islington.

Mr. Morton Smith, Mr. Dwyer, and Mr. Alexander (instructed by Messrs. Lickorish and Co.) appeared for the plaintiff, and Mr. Foote, K.C., and Mr. Spokes (instructed by Mr. Richard Barnes) were for the defendants.

On the morning of June 1 last, following the great storm of May 31, a piece of the cement cornice fell, killing the husband of the plaintiff and injuring his brother.

The building had been erected about the year 1886. The cornice was of very slight projection, with a core of brick and stone. A length of about 8 ft. broke away from the cement of the projecting member of the cornice and fell on to the pavement.

Mr. Lovell, a builder, who had been employed to repair the cornice, said that he considered that it had not been built well, but admitted, in cross-examination, that he had told a different tale to the defendant's solicitor, which had been taken down by the solicitor's managing clerk.

For the defendants, Mr. Henry Lovegrove, District Surveyor of South Islington and Shoreditch, stated that in consequence of a telegram from the London County Council he carefully examined the cornice, and struck the remaining 50 ft. with considerable violence, and was so convinced of its soundness that he did not consider a hoarding necessary. Taking all the circumstances into consideration, he considered it possible that the cornice had been struck by lightning.

Mr. Gilbert H. Lovegrove proved that he had made a full-size section of the cornice, which he produced, showing that no portion of the core had broken off.

A doctor of science proved that the accident followed one of the most severe storms in North London within his memory, and thought that it was possible for the electric current to have struck the cornice on its way to some iron rails and brackets immediately below.

The jury were locked up for nearly three hours, and were discharged without giving a verdict.

BELVEDERE BUILDING DISPUTE.

THE case of Bradford and another *v.* Nightingale and others came before Mr. Justice Buckley sitting as an additional Judge of the King's Bench Division on the 4th, 5th, and 9th insts.

Mr. Witt, K.C., and Mr. Drake appeared for the plaintiffs; and Mr. Radcliffe, K.C., and Mr. G. A. Scott for the defendants.

Mr. Witt, in opening the case, said the plaintiffs were artificial stone manufacturers, and the action was brought to recover the balance of an account for laying a floor and for supplying ballast, cement, sand, and other stuff. The original defendant was the late Mr. Benjamin Nightingale, a well-known builder, and his executors had been joined as defendants to the action. The question his Lordship would have to try was whether the work was well done so that the plaintiffs earned their money or so badly done that not only ought the plaintiffs not to be paid, but that the defendants ought to get some damages from the plaintiffs, for which defendants counter-claimed. Mr. Nightingale had entered into a contract to build for the British Fire Lighting Co. a factory at Belvedere, Kent. The original contract was dated September 28, 1901.

His Lordship: When did you begin to lay the floor?

Mr. Witt: I think on June 18, 1902.

His Lordship: When did you complete the work?

Mr. Witt: On August 27, 1902.

Mr. Witt then read a voluminous correspondence which had passed between the parties bearing on the subject.

George Smith, examined by Mr. Witt, said he was foreman for Messrs. Nightingale at the time the job was done. He had sole charge on behalf of Nightingale's of the job. The Portland cement and sand used for the floors was satisfactory. He remembered the plaintiffs men laying the floor, and they did it in a very satisfactory manner. The proportions of cement and sand used were properly measured. Before the floor was properly set, the Fire Lighting Co. moved machinery over the floor on rollers.

Cross-examined.

He had not seen the floor since he had left the works. He did not know that the floor was hard in parts and soft in parts. It was a common thing to leave a cement floor some hours before it was "trowelled off." The length of time a floor could be left before it could be trowelled depended upon the nature of the cement used, and whether it was hot or cool.

Henry Martin, clerk of the works on the job, examined, said he supervised the laying of the floor by the plaintiffs in the machine-room. The architect tested the Portland cement and sand used by the plaintiffs, and he approved of the stuff. The plaintiffs did their work in a thorough manner. Mr. Dawson, the architect, had asked him whether he could assign any reason for the floor going wrong. Witness said he could not. He was not on the works to see the floors completed. He left before.

Cross-examined.

That was the only job on which he had acted as clerk of the works. He had had, however, thirty years' experience in the building trade. He could not account at all for anything going wrong with the floor.

Re-examined.

Mr. Dawson had testified as to his ability in his work.

Henry Mason, examined, said he was in the plaintiffs' employment as a plasterer and floor-layer. He had had fifteen years' experience in the work. He was employed on the work in question from start to finish. The best workmanship was put into the floors. He saw machinery moved on the floor in question before it was set, and he complained about it.

Cross-examined.

He had not seen the floor since he left. He could not account for the floor going wrong.

Edward Wibley, a plasterer and floor-layer, in the employ of the plaintiffs employed on the job, corroborated the evidence of the previous witness. He said that the sand and cement used were very good indeed.

Mr. Chas. Norris, examined, said he carried on business as a sand and ballast merchant at Erith. He supplied Mr. Bradford with the Portland cement and ballast. The cement came from the West Kent Portland Cement Co. It was the same as was used by Nightingale's throughout the whole construction of the factory. From what he saw of it it was excellent, and was approved and passed by Mr. Dawson. The sand was machine-washed pit sand, and was the best that could be made. It was passed by the architect before it was allowed to be used.

Cross-examined.

He took care to see that the cement that the plaintiffs had was the same as was supplied for the rest of the building.

Mr. Walter Bradford, examined, said that in 1902 he was in the employment of the plaintiffs as foreman of the work in question. He had had ten years' personal experience in laying floors. He thought the floor-laying was carried out satisfactorily. The proportions of sand and cement were as specified, and the quality of the cement and sand used was good.

Cross-examined.

The cement was not "spread" in the present case. He had handled the cement to see if it was fit for use. There was nothing in the specification to say that the cement should be kept for a specified time. All the sand used on the job was, as nearly as possible, the same.

Mr. Frank Bradford, a partner in the plaintiff firm, examined, said that before the contract was entered into, he suggested to Mr. Nightingale that a sand and cement floor was not suitable for the use for which it was required. He had examined the floors in question in consequence of complaints, and he had taken samples of the floors and had had them analysed. The analysts reported that the proportions of cement and sand used were as follows:—Cement, 1; sand, 2.5. In his opinion all the floors, except in the machine-room, were in excellent condition. In the machine-room the floor in parts was worn away, but that appeared to be in consequence of heavy machinery having been moved about on it before it was set. Fifty-eight tons of cement, 59 yards of washed sand, and 130 yards of ballast for the lower 6 in. of the floors were used on the job.

Cross-examined.

In an interview that he had with Mr. Dawson after the complaint, he had said that there might have been something wrong with the cement, but, on having the cement analysed, it was proved to be all right. He never said to Mr. Dawson that if he were pressed he would have to take up and relay the floor for the credit of his firm. He never admitted liability to anybody. The most important point they had to keep in their minds was to get cool cement. It was not usual to specify that cement should be "spread" for some weeks before it was used. People like the London County Council might have such a stipulation in the specification.

Mr. Radcliffe: Do you suggest that they are hard-hearted?

The Witness: No; but they are expensive.

Mr. Geo. Edw. Holman, an architect and surveyor, of No. 6, King's Bench-walk, Temple, gave evidence as to having had a large experience in these floors. He had inspected the floor in question. He found the floor worn away in places by the side of the machines and where the traffic went through the doorways. The material used was quite satisfactory, but such material was not fit for a warehouse floor at all.

Cross-examined.

The floor was only soft in places where its surface had been worn or had had its surface disturbed. A cement and sand floor was no good when there was much traffic, and certainly not a 2 to 1 cement and sand floor.

This being the plaintiffs' case, Mr. Radcliffe, on behalf of the defendants, said that the main question, of course, between the parties was one of fact, which was whether or not the floor in question was well laid. The correspondence showed that Mr Nightingale had always said that the plaintiffs were the persons to satisfy the architect for the building owners, and they had better put themselves into communication with him. The correspondence did not disclose that plaintiffs had ever repudiated the suggestion that they were to satisfy the architect for the building owners, but they appeared to have set up that they had satisfied both Mr. Nightingale and the architect. If the correspondence was read it would be seen that Mr. Nightingale throughout had dealt with the matter as though he was not the person really responsible, but who had tried to make the case as light as possible for the sub-contractor.

Mr. W. H. Nightingale, examined by Mr. Radcliffe, said he was for many years in business with his father, who died in July last year. He first saw the floors at the end of September or beginning of October, 1902. On walking over the floors he thought they were very good. He did not try them with a knife. They showed signs of wear. He went down again in February, 1903. He then noticed the floors were not so good. He tried the floors with his knife, and found them partly good and partly soft. Where there was the greatest traffic of all leading into the women's cloakroom the floor showed no, or very little, sign of wear. From what he could see it seemed that either the workmanship or the material used was bad, or that both the material and the workmanship were bad. He thought that a properly-laid floor of cement and sand was suitable for the premises, and would stand the traffic, except that it would show signs of wear where the traffic was exceptionally heavy.

In cross-examination by Mr. Witt, the witness had put to him two letters written by him to the company, in which he stated that the fault of the floors having been worn away was on account of the company having used them before they were quite set, and, while denying liability, offering the company 25*l.* in satisfaction of any claim they might have against them on that head. The witness stated that by doing this he was acting in the best interests of Messrs. Bradford. That was what he thought at the time he wrote the letters. The company had not brought an action against him, but they had not paid him in full.

Mr. C. J. Dawson, an architect of twenty-five years' experience, examined, said he acted as architect for the Firelighter Co. on this job. In consequence of a complaint he received from the company about the floor, he saw Mr. Bradford on the matter. Mr. Bradford could only account for the floor being defective by saying that there must have been something wrong with the cement, and Bradford further said that, for the reputation of his firm, the floor would have to come up. Witness asked Bradford who was going to do that, and Bradford replied that if Mr. Nightingale forced them they must do it. In his opinion the floor in question was very bad. The floor was not wearing as a properly laid floor should do, or as such a floor of properly mixed cement and sand in the proportions of 2 to 1 should do.

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Cross-examined.

The floors seemed soft all over more or less. Smith and Martin were both capable men. He had heard their evidence. He saw nothing wrong in the way the men worked on the floors. Good sand and good cement used in the proportions specified, with proper workmanship, should have made a hard, substantial floor.

Jas. Fraser, chief assistant with Mr. Nightingale, also gave evidence in support of the defendants' case.

Mr. Wm. Woodward, an architect, said he thought the cement used by the plaintiffs, not having been "spread" before it was used, was used too hot. That would have accounted for the defects in the floor which he noticed. He did not think that the defects he noticed were caused by reason of heavy machinery being moved over the floor.

Learned Counsel having addressed his Lordship on behalf of their respective clients,

His Lordship, in giving judgment having stated the facts, said the first question of fact he had to decide was whether the cement and sand used by the plaintiffs were fit for the job, and the second was whether the workmanship used was fit for the job. There was no evidence to show that the materials used were not proper in every respect. As regarded the workmanship, the evidence was that the people who were on the job watching it had nothing to complain of. There was no evidence by the defendants to contradict this. The evidence given on behalf of the plaintiffs was that it could not be expected that a floor of the kind laid would stand much wear, and his Lordship thought that view was correct. The fact was that the floor was interfered with before it properly set. That possibly was the solution of why the floor went wrong. He, therefore, found as a fact that the work was done by the plaintiffs according to the specification, and gave judgment for the plaintiffs for 118*l.* 16s. 9d., with costs, and judgment for the plaintiffs on the defendants' counter-claim, with costs.

ACTION BY THE NORFOLK COUNTY COUNCIL.

MR. JUSTICE WALTON, in the King's Bench Division, on the 5th inst., delivered a considered judgment in the case of the Norfolk County Council *v.* Green and another, an action by the plaintiffs against Mr. Edward Green, of North Walsham, and Mr. E. H. Green, of Antingham, Norfolk, timber merchants, to recover 677*l.* odd in respect of extra expenses incurred in repairs to high roads caused by alleged extraordinary traffic over them by reason of the defendants using a traction engine to haul large quantities of timber from the Beeston Estate to North Walsham and other railway stations. The defendants' contention was that the traffic was not "extraordinary" within the meaning of the Act of 1878, but only the ordinary traffic of a district where there were periodical fellings of timber. Defendants further said that the county rates had been paid by the owners of the wood for many years whilst the timber was growing, and that they held a licence from the County Council to use the traction engine, for which they paid 5*l.* There was a further plea by the defendant Mr. Edward Green, that he was not a partner in the firm when the alleged injury to the roads occurred.

Mr. Justice Walton, in giving judgment, said he should hold that the traffic in question was "extraordinary" within the meaning of the statute, but the plaintiffs were not entitled to the whole amount claimed, as the statute provided that the action must be brought within twelve months of the damage being done. The writ was not issued until August 4, 1902, and therefore the plaintiffs could not recover in respect of any damage caused prior to August 4, 1901. After the latter date very little damage was done, and he thought he should not be going far wrong if he assessed it at 75*l.* He accordingly entered judgment for the plaintiffs for that amount.

Mr. Gregory, on behalf of the defendants, said that, as Mr. Edward Green had retired from the partnership in 1900, he was entitled to judgment against the plaintiffs with costs. The other defendant had paid 110*l.* into court, and, therefore, he would be entitled to the costs of the action, since the date on which the amount was paid in.

His Lordship said that would be so. Mr. Edward Green would have judgment entered for him with costs, and the plaintiffs would recover from the other defendant 75*l.* and costs up to the date when the defendant paid the money into court. After that date the defendant would be entitled to the costs of the action.

A stay of execution was granted on the usual terms, with the view to an appeal.

Mr. Macmorran, K.C., and Mr. Hansell appeared for the plaintiffs, and Mr. Reginald Bray, K.C., and Mr. H. Gregory for the defendants.

TRADE UNION DISPUTE.

THE case of McGuire *v.* Frederick Andrews, Chas. Reynolds, Ernest Boatman, and the Amalgamated Society of House Decorators and Painters (Plaistow Branch) came before Mr. Justice Grantham and a special jury in the King's Bench Division on the 7th inst., an action by the plaintiff, a painter and a member of the City of London Society of House Decorators and Painters, to recover from the defendants, who were respectively the Chairman, Secretary, and Treasurer of the Plaistow Branch of the defendant Association, damages for alleged conspiracy in having, with other members of the Amalgamated Society of House Decorators and Painters, incited Messrs. G. Wright and Sons, contractors of Blackwall, to dismiss the plaintiff from their employment.

The defendants denied the alleged conspiracy, and said that the employment of the plaintiff was the breach of an agreement between Messrs. Wright and Sons and the Amalgamated Society, whereby Messrs. Wright and Sons agreed only to employ men who were members of the Amalgamated Society. Defendants further pleaded that, whatever action was taken by the defendants as officers of the branch, it was a lawful trade combination for which neither they nor the branch could be held liable.

Mr. Ruegg, K.C., and Mr. W. M. Thompson appeared for the plaintiff, and Mr. Robson, K.C., and Mr. Chester Jones for the defendants.

Mr. Ruegg, in opening the case, said the action raised a question of considerable importance to workmen and employers, as it involved the boycotting of the members of one trade union by another union to which a workman did not happen to belong, and dictated to employers as to the men they should employ. The plaintiff had been employed on and off by Messrs. Wright and Sons for the last three years, and on February 2 of last year as he was proceeding to work on the "Star of Australia" Mr. Andrews stopped him, and said he must not go to work on his "ticket," but if he liked to join the defendant society he could go to work the next day. At the same time, two other men, members of the defendant society, were prevented from working with the plaintiff under a threat of being fined 10s. each. Plaintiff refused to join the defendant society, as he would lose the benefit of his union, and, in consequence, he was dismissed by his firm and prevented from getting other employment. The defence was three-fold—a general denial of plaintiff's allegations, and, alternatively, that if Andrews intimidated the plaintiff he had no authority to do so. Further, defendants said that if plaintiff was interfered with, they were justified in getting him dismissed, as Messrs. Wright and Sons had promised to employ only men who belonged to the defendant society.

The plaintiff gave evidence in support of the statement of counsel.

Albert Simpson, foreman at Messrs. Wright and Sons; H. C. Bailey, a painter and a member of the Amalgamated Society of House Painters and Decorators; Mr. John Wright, a member of the firm of John Wright and Sons; Bernard Walsh, and E. Crane, a clerk to Messrs. John Wright and Sons, also gave evidence in support of the plaintiff's case.

At the close of the plaintiff's case Mr. Robson submitted that there was no case to go to the jury. He contended that, in order to bring in the damage suggested, which was more or less general, the plaintiff must show an illegal conspiracy. He submitted that there was no evidence of any conspiracy, though there was evidence that showed that an official of the branch invited the men not to work with the plaintiff.

His Lordship ruled that there was a case to go to the jury.

Mr. Robson intimated that he should not call any evidence on behalf of the defendants.

Mr. Ruegg then addressed the court, submitting that the plaintiff had been deprived of his work in consequence of a conspiracy on the part of the defendant society and the officials of that society, and that the plaintiff was entitled to substantial damages.

Mr. Robson, on behalf of the defendants, submitted that there had not been any conspiracy or intimidation, and that all that was done by the defendants was to exercise their legal rights to say that they would not work with men who did not belong to their organisation, and to induce, if they could, other men not to work with those who did not belong to the organisation. It was, perhaps, selfish, but it was perfectly legal. If it were not, a trade union could not exist. Any man had a right to adopt any method to get business from another man, provided he employed no illegal means in doing it.

His Lordship, having summed up, left the following questions to the jury:—(1) Did defendants conspire to obtain the dismissal of the plaintiff because he was not a member of their Union? (2) Was the plaintiff dismissed from his employment because of the action of the defendants? (3) Did the plaintiff lose work, and what were the damages? His Lordship said that, with regard to the union, the jury could find it liable because the matter had been discussed at the meeting of the union.

The jury returned a verdict for the plaintiff on each question, and assessed the damages at 25*l.*

Judgment accordingly.

A stay of execution was granted on the payment of the money into Court.

CASE UNDER THE PUBLIC HEALTH (LONDON) ACT, 1891.

IN the Court of Appeal, composed of Lords Justices Vaughan, Williams, Stirling and Cozens-Hardy, on the 8th inst., the hearing was concluded of the case of the London and North-Western Railway Co. *v.* the Mayor, Aldermen and Citizens of the City of Westminster, on the plaintiff's appeal from an order of Mr. Justice Joyce in the Chancery Division.

In this case the plaintiffs brought the action for an injunction to restrain the defendants from continuing to trespass upon some premises of the plaintiffs, by permitting a tunnel, staircase and railings, and other works to remain on their land. The facts were shortly as follows:—The plaintiffs in 1866 purchased some land and premises at the corner of Parliament-street and Bridge-street, Westminster, and had rebuilt the premises, a portion of the corner house abutting on Parliament-street being used by them as offices. The defendants had constructed under the centre of Parliament-street public conveniences, the approaches to it being by subways by staircases near the edge of the pavement, one of the entrances being opposite the doors of the plaintiffs' premises. The plaintiffs alleged that this constituted a trespass by the defendants. The defendant's case was, that they had power to do what they had done by virtue of Section 44 of the Public Health (London) Act, 1891. The entrance and staircase of which the plaintiffs complained was to the exent of 2 ft. 9 in., not constructed in the roadway but in the footway, and plaintiffs said this was a trespass on their property, as the Act only vested the soil of the roadway in the defendants, the soil of the footway being vested in the plaintiffs. Plaintiffs further said that defendants had no power to make subways under the street. Mr. Justice Joyce held that the land or soil where the staircase was constructed as to 2 ft. 9 in. in width was the property of the plaintiffs, and being part of the footway not liable to be taken by the defendants for the construction of sanitary conveniences, and therefore he granted an injunction for the removal of this part of the staircase. He said, however, that he thought the soil in question did not belong to the plaintiffs, and if the defendants thought fit they could put the staircase 2 ft. 9 in. further out into the roadway. His lordship further said he could not compel the defendants to restore the old line and curve as it formerly existed, and he suspended the operation of the injunction for six months, to enable an appeal from his dicision. The plaintiffs now appealed.

At the conclusion of the arguments of Counsel, Lord Justice Vaughan Williams, in giving judgment, said he felt great sympathy with the defendants, who, no doubt, desired to do what they thought best for the public. He thought, however, that the defendants had acquired the land in question for purposes not justified by the Act. They had no authority to take land for the purpose of a subway, and he thought they ought to be restrained from so doing. Defendants had, no doubt, power to make an approach to the convenience, and if they had been only providing a convenient access, it might not have been right for the Court to review their discretion. He was of opinion that the appeal should be allowed, and that the injunction ought not to be limited to the excess of 4 ft., but an opportunity should be given to the defendants of making reasonable and proper alterations, and that liberty to apply to this Court should be given.

The other Lords Justices concurred, and the injunction was granted, but its operation suspended, with liberty to apply to this Court. It was also arranged that the injunction should be supended for two months, to enable the defendants to consider whether they would appeal to the House of Lords. If they did

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appeal, the injunction was to be suspended pending the appeal.

Mr. Younger, K.C., Mr. Montague Shearman, K.C., and Mr. Eustace Hills, appeared for the plaintiffs, and Mr. Hughes, K.C., and Mr. D. Pollock, for the defendants.

ACTION AGAINST LANDLORDS FOR DEFECTIVE DRAINAGE.

THE case of Voss *v.* the Fulham and Hampstead Property Co., Ltd., came before the Court of Appeal, composed of Lords Justices Romer and Mathew, on the 7th and 8th insts.

Mr. Crispe, K.C. (with him Mr. O'Connor), in opening the case said it was an appeal by the plaintiff from an order of Mr. Justice Walton in Chambers, confirming the order of the Master, setting aside an interlocutory judgment which had been signed in the action, reserving the costs, and referring the action to an official referee. The action was by the assignee of a lessee against the assignee of a lessor for breach of a covenant to maintain and keep the main drain of the premises demised in proper repair and condition, and for the breach the plaintiff asked for damages. After the issue of the writ the plaintiff took out a summons for directions, and an order was made by the Master on the summons that there should be pleadings in the action, and that the case should be tried by a judge and jury. It was not contended in the first instance by the summons from directions either by the plaintiffs or the defendants that this was a case for reference to an official referee. The time for delivery of the statement of defence was on January 1. On January 19 plaintiff signed interlocutory judgment against defendants for default in delivery of the statement of defence. Defendants then took out a summons to set aside the judgment, and the Master made an order that the judgment should be set aside, that the costs should be reserved, and that the case should be referred to an official referee. On appeal, the Judge in Chambers confirmed the Master's order. The learned Counsel submitted that the Master and the Judge had no jurisdiction to make the order, reserving the costs and sending the case to the official referee. The action in question was one of a class which was constantly tried in the courts. It did not involve any local inquiry or any scientific evidence—a surveyor or a builder could give the evidence as to the condition of the drains.

In the result their lordships, without calling upon counsel for the respondents, held it was a proper case for the official referee, affirmed the order of the Master and of the Judge in Chambers, and dismissed the appeal with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

3,378 of 1903.—F. W. JENKINS: *Manufacture of Bricks, Artificial Stone, and the like.*

This invention relates to the manufacture of bricks, artificial stone, and the like. According to the invention, sand is mixed with molasses, the mixture being first submitted to pressure in a mould, and subsequently treated by heat. In carrying out the invention, sand of any kind, such as ordinary seasand or "tailings," is taken and, preferably, though not necessarily, in a dry state, is mixed with molasses, or refuse, from the sugar refineries. The proportions of the mixture may, for example, be 97 per cent. of sand and 3 per cent. of molasses.

3,638 of 1903.—A. N. CHAMBERLAIN (Chairman of Hoskins and Son, Ltd.) and W. L. B. HALL (Managing Director of Hoskins and Son, Ltd.): *Door Stops.*

A door stop, comprising the combination of a guide or rack, a device sliding in or on said guide or rack, and adapted to grip or to be gripped by the guide or rack, one part being fixed to the door and the other part to the door surroundings, and so adapted that the door will be held fast against the pressure of wind and so forth, but will move under manual pressure, said mechanism being capable of use for locking the door when required.

4,271 of 1903.—J. GLOVER: *Struts.*

A strut, or shore, consisting of a bar, or rod, of any suitable material, or section, to each end of which is pivotted a crosspiece, or waling, by a bolt, or pin, passing through the centre of the waling and slotted hole in the strut. The strut has curved ends, or shoulders, which bear directly against pivotted walings, and relieve the bolts, or pivots, of strain when the strut is placed in position. The walings can make any angle with the strut, and thus they can be set parallel to each other and oblique to the strut for insertion between the polling boards of the trench. The strut is tightened in position by driving either of the walings in the direction of its length until square, or nearly square, with the strut. The strut is released by driving the waling back in the opposite direction.

6,910 of 1903.—A. JONES: *A Lifting and Lowering Shaft, with Brake Combined, for Hoists and the like.*

A lifting and lowering mechanism for hoists and the like, consisting in the combination with a gear wheel loosely mounted on the driving-shaft, of a brake, which is capable of end-way movement along, but is incapable of revolving upon the shaft, and which may be moved so as to be pressed and maintained against the wheel with the required degree of pressure either to lock the pinion to the shaft or allow it to turn in relation thereto.

6,914 of 1903.—J. IRON: *Means, or Apparatus, for use as a Fire Escape, or Lowering, or Removing Persons, or Goods from Buildings or other places.*

The apparatus consists of a canvas, or other bag, or receptacle, with framing, or distending rings, or parts, and, if desired, a solid bottom may be provided. The edge of the framed bag may have a flap, or fan-shaped extension, adapted to be held up in front of the entrance to the receptacle to protect the incoming occupant, and, in the case of nervous people, to shield them from a view of the depth to which they are to descend. A ring, or rings, or eyelets, on this flap provides means whereby attachment of lines, cords, wires, or chains, to draw it up, or support it, may be made. The bag, or bucket, is slung on lines, cords, or chains from hooks, or a wooden, metal, or wood and metal stretcher. The bag may be round, or oval, or half round in shape, with a flat side towards the building, or wall, and may be made of strong textile material, rendered non-inflammable by the application of asbetos, slag wool, or the like, or by dressing with cuprous ammonium, or other treatment.

7,877 of 1903.—C. P. SHOWELL: *Casement Adjustable Fastenings.*

This invention relates to casement adjustable fastenings, and refers more particularly to that class of fastening in which the bracket is secured to the moving casement, and to which is connected the stay, or blade, in which are holes, or the like, which may take on to an upstanding peg which is secured to the casement frame. It has been found impossible to make these blades from a drawn, rolled, or extruded strip of metal. In carrying the invention into effect the blade is prepared from the plain strip which has been rolled, drawn, or extruded, to form at its one end a pivot joint, which is then jointed to a member, which is again formed pivotwise and attached to a base plate so that the said member and plate form, as it were, a bracket to be screwed to the moving casement. Hence the blade may thus have two directions of motion at right angles to each other, the first of which serves to lift the said blade from off the pivot peg of the frame when the casement may be pushed out to the required distance. The second pivottal movement from the bracket permits the blade to be brought into position for the pivot peg at any point. Upon the bracket plate means may further be provided for supporting the blade from falling down, which may consist of a radial ring around the joint of the blade, so that the blade may rest thereon.

8,164 of 1903.—T. POTTER: *Concrete Steppings and Seatings for Public Buildings.*

This invention relates to a method of forming armoured fireproof concrete steppings, seatings, and risers for theatres and similar buildings. The usual way of performing this kind of seating is to form wood troughs or frames, one on each side of the riser and on the underside of the seat. The concrete is deposited in the former and on top of the latter in a soft state, and, when sufficiently hard, the temporary wood is removed. By this invention iron sheets, plain or corrugated, and sometimes galvanised, are used in place of wood, bent to shape to form in one piece a frame, or support, for the concrete back of the riser and the concrete seat. These iron plates are left permanently in position. In this way temporary wood casings are only required for the front of the riser, which are removed when the concrete is sufficiently hard. In the concrete is also embedded, when required, small steel rods, bars, or hoops. Seatings, steppings, etc., are claimed to be light, strong, and quickly made by this means.

8,240 of 1903.—C. WILLIS and A. BATES: *Manufacture of Closet Cones, or Connexions.*

This invention relates to the construction of connexions, or cones, whose purpose is to connect inlet, or outlet, pipes to closet basins or earthenware sanitary appliances. By this invention the advantages of both a metal union and a rubber one combined is claimed to be obtained for making water-tight any such connexions. The ordinary method of making a connexion is by means of a rubber taper tube known as a cone, and consists in stretching the small end over the lead pipe and the large end over the collar, or neck, of the basin. As there is a tendency for such cones to rot in the body, the body is made of any suitable metal, brass, or copper, and at either end is inserted rubber in such form as will produce the surest water-tight joint.

8,359 of 1903.—W. HUTTON: *Window Sashes.*

A sliding sash of the type adapted to be swung on hinges for cleaning purposes, which consists in arranging each hinge in two parts, one on the sash and one on the frame, and adapting one part to be normally removed from the path of the other to permit sliding of the sash, and to be moved into the path of the other in order that the sash may be brought to a predetermined position to bring the respective parts into engagement to enable the sash to be swung inwards.

8,611 of 1903.—T. W. TWYFORD (Managing Director of Twyfords, Ltd.: *Urinal Ranges.*

Urinal ranges, built up of stall sections, which consist in providing the front edges of such sections with rebates, or depressions, adapted, on two sections being placed together, to form complete upright channels for the reception of bonding, or key ribs, formed at backs of facing slabs, or mouldings, which are applied and secured to the fronts of the said meeting-parts of the contiguous stall sections so as to break joint between them.

8,617 of 1903.—J. B. TALBOT-CROSBIE: *Condensers, Radiators, and Heat Exchangers.*

Condensers, radiators, and heat exchangers, consisting of chambers, each formed from one or two sheets of metal, having plain, indented, or corrugated surfaces, the said chambers being strung on pipes, and held thereon by means of nuts and distance pieces, the pipes passing through and communicating with the chambers by means of openings formed through the pipes and the distance pieces, at the parts within the chambers, with or without wire gauze or other suitable material, and baffle parts arranged respectively within the chambers and in the outer space between them.

9,102 of 1903.—C. CALAME: *A Level-indicating Instrument, applicable also for use as a Clinometer and Plumb-rule.*

An instrument, comprising a graduated and counter-balanced disc rotatably mounted in a casing provided with a number of pointers, and having a straight or flat base.

9,181 of 1903.—T. W. TWYFORD (Managing Director of Twyfords, Ltd.): *Automatic Flushing Apparatus, principally for Sanitary Purposes.*

An automatic syphon flushing apparatus, which consists in arranging, or disposing, the catch-box which retains the water for restoring the bottom seal after each discharge upon the top of the chamber, or vessel, containing the bottom seal cup, and providing a syphon for conveying the retained water from the said catch-box to the enclosed sealing cup.

14,885 of 1903.—J. RIGBY and W. R. TAYLOR. *Method of Automatically Opening, Closing, Locking, and Unlocking the Doors of Hoists, Lifts, and other similar structures and apparatus therefor.*

This invention relates to improvements in, or relating to, the method of automatically opening, closing, locking, and unlocking doors of hoists, lifts, and other similar structures and apparatus therefore, and consists in means whereby the said operations are effected by the up and down movements of the hoist cage, together with means for locking the strap fork when the said doors are open on any of the landings or room floor level.

23,246 of 1903.—D. F. COLLICUTT: *Level and Plumb.*

A level and plumb, consisting of a body having parallel edges with a circular opening formed through the body, an arbour arranged in the centre of said opening, a weight secured to the arbour and arranged within the opening, dials secured to the body, provided with central openings, through which the arbour projects, pointers carried by the arbour outside of the dials, glass discs secured to the body opposite of the pointers, said glass discs being provided with central bearings for the arbour, and means adapted to be operated outside of the glass discs for arresting the oscillations of the pointers.

27,211 of 1903.—W. G. GAGNE: *Ventilating Cowls.*

A ventilator, consisting of a hollow sphere, having a series of vertical-slotted openings, curved bands outside of said sphere covering said openings and separated therefrom by

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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ventilating spaces, a cylinder extending into the lower portion of said sphere, and a cone-shaped deflector within said sphere extending from the top downward.

28,103 of 1903.—J. W. D. PRATT: *Brick Kilns and the Process of Burning Bricks.*

A construction of kiln and arrangement of flues in conjunction with dampers so that during the process the hot gases are not directly thwarted in their passage by dampers, thus preventing leakage of hot gases or entrance of cold air round the damper slots.

28,781 of 1903.—J. BARDSLEY: *Door Closers and Checks.*

A door closer, the spindle to be operated from the door, and the casing within which said spindle is mounted, combined with the coiled closing spring for co-operation with said spindle, and the cover plate for said casing containing an opening to receive the upper portion of said spindle, said cover plate having the projection constituting a stop to restrain the upper end of said spring in one direction, and said casing having on its floor a stop to restrain the lower end of said spring in the opposite direction, and said spindle having integral arms in operative connexion with the respective ends of said spring for winding said spring at either end in accordance with the direction of motion imparted to the door.

617 of 1904.—E. ZIEHL: *Mountings for Swinging Windows.*

A window-mounting for swinging windows, which binds the projection of the window sash, keeps it in its open position, and enables the window to be lowered inwards so far that the outside of the window-pane can be cleaned from above in the room, characterised in that a plate is fixed to the window-case, with a rectangularly-bent stay, with a holder having a tapered part at the bottom and a notch in the top and a window-support plate furnished at the bottom with a notch, and carrying at the top a hasp that is let in the notch, which are movably connected by a rivet.

7,905 of 1903.—G. MOORE: *An Iron Trimmer, or Carrier, for Trimmer Joists, to be used in the Construction of Floors of Buildings.*

An iron trimmer, or carrier, to be used in the construction of floors of buildings, formed so as to be readily fixed to long trimmer joists at one end, and kept in position with a bolt, the other end to rest on a stone template bedded on brickwork in the wall.

25,307 of 1903. — G. F. FRY: *Making and Repairing Macadam Roads.*

Making and repairing of macadamised roads, consisting in the use of grouting made of lime or cement, or any other material of the nature of lime or cement, mixed with another material, or used by themselves. The other material may be sand or fine granite, or any other material of the nature of sand or fine granite, or other suitable material, mixed with water and applied with the road material during the process of consolidation.

28,600 of 1903.—W. C. LYON: *Method and Apparatus for Making Concrete Piles.*

A method of making concrete piles, consisting in forming a hole in the ground by means of a former, of filling the former with concrete, hermetically sealing the same, and applying a pressure between the surface of the concrete and the top of the former, whereby the latter will be raised out of the ground, and the concrete forced from the lower end of the former to replace the space occupied by the former.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

February 24.—By HEPPER & SONS (at Morecambe).

Morecambe, Lancs.—"The Morecambe Tower Estate" and Pleasure Grounds, area 9,432 yds., f. £9,500

February 25.—By W. FOWLER, PEMBERTON, & Co. (at Birmingham).

Corley, Warwick.—"The Corsey Estate," area 445 a. 1 r. 17 p., f. (in lots) 21,620

The "Saracen's Head" Inn, and 8 a. 2 r. 13 p., f. 1,550

February 26.—By FAREBROTHER, ELLIS, & Co. (at Lincoln).

Timberland, Lincs.—"The Timberland Estate," comprising farms, lands, etc., area 800 a. 2 r. 36 p., f. (in lots) 17,871

The "Houghton Arms" Inn, and 50 a. 1 r. 10 p., f., y.r. 65*l.* 5s. 1,780

February 29.—By ARTHUR BARTON.

Lee.—10 and 12, St. Mildred's-rd., u.t. 82 yrs., g.r. 28*l.*, y.r. 145*l.* 1,135

By BRODIE, TIMBS, & Co.

Westminster. — 30, Marsham-st. (s.), area 1,600 ft., f., y.r. 48*l.* 1,500

By COOPER & GOULDING.

Walworth.—Larcom-st., f.g.r. 28*l.*, reversion in 59 yrs. 620

Gunnersbury. — Marlborough-rd., "Nyanza," u.t. 73 yrs., g.r. 9*l.* 10s., e.r. 52*l.* 490

By FIELD & SONS.

Bermondsey.—57 & 59, Beatrice-rd., u.t. 29½ yrs., g.r. 7*l.*, w.r. 72*l.* 16s. £500

129, Fort-rd., u.t. 35½ yrs., g.r. 4*l.* 10s., w.r. 36*l.* 8s. 295

11, Reverdy-rd., u.t. 35½ yrs., g.r. 4*l.* 10s., w.r. 41*l.* 12s. 305

By W. W. JENKINSON & Co.

Southwark.—2, Rose-alley (warehouse), f., y.r. 35*l.* 595

By F. LONG & SON.

Battersea.—24, Millgrove-st., u.t. 69 yrs., g.r. 3*l.*, w.r. 28*l.* 12s. 180

Stamford Hill.—228, Seaford-rd., u.t. 78 yrs., g.r. 3*l.* 10s., w.r. 18*l.* 4s. 105

Paddington.—6, Dudley-pl., u.t. 34 yrs., g.r. 3*l.*, y.r. 40*l.* 300

By SPELMANS' (at Norwich).

Norwich.—27, 29, and 37, Oxford-st., f., y.r. 39*l.* 568

56, Pitt-st. (factory), f., y.r. 40*l.* 660

2, Greyfriars, f., y.r. 13*l.* 188

March 1.—By DEBENHAM, TEWSON, & Co.

Hammersmith.—292 to 306 (even), King-st. (s.), area 27,000 ft., f., y.r. 471*l.* 10s. 10,000

66 and 67, Brook-green, area 0 a. 2 r. 19 p., f., y.r. 120*l.* 3,150

Holloway.—11, Hilldrop-cres., u.t. 44½ yrs., g.r. 8*l.*, y.r. 60*l.* 500

Stamford Hill.—10 and 12, Daleview-rd., u.t. 55 yrs., g.r. 11*l.*, y.r. 60*l.* 555

Palmer's Green.—1, 2, 3, and 4, Barrowell-green-villas, f., e.r. 175*l.* 1,620

By J. & W. JOHNSON & Co.

Clapton.—188, Lower Clapton-rd., u.t. 79 yrs., g.r. 7*l.* 10s., e.r. 60*l.* 660

By E. SIMPSON.

Lewisham.—23, Sandrock-rd., u.t. 82 yrs., g.r. 6*l.* 6s., e.r. 36*l.* 400

March 2.—By T. W. CATTELL & Co.

Richmond.—Lion-gate-gdns., l.g.r. 68*l.* 5s., u.t. 78½ yrs., g.r. 4*l.* 1,305

Kilburn.—54, Priory-pk.-rd., f., e.r. 40*l.* 605

By H. DONALDSON & SON.

Dalston.—52, Parkholme-rd., u.t. 32 yrs., g.r. 2*l.* 10s., y.r. 32*l.* 290

23, Lavender-gr., u.t. 39 yrs., g.r. 4*l.*, e.r. 36*l.* 330

By MARK GILBERT.

Enfield Wash.—Alma-rd., etc., f.g.r. 225*l.*, reversion in 50 yrs. 5,025

Inkerman-ter., f.g.r. 13*l.* 2s. 6d., reversion in 50 yrs. 309

Alma-rd., f.g.r. 42*l.* 2s., reversion in 50 yrs. 1,031

By FRANK JOLLY & Co.

Hackney.—110, King Edward-rd., u.t. 35½ yrs., g.r. 7*l.* 10s., y.r. 45*l.* 340

Clapton.—43, Upper Clapton-rd., u.t. 58 yrs., g.r. 10*l.*, p. 760

47, Downs-rd., f., p. 1,550

Leyton.—131, Capworth-st., u.t. 69½ yrs., g.r. 5*l.*, w.r. 26*l.* 160

Stepney.—13, Perriwinkle-st., c., w.r. 22*l.* 2s. 190

By FOSTERS' (at 54, Pall Mall).

Barnes.—40, Castelnau, u.t. 77 yrs., g.r. 16*l.*, p. 1,100

March 3.—By BURLEY & BRACKENBURY.

Hackney Wick.—50, 52, and 54, White Post-la., u.t. 56 yrs., g.r. 8*l.*, w.r. 81*l.* 18s. 505

By NEWBON, EDWARDS, & SHEPHARD.

Islington.—25, Alfred-st., u.t. 22½ yrs., g.r. 5*l.*, y.r. 36*l.* 250

Camden Town. — 205, Camden-rd., u.t. 34½ yrs., g.r. 12*l.*, e.r. 90*l.* 500

Barnsbury.—86, Hemingford-rd., u.t. 36 yrs., g.r. 7*l.*, y.r. 38*l.* 310

Harringay.—22, Wightman-rd. (s.), u.t. 83½ yrs., g.r. 12*l.*, y.r. 80*l.* 1,030

Clapton.—74, Nightingale-rd., f., y.r. 50*l.* 830

By J. ODELL & Co.

Brixton.—153 and 155, Acre-la., u.t. 27½ yrs., g.r. 10*l.*, y.r. 82*l.* 685

Dalston.—8, Mayfield-rd., u.t. 54 yrs., g.r. 7*l.* 10s., y.r. 39*l.* 365

Barton Mills, Suffolk.—Main-st., freehold cottage, area half an acre, y.r. 8*l.* 108

By HARDS & BRADLY.

Southwark.—1 & 8, Bath-ter., f., y.r. 101*l.* 8s. 1,095

Peckham.—8 & 10, Nutbrook-st., u.t. 71 yrs., g.r. 10*l.*, w.r. 70*l.* 4s. 585

Dulwich.—95 to 101 (odd), St. Dunstan's-rd., u.t. 86½ yrs., g.r. 12*l.*, w.r. 88*l.* 8s. 710

Blackheath.—56, Humber-rd., u.t. 91½ yrs., g.r. 6*l.* 6s., e.r. 40*l.* 450

By STIMSON & SONS.

Rotherhithe.—48 and 50, Cathay-st., also "Amhurst Cottage," f., w.r. 65*l.* 520

Dulwich.—239, Upland-rd., and stabling, f., e.r. 60*l.* 880

Brixton.—55, Nursery-rd., u.t. 70½ yrs., g.r. 6*l.*, y.r. 30*l.* 285

Camberwell.—144, Coldharbour-la., u.t. 60½ yrs., g.r. 7*l.*, e.r. 50*l.* 450

68, 70, and 70a, Wells-st. (s.), u.t. 23 yrs., g.r. 36*l.*, y.r. 78*l.* 350

Walworth.—45 and 47, Morecambe-st., f., y.r. 42*l.* 2s. 525

15 to 30, Thornton-st., u.t. 9½ yrs., g.r. 40*l.*, w.r. 416*l.* 800

Old Kent-rd.—43, Ormside-st., u.t. 7 yrs., g.r. 5*l.* 4s., y.r. 60*l.* 100

102, Ormside-st. (s.), u.t. 65 yrs., g.r. 4*l.*, w.r. 26*l.* 180

New Cross.—4, Kender-gr., u.t. 20½ yrs., g.r. 4*l.*, w.r. 32*l.* 10s. 150

By C. C. & T. MOORE.

Holloway.—99, 101, and 103, Marlborough-rd., u.t. 63½ yrs., g.r. 18*l.* 18s., y.r. 96*l.* 8s. .. 925

Willesden.—87, Mayo-rd., u.t. 70 yrs., g.r. 5*l.*, w.r. 26*l.* 145

Shepherd's Bush.—17 to 25 (odd), Tunis-rd., u.t. 76 yrs., g.r. 27*l.* 10s., y.r. 141*l.* 925

Battersea.—123, Speke-rd., u.t. 60½ yrs., g.r. 5*l.* 10s., w.r. 27*l.* 6s. 195

Southend, Essex.—13 to 18, Elizabeth-rd., u.t. 77½ yrs., g.r. 12*l.*, w.r. 124*l.* 16s. 790

Leyton.—11 to 19 (odd), Grove Green-rd., u.t. 73 yrs., g.r. 24*l.* 10s., y.r. 125*l.* 895

Stepney.—80, 82, 84, 86, and 86½, Whitehorse-st. (s.), with yard and stabling, y.r. 132*l.*, also i.g.r. 16*l.*, u.t. 6½ yrs., g.r. 32*l.* 10s... 320

Mile-end.—39, 41, and 92, St. Ann's-rd. (factory premises, etc.), u.t. 51½ yrs., g.r. nil, y.r. 102*l.* £950

Bow.—6, Wellington-rd., u.t. 19½ yrs., g.r. 11*l.*, y.r. 50*l.* 250

Mile-end.—5 to 10, Bruntridge-st., u.t. 32 yrs., g.r. 25*l.* 4s., w.r. 162*l.* 10s. 960

1 and 2, Cordova-rd., u.t. 44 yrs., g.r. 8*l.*, w.r. 57*l.* 4s. 400

1 to 13, Louisa-st.; 1 to 4, Beaumont-st., and King's Arms' Yard, u.t. 10½ yrs., g.r., etc., 55*l.*, y.r. 627*l.* 6s. 1,520

14 to 24, Louisa-st., u.t. 31 yrs., g.r. 20*l.*, w.r. 343*l.* 4s. 2,570

281 to 289 (odd), Mile End-rd. (s.), u.t. 38½ yrs., g.r. 9*l.*, y.r. 260*l.* 2,730

Whitechapel.—75 & 77, Old Montague-st.; 1, 1a (the "Three Crowns" p.h.); 3 to 25, Dunk-st.; 50 to 58 (even), Chicksand-st.; and 34 to 48 (even), Great Garden-st., u.t. 15½ yrs., g.r. 280*l.*, y.r. 919*l.* 12s. 3,750

By E. J. CARTER.

Tunbridge Wells, Kent.—19, Broadwater-down, area 1½ acres, u.t. 55 yrs., g.r. 28*l.*, p. .. 1,600

By A. PREECE & SON (at Beckenham).

Beckenham.—55 to 65 (odd), Birkbeck-rd., f., y.r. 168*l.* 2,380

By H. W. SMITH (at Ilford).

Ilford, Essex.—Colenso-rd., seven plots of building land, f. 406

Durban-rd., two plots of building land, f. .. 112

March 4.—By WM. CLARKSON.

Forest Gate.—169, Romford-rd., f., e.r. 75*l.* .. 950

By PERCIVAL HODSON.

Camden Town.—32 and 34, Torriano-av., y.r. 84*l.*, also i.g.r. 55*l.* 17s., u.t. 40 yrs., g.r. 2*l.* 15s. 1,660

Holloway.—360, Camden-rd., u.t. 38½ yrs., g.r. 12*l.* 10s., y.r. 65*l.* 540

Hampstead-rd.—25, Edward-st., u.t. 17½ yrs., g.r. 9*l.*, y.r. 50*l.* 310

24, Robert-st., u.t. 17½ yrs., g.r. 1*l.* 10s. y.r. 52*l.* 10s. 475

35, Robert-st., u.t. 17½ yrs., g.r. 18*l.*, y.r. 48*l.* 255

Palmer's Green.—Palmerston-cres., a block of freehold building land 405

Tottenham.—59, Vicarage-rd., f., w.r. 31*l.* 4s. 275

By HY. HOLMES & Co.

Marylebone.—17, Paradise-st., u.t. 48 yrs., g.r. 9*l.*, w.r. 102*l.* 14s. 585

2, 3, 4, and 5, Wesley-st., u.t. 19 yrs., g.r. 10*l.*, y.r. 202*l.* 14s. 1,100

By OGDEN, SONS, & OLLEY.

Wimbledon.—Home-pk.-rd., four plots of building land, f. 450

Contractions used in these lists.—**F.g.r. for freehold ground-rent; l.g.r for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.**

MEETINGS.

FRIDAY, MARCH 11.

Institution of Civil Engineers (Students' Meeting).—Mr. W. G. Banister on "The Premium System of Payment for Labour." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor R. Elsey Smith on "Sanitary Building Construction and Planning; Soil and Local Physical Conditions." 7 p.m.

Junior Institution of Engineers.—Visit to the Works of the Electrical Power Storage Company, Millwall. 3 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. J. I. Little on "Sewage Disposal of Country Houses." 8 p.m

SATURDAY, MARCH 12.

Royal Institution.—Right Hon. Lord Rayleigh on "The Life of Stokes," IV. 3 p.m.

Incorporated British Institute of Certified Carpenters. Visit to Victoria and Albert Museum, South Kensington, 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage and Destructor Works, Ealing. 2.15 p.m.

Edinburgh Architectural Association.—Visit to the Midlothian County Buildings, George IV. Bridge.

MONDAY, MARCH 14.

Royal Institute of British Architects.—Mr. J. D. Crace on "Plaster Decoration," with Lantern Illustrations. 8 p.m.

Society of Arts (Cantor Lecture). — Mr. Bertram Blount, F.I.C., on "Recent Advances in Electro-Chemistry," II. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor R. Elsey Smith on "Ventilation, Warming and Lighting." 7 p.m.

Regent-street Polytechnic (University Extension Lectures).—Professor Vivian Lewes on "The Chemistry of Air, Fire, and Water," VII. 8 p.m.

Bristol Society of Architects.—Mr. C. Daubney on "Fire Risk." 8 p.m.

TUESDAY, MARCH 15.

Institution of Civil Engineers.—(1) Mr. G. H. Stephens, C.M.G., M.Inst.C.E. on "The Barrage Across the Nile at Asyut." (2) Sir Robert Hanbury Brown, K.C.M.G., on "The Use of Cement Grout at the Delta Barrage in Egypt." 8 p.m.

Institute of Builders.—Finance Committee Meeting. 3.30 p.m. Ordinary Council Meeting. 4 p.m. Special Council Meeting. 4.30 p.m.

Society of Arts (Applied Art Section).—Mr. A. S. Cole, C.B., on "Recent Developments in Devonshire Lace Making." 4.30 p.m.

Dundee Institute of Architecture.—Mr. P. H. Thoms on "Some Characteristic Features of Scottish Architecture." 8 p.m.

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WEDNESDAY, MARCH 16.

Architectural Association (Discussion Section).—Paper by Mr. P. L. Waterhouse, M.A., on "The Advantages and Disadvantages of Practice in the Colonies." 7.30 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of Members. 8 p.m.

Society of Arts.—Mr. L. P. Ford on "Artificial and other Building Stones." 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(1) Inspection at the East London Water Works, Lea Bridge, Clapton. 3 p.m. (2) Mr. W. C. Tyndale on "Sanitary Appliances." 7 p.m.

Edinburgh Architectural Association (Associates' Paper).—Mr. A. Ingleby Wood on "Pewter." 8 p.m.

Institution of Civil Engineers.—Students' visit to the Pianoforte Works of Messrs. John Broadwood & Sons, Limited, Stour Road, Old Ford, E. 2.30 p.m.

British Archæological Association.—(1) Mr. Andrew Oliver on "Whitehall and the Thames," with Maps and Views. (2) A short Paper by Mr. Chas. Lynham, F.S.A. 8 p.m.

Institute of Builders. — Annual General Meeting. 3 p.m.

THURSDAY, MARCH 17.

Carpenters' Hall, London Wall (Free Lectures on Matters Connected with Building).—Professor R. Elsey Smith will read a paper on "Canterbury Cathedral," prepared by the late Professor T. Roger Smith. 8 p.m.

London Master Builders' Association.—Finance Committee Meeting. 3.15 p.m. Council Meeting. 4 p.m.

FRIDAY, MARCH 18.

Institution of Mechanical Engineers.—M. Edouard Sauvage on "Compound Locomotives in France." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "House Drainage." 7 p.m.

SATURDAY, MARCH 19.

Architectural Association.—Fifth spring visit, to the Belgrave Hospital for Children, Clapham-road, by permission of Mr. H. P. Adams.

Royal Institution.—The Right Hon. Lord Rayleigh on "The Life of Stokes." V. 3 p.m.

London Association of Correctors of the Press.—Jubilee Dinner, Grand Hall, Hotel Cecil, Right Hon. Viscount Goschen, P.C., in the chair. 6.30 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Morden Hall Dairy Farm, Morden, Surrey. 3 p.m.

The Junior Institution of Engineers.—Conversazione at the Westminster Palace Hotel. 7 p.m.

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 10 0	,, ,, ,,
Flettons	1 10 0	,, at railway depôt.
Red Wire Cuts	1 13 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Rubbon Facing	5 0 0	,, ,, ,,
Best Blue Pressed Staffordshire	4 4 0	,, ,, ,,
Do. Bullnose	4 10 0	,, ,, ,,
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GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamferred, Squints	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers, and Header Quoins, Bullnose, and Flats	12 0 0	,, ,, ,,
	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamferred, Squints	14 0 0	,, ,, ,,
Second Quality, White and Dipped Salt Glazed	2 0 0	,, less than best.

BRICKS, &c.—(*continued*)—

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	30 0	per ton, ,,
Best Ground Blue Lias Lime	21 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s. 0d.	per yard, delivered.
Stourbridge Firechay in sacks	27s. 6d.	per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depot	1 8½	,, ,,
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	,, ,,
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	,, ,,
	s. d.	
Ancester in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer ,,	1 6	,, ,,
Greenshill ,,	1 10	,, ,,
Darley Dale in blocks	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 0	,, ,,
Red Mansfield ,,	2 4	,, ,,
YORK STONE—*Robin Hood Quality.*	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. ,,
6 in. rubbed two sides ditto, ditto	2 6	,, ,,
3 in. sawn two sides slabs (random sizes)	0 11½	,, ,,
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	,, ,,
1½ in. to 2 in. ditto, ditto	0 6	,, ,,
HARD YORK—		
Scappled random blocks	3 0	per ft. cube ,,
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. ,,
6 in. rubbed two sides Ditto	3 0	,, ,,
3 in. sawn two sides (slabs random sizes)	1 2	,, ,,
2 in. self-faced random flags	0 5	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
,, ,, ,, 6 in. sawn both sides landings	2 7	deld. rly. depôt per ft. super. deld. rly. depôt
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 ,, ,,	13 17 6	,, ,,
20 × 10 best seconds ,,	12 15 0	,, ,,
20 × 12 ,, ,, ,,	13 10 0	,, ,,
16 × 8 ,, ,, ,,	7 0 0	,, ,,
20 × 10 best blue Portmadoc	12 12 6	,, ,,
16 × 8 best blue Portmadoc	6 12 6	,, ,,
20 × 10 best Eureka unfading green	15 2 6	,, ,,
20 × 12 ,, ,,	17 2 6	,, ,,
18 × 10 ,, ,,	12 10 0	,, ,,
16 × 8 ,, ,,	10 5 0	,, ,,
20 × 10 permanent green	11 10 0	,, ,,
18 × 10 ,, ,,	9 10 0	,, ,,
16 × 8 ,, ,,	6 10 0	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. ,, ,,
Best Brosely tiles	50 0	per 1000 ,, ,,
Do. Ornamental tiles	52 6	,, ,, ,,
Hip and Valley tiles	4 0	per doz. ,, ,,
Best Rubbon red, brown, or brindled do. (Edwards)	57 6	per 1000 ,, ,,
Do. Ornamental do	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 0	,, ,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 ,, ,,
Do. Ornamental do	54 6	,, ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,
Best "Rosemary" brand plain tiles	48 0	per 1000 ,, ,,
Best Ornamental tiles	50 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000 ,, ,,
Do. pressed	47 6	,, ,, ,,
Do. Ornamental do	50 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 6	,, ,, ,,

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less thn best
Battens: seconds	0 10 0 ,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards—		
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,

WOOD—(*continued*)—

	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0
JOINERS' WOOD.		
White Sea: first yellow deals,	At per standard.	
3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
,, ,, 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
,, ,, 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
,, ,, 3 in. by 9 in.	12 10 0	13 10 0
,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 6
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders, ordinary sections	8 2 6	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 5 0	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0	8 5 0
Staffordshire "Marked Bars"	10 0 0	—
Mild Steel Bars	8 15 0	9 5 0
Hoop Iron, basis price	9 5 0	9 10 0
,, ,, Galvanized	17 10 0	—

(*And upwards, according to size and gauge.)

Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0	—
,, ,, 24 g.	10 15 0	—
,, ,, 26 g.	12 5 0	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	—
Ordinary sizes to 22 g. and 24 g.	13 5 0	—
,, ,, 26 g.	14 5 0	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0	—
,, ,, 22 g. and 24 g.	16 10 0	—
,, ,, 26 g.	18 0 0	—
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0	—
,, ,, 22 g. and 24 g.	13 0 0	—
,, ,, 26 g.	13 15 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0	—
,, ,, 26 g.	14 0 0	—
Cut nails, 3 in. to 6 in.	9 0 0	9 10 0

(Under 3 in., usual trade extras.)

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LEAD, &c.

	Per ton, in London. £ s. d.		£ s. d.
LEAD—Sheet, English, 3lb. and up	14 10 0	...	—
Pipe in coils	15 0 0	...	—
Soil pipe	17 10 0	...	—
Compo pipe	17 10 0	...	—
ZINC—Sheet—			
Vieille Montagne ...ton	26 5 0	...	—
Silesian	26 0 0	...	—
COPPER—			
Strong Sheet...per lb.	0 0 10½	...	—
Thin ,, ... ,,	0 0 11½	...	—
Copper nails ... ,,	0 0 11	...	—
BRASS—			
Strong Sheet ...per lb.	0 0 10	...	—
Thin ,, ... ,,	0 0 11	...	—
TIN—English Ingots ... ,,	0 1 4	...	—
SOLDER—Plumbers' ... ,,	0 0 6½	...	—
Tinmen's ... ,,	0 0 8	...	—
Blowpipe ... ,,	0 0 9	...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft. delivered.
,, fourths	1½d. ,, ,,
21 oz. thirds	3d. ,, ,,
,, fourths	2½d. ,, ,,
26 oz. thirds	3½d. ,, ,,
,, fourths	3d. ,, ,,
32 oz. thirds	4½d. ,, ,,
,, fourths	4d. ,, ,,
Fluted Sheet, 15 oz.	2½d. ,, ,,
,, 21 oz.	3½d. ,, ,,
⅛ Hartley's Rolled Plate	1½d. ,, ,,
⅜ ,, ,, ,,	1¾d. ,, ,,
¼ ,, ,, ,,	2½d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 7
,, ,, ,, in drums	,,	0 1 10
Boiled ,, ,, in pipes or barrels	,,	0 1 10
,, ,, ,, in drums	,,	0 2 1
Turpentine, in barrels	,,	0 3 9
,, in drums	,,	0 3 11
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	,,	19 0 0
Best Linseed Oil Putty	per cwt.	0 7 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

C. & W.—T. G.—B. H. & Co. (Amounts should have been stated).—T. H. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER and *not* to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERGAVENNY.—For alterations, additions, and repairs to school building in Castle-street and Hereford-road, for the School Board. Mr. E. A. Johnson, Architect to the Board:—

J. Charles	£2,822	J. G. Thomas	£2,826
T. S. Foster	2,345	E. C. Jordan	2,276

BANGOR.—For about 448 lineal yards of pipe-sewer in Seacliffe-road, for the Urban District Council. Mr. E. L. Woods, C.E., Town Surveyor, Bangor:—

Warkman, Ltd.	£802 0	Hugh Wheelly	£577 0
Jas. Ross & Sons	759 0	Robert Caulfield, Bangor*	499 17
Robert Legge	715 0		
Wm. Legge	645 0		

BOWERHAM (Lancaster).—For the erection of a shop and dwelling-house at Bowerham, for Mr. E. Williams. Mr. J. Parkinson, architect, 67, Church-street, Lancaster. Quantities by architect:—

Masonry and Joinery: R. Thompson, Lancaster	£475 0 0
Slating and Plastering: R. Hall & Son, Lancaster	69 0 0
Plumbing: J. A. Goad, Lancaster	70 0 0
Painting: T. Holden, Lancaster	20 19 9

CALDBECK.—For 2 in. cast-iron main, valve, road boxes, etc., for Wigton Rural District Council. Mr. W. Brown, Surveyor, Kildare, Wigton. Quantities by Surveyor:—

Milward & Co., Carlisle* ... £187

CARLISLE.—For the erection of two houses and shops in London-road, for Mr. J. Tiffen. Mr. H. H. Hodgkinson, architect, 9, Lowther-street, Carlisle:—

Builder: G. Hill & Son, South Henry-square	Total.
Joiner: J. Hendson, Finkle-street	
Plaster: D. Johnson, East Norfolk-street	£803 5 6
Plumber: W. J. Wilson, Lowther-street	
Painter: R. S. Kirk, Henry-street	
Slater: Wm. Nanson, Lowther-street	

[All of Carlisle.]

DEVONPORT.—For the erection of an entrance lodge and other buildings at the new Cemetery, North Prospect, for the Devonport Corporation. Mr. J. F. Burns, Borough Surveyor, Municipal Offices, Devonport:—

Ambrose	£1,793 18 0	A. N. Coles	£1,599 0 0
Jenkin & Son	1,771 0 0	F. J. Stanbury, Devonport*	1,572 2 0
Partridge	1,656 0 0		
S. Roberts	1,655 1 9		

DEVONPORT.—For levelling, paving, and completing Florence-street, Barton-avenue, Trelawney-avenue, etc., for the Town Council. Mr. J. F. Burns, Borough Surveyor, Muncipal Offices, Devonport:—

Florence-street: E. Duke, Plymouth*	£239 5 1
Lane between Welsford and Balmoral-avenues: T. Domy, Plymouth*	315 17 6
Barton-avenue (Section 2): T. J. Stanbury, Devonport*	119 8 1
Trelawny-avenue: Jefford & Sons, Devonport*	306 3 7
Lane between Pasley-street and St. George's-terrace: E. Duke, Plymouth*	499 7 9

DROYLSDEN.—For street works, Medlock and Hart streets, for the Urban District Council. Mr. C. Hall, Surveyor to the Council, 10, Ashton-road, Droylsden:—

Bates & Co.	Medlock-st. £2,316 0 0; Hart-st. 565 0 0	£2,881 0 0	
W. H. Hurst	Medlock-st. 2,166 0 0; Hart-st. 538 0 0	2,704 0 0	
F. Mitchell & Sons	Medlock-st. 2,118 19 3; Hart-st. 525 6 11	2,644 6 2	
Worthington	Medlock-st. 1,876 10 10; Hart-st. 473 6 10	2,349 17 8	
J. Culshaw	Medlock-st. 1,830 18 9; Hart-st. 482 17 5	2,313 16 2	
Gosling & Stafford, Hazelgrove, Manchester*	Medlock-st. 1,815 2 0; Hart-st. 464 8 2	2,279 10 2	
Surveyor's estimate	Medlock-st. 2,048 0 0; Hart-st. 523 0 0	2,571 0 0	

ETON (Bucks).—For new fire brigade station, High-street, Eton, for the Urban District Council. Mr. C. W. Baker, architect, 24, Heythorpe-street, Wandsworth, S.W. Quantities by Mr. J. Simmonds, Surveyor to the Council:—

G. Geay	£2,725 0	Butcher & Hendry	£2,570 0
Hollis & Sons	2,698 0	H. Burfoot	2,443 10
T. J. Messom & Sons	2,691 0	W. Watson, Ascot‡	2,369 0
H. D. Bowyer	2,685 0	G. H. Gibson	2,348 0
Thompson & Beveridge	2,669 0	W. Green & Sons	2,325 0
J. Fergusson & Co.	2,598 0	E. Chamberlain	2,320 0
		H. Flint	2,269 0

‡ Accepted subject to sanction to loan by Local Government Board.

HANWELL.—For sewering, levelling, paving, etc., Rosebank-road (lower portion), and footpaths, for the Urban District Council. Mr. S. W. Barnes, A.M.Inst.C.E., Council Offices, Hanwell, W.:—

B. Nowell & Co.	£932 13 3	T. Watson, jun.	£818 1 4
H. Morecroft	898 0 0	W. Neaves & Son	799 1 6
J. Macklin	879 8 9	R. Ballard, Ltd.	797 0 0
London & County Builders, Ltd.	875 9 0½	Harvey Bros., V'toria-st. S.W.*	788 12 8
F. Fowles	834 0 0		

HASTINGS.—For laying about 686 ft. of 6 in. pipe sewer in Old Roar-road, Silverhill, for the Corporation. Mr. P. H. Palmer, Borough Engineer, Town Hall, Hastings:—

Joseph Harvey, 53, King's-road, St. Leonard's ... £120

HIPPERHOLME.—For supply of about 139 tons of cast-iron water pipes for the Urban District Council. Mr. G. W. Thompson, Surveyor, Council Offices, Hipperholme:—

L. Cooper	£813 0 0	J. & R. Ritchie	£661 5 0
J. Oakes & Co.	709 15 0	Staveley Iron Co., Ltd.	657 5 0
Stanton Ironworks Co., Ltd.	680 12 6	E. & W. H. Haley, Bradford*	656 12 6
Cochrane & Co., Ltd.	670 12 6	Sheepbridge Iron Co.	652 11 3
Clay Cross Co.	667 3 4		
J. Blakeborough	665 0 0		

HULL.—For the erection of the Carnegie Public Library, West Park, Anlaby-road, for the Corporation Mr. J. H. Hirst, City Architect, Town Hall, Hull:—

Evans & Barton	£2,798 18 8	E. Good & Son	£2,495 18 7
J. H. Fenwick	2,660 0 0	H. Kaye	2,415 0 0
Simpson & Son	2,595 2 0	J. R. Woods	2,410 17 0
T. Bulby	2,585 0 0	F. Singleton	2,390 0 0
J. Carr	2,521 17 5	F. Southern	2,355 4 6
T. Coates	2,500 0 0	H. T. Arnott*	2,333 2 6

[All of Hull.]

HUTTON (Essex).—For the erection of children's homes, schools, etc., for the Guardians of Poplar Union. Messrs Holman & Goodrham, architects, 6, King's Bench-walk, Temple, E.C. Quantities by Messrs. J. Rider Hunt & Co., 181, Queen Victoria-street:—

	Including Additional Glazed Bricks, etc.
Harris & Wardrop	£188,676 .. £193,254
S. J. Scott	188,567 .. 194,004
Perry & Co.	182,435 .. 186,887
Leslie & Co., Ltd.	177,009 .. 181,775
J. S. Hammond & Son	176,880 .. 181,334
F. & T. Thorne	174,861 .. 179,140
G. Parker	174,659 .. 179,700
J. Smith & Son	170,997 .. 174,965
F. G. Minter	169,482 .. 175,730
Pattinson & Son	168,864 .. 173,193
C. Miskin & Son	167,432 .. 171,772
C. Wall, Ltd.	165,040 .. 168,687
Holliday & Greenwood	163,329 .. 167,448
Kirk & Randall	162,830 .. 167,486
McCormick & Sons*	161,828 .. 165,820
F. & E. Davey, Ltd.	157,475 .. 161,427

LANCASTER.—For additions to vagrants' ward and boiler-house, etc., at the workhouse. Mr. J. Parkinson, architect, 67, Church-street, Lancaster. Quantities by architect:—

Masonry: T. Mawson & Son, Lancaster	£649 10 9
Joinery: Peill & Riley, Lancaster	190 6 0
Slating and Plastering: H. J. Till, Lancaster	144 0 0
Plumbing: Harrison & Moser, Lancaster	80 18 4
Painting: E. C. Sarr, Lancaster	21 15 0
Heating: A. Seward & Co., Lancaster	26 10 0
Steam Boiler: J. Foster & Sons, Preston	273 0 0
Disinfector: Goddard, Massey, & Warner, Nottingham	260 0 0

LANCHESTER.—For sewerage-disposal works and footbridge at Langley Park, for the Rural District Council. Mr. J. R. Lupton, Surveyor, Lanchester. Quantities by Surveyor:—

Smart Walker, Cockfield, Bishop Auckland, co. Durham* ... £1,695

LONDON.—For additional buildings at South-grove Workhouse, Mile End, for the Guardians of Whitechapel Union. Mr. A. Conder, architect, 9, Bridge-street, Westminster, S.W.:—

Wm. Hooper	£4,200 0 0	M. Calnan & Son	£3,456 0 0
Watts, Johnson, & Co.	3,997 0 0	C. Yates & Co.	3,443 0 0
A. E. Symes	2,365 0 0	Todd & Newman	3,433 0 0
R. A. Dean & Co.	3,804 0 0	Jno. Greenwood, Ltd.	3,425 0 0
Johnson & Co.	3,751 0 0	Albert Monk	3,419 0 0
Leslie & Co., Ltd.	3,627 0 0	Hy. Knight & Son	3,400 0 0
Ferry Building Co.	3,620 0 0	J. Chessum & Son	3,395 0 0
Wm. Reason	3,597 0 0	H. Kent	3,388 0 0
B. E. Nightingale	3,559 0 0	W. Lawrence & Son	3,384 0 0
J. Grover & Son	3,540 0 0	J. Appleby & Sons	3,372 0 0
F. & T. Thorne	3,496 0 0	Forster Bros.	3,349 0 0
J. Ferguson & Co.	3,495 0 0	Chas. North	3,320 0 0
E. Good & Son, Ltd.	3,491 10 2	W. Akers & Co.	3,252 0 0
Johnson Bros.	3,491 0 0	H. Young	3,243 0 0
Harris & Wardrop	3,479 0 0	R. & E. Evans	3,149 0 0

LONDON.—For reconstruction of the South-Eastern Hospital, Avonley-road, New Cross-road, S.E., for the Metropolitan Asylums Board. Messrs. T. W. Aldwinckle & Son, architects, 20, Denman-street, London Bridge, S.E. Quantities by Messrs. W. H. Barber & Son, 22, Buckingham-street, Adelphi, W.C.:—

G. E. Wallis & Sons	£128,293	Charles Wall, Ltd.	£117,044
A. N. Coles	126,944	Walter Lawrence & Son	116,573
Chas. Dearing & Son	123,590	F. G. Minter	116,500
A. J. Bateman	121,977	Henry Martin	116,200
Foster & Dicksee	121,900	Kirk & Randall	112,970
Leslie & Co., Ltd.	120,449	G. Godson & Sons, Pembroke Works, Kilburn-lane, W.*	109,699
B. E. Nightingale	118,250		
W. Johnson & Co., Ltd.	117,406		

LOWESTOFT.—For new free library, for the Corporation. Mr. G. W. Leighton, architect, 6, Princes-street, Ipswich:—

Grimwood & Sons	£6,593	Youngs & Sons	£6,219
Earle	6,527	Beckett	6,097
Cole	6,492	Bedwell & Parker	6,090
Elsey	6,425	Hawes & Sons, Norwich*	6,000
Linzell	6,397		

[Accepted subject to reduction.]

NEATH.—For new roofs, etc., and alterations to the general market. Mr. D. M. Jenkins, A.M.Inst.C.E., Borough Engineer, Gwyn Hall, Neath:—

Contract No. 1. (*Builder's Work, etc.*)

Lloyd Bros.	£3,418	J. Snow	£2,755
Knox & Wells	3,015	Goodridge & Son, Neath*	2,547
Jones, Price, Rees, & Davies	2,934	W. H. Creighton	2,417
Bennett Bros.	2,923	C. & F. Gaen	2,396
E. Thomas	2,867		

TENDERS—*Continued on page* 299

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Council Schools	Twickenham U.D.C.	Not stated	No date
*New Public Library, Calne, Wilts.	The Committee	Not stated	April 9

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Steel Condensor Platform at Smithfield Market	Manchester Corporation	City Architect, Town Hall, Manchester	Mar. 11
Additions, etc., to Sessions House, Lincoln	.....	W. Mortimer & Son, Architects, Lincoln	do.
Road Material and Repairs	Riccall R.D.C.	E. Townsend, Clerk, 1, Abbey-place, Selby	Mar. 12
Painting at Offices, Depot, and Pumping Stations	Hull Corporation	F. J. Bancroft, Water and Gas Engineer, Alfred Gelder-st., Hull	do.
Five Coal Wagons	Pontypridd U.D.C.	E. Jones, Gasworks, Treforest	Mar. 14
Dry Gas-meters	Leeds Corporation	R. H. Townsley, Gas Offices, East-parade, Leeds	do.
Supplies, Electricity Department	Norwich Corporation	City Electrical Engineer, Norwich	do.
Paper Insulated Cables (Twelve Months' Supply)	Electricity Com., Warrington Corp.	F. V. L. Mathias, Borough Electrical Eng., Howley, Warrington	do.
Electric Motors (Twelve Months' Supply)	do.	do.	do.
Engineering Workshop, etc., at Municipal Tec. Schs.	Brighton Education Committee	Borough Engineer and Surveyor, Town Hall, Brighton	do.
Central Hall, Hartington-street, Barrow-in-Furness	.....	J. F. Curwen, F.R.I.B.A., 26, High-gate, Kendal	do.
Eight Hydraulic (Wagon) Lifting Rams	Dundee Gas Commissioners	A. Yuill, Gas Engineer, Gasworks, Dundee	do.
Carburetted Water Gas Plant at Gasworks	do.	do.	do.
Ear'nware Pipe Sew. & Sur. Wat. Drs. in Arbury-rd.	Nuneaton & Chilvers Coton U.D.C.	T. C. Cook, Engineer, Council Offices, Nuneaton	Mar. 15
Street Watering Posts	Waltham Holy Cross U.D.C.	W. T. Streather, Engineer to Council, Waltham Abbey	do.
Materials, etc.	Hampton U.D.C.	S. H. Chambers, Surveyor to Council, Public Offices, Hampton	do.
Materials and Repairs	Ipswich Sanitary Authority	E. Buckham, Borough Surveyor, Town Hall, Ipswich	do.
Repairs to Wall and other Works at Union Wk'house	Belfast Guardians	J. W. Robb, Clerk, Union Workhouse, Belfast	do.
Materials	Bucklow R.D.C.	J. Burgess, Tabley Superior, near Knutsford	do.
Runmerry Steading, Alves	.....	J. Beattie, Earlsmill, Forres	do.
Renewal Runmerry Cottage	.....	do.	do.
Double Cottage, Lochyhill, Forris	.....	do.	do.
Double Cottage, West Kerrogair, Petty	.....	do.	do.
Fifty Eng. Heart-oak Posts, at Melton Station, G.E.R.	Woodbridge R.D.C.	G. Cook, Surveyor, Grundisburgh, near Woodbridge	do.
400 Feet Gas Tubing	do.	do.	do.
Materials, Waterworks Department	Leads Corporation	City Engineer's Waterworks Office, Municipal Buildings, Leeds	do.
Electric Light at Workhouse, Pleck-road	Walsall Guardians	A. H. Lewis, Clerk, 29, Leicester-street, Walsall	Mar. 16
Furn. Dining-hall & Kitchen at W'khouse, Knutsford	Bucklow Guardians	R. J. M'Beath, Architect, Birsiam House, Sale	do.
Urinal, near Drill Shed	Warrington Sanitary Committee	T. Longdin, Borough Surveyor, Warrington	do.
Pipes, Castings, Tubes, and Fittings, etc.	Halifax Gasworks Committee	J. Wilkinson, Engineer, Gasworks, Halifax	do.
Shedding and Hoarding for Showyards	Herefordshire, etc., Agricultural Soc.	T. H. Edwards, Secretary, Corn Exchange Offices, Leominster	do.
Iron Engine Shed	Ross R.D.C.	G. F. Minett, Clerk, Church-street, Ross, Herefordshire	do.
Electric Wiring, Crown and Mitre Hotel, Carlisle	Walter Scott	S. W. Cuttriss, Engineer, Prudential-buildings, Park-row, Leeds	do.
Road Material	Cuckfield R.D.C.	A. Macarthur, Surveyor, Council Offices, Hayward's Heath	do.
Deck Bridges (40 ft. and 60 ft. spans)	East India Ry. Co.	C. W. Young, Nicholas-lane, London, E.C.	do.
Pub. Lib'y & R'ding R'ms, Rawmarsh Hill, Parkgate	Rawmarsh U.D.C.	J. Platts, Architect, High-street, Rotherham	do.
*Two Semi-Detached Resi., Thornhill-rd., Edgerton	.....	J. Berry, Architect, 3, Market-place, Huddersfield	do.
*Making-up and Paving Roads	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.	do.
Improvement of Nicholson-street, Castleford	Castleford U.D.C.	W. Green, Surveyor to Council, Castleford	Mar. 17
Glazed Earthenware Pipes, etc., for Sewerage	Leeds Corporation	City Engineer's Office, Leeds	do.
Lime at Knostrop Sewage Works	do.	do.	do.
Castings required by Sewerage Committee	do.	do.	do.
Cement	do.	do.	do.
450 Lineal Yards of Iron Unclimbable Hurdles	Street Committee, Warrington	T. Longdin, Borough Surveyor, Warrington	do.
Alterations and Additions, Coggeshall	Heart-in-Hand Indus. Co-op. Society	J. W. Clark, Architect, Coggeshall	do.
Restoring Butt's Mill, Gomersal	.....	W. H. D. Horsfall, Architect, 6, Harrison-road, Halifax	do.
C.I. Girders, etc., Cov. Ser. Res'voir, Heath Waterw'ks.	Cardiff Corporation	C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff	do.
400 Tons of c.i. Socket Pipes	do.	do.	do.
Bowl House, West Meadows	Edinburgh Corporation	R. Morham, City Arch., Public Works Office, City-cham., Edinburgh	do.
*Extension of Platform Awning, Hawes Junction	Midland Railway	Company's Architect, Cavendish House, Derby	do.
*Cleaning and Painting Buildings, etc.	do.	do.	do.
Three Emer. Iron St'rcases, Union W'kh'se, Hillingdon	Uxbridge Guardians	W. L. Eves, A.R.I.B.A., 54, High-street, Uxbridge	do.
Materials, etc.	Greenwich Borough Council	Borough Engineer's Office, Town Hall, Greenwich-road., S.E.	Mar. 18
Street Works, Linden-road and Victoria Drive North	Bognor U.D.C.	Surveyor to the Council, Bognor	do.
Materials	Godstone R.D.C.	J. George Powell, Engineer to the Council, Godstone, Surrey	do.
Foundations of Bandstand at Woodhouse Ridge	Leeds Corporation	City Engineer's Office, Leeds	do.
Iron Superstructure for Bandstand at W'dhouse Ridge	do.	do.	do.
Electric Lighting, Gas, Heating, Ventilating	Hearts of Oak Benefit Society	Chairman of Bldg., Committee, 17, Charlotte-st., Fitzroy-sq., W.	do.
Bells and Telephones (New Offices, Euston-road)	do.	do.	do.
Lifts and Enclosures do.	do.	do.	do.
*Signal Station, etc., Alderney, Channel Islands	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
*New Coastguard Buildings, Sea View	do.	do.	do.
Reservoir, Filter Beds, etc., Flemingsdown, n'r Bridgend	Bridgend Gas and Water Co.	T. Rees, M.Inst.C.E., Corn Exchange-chambers, Newport, Mon.	Mar. 19
Additions to Ardrumsee Church, Clones	Very Rev. L. J. Canon O'Neill	W. A. Scott, Architect, 72, Hollybank-road, Drumcondra, Dublin	do.
Materials for Repair of Highways and Footways	Pontefract R.D.C.	W. A. Glover, Clerk, Union Offices, Pontefract	do.
Footbridge, Clavering	Saffron Walden R.D.C.	H. Smith, Ashdon-road, Saffron Walden	do.
Retaining Walls, etc., Monton (Contract 1)	Eccles Corporation	T. S. Picton, C.E., Borough Surveyor, Town Hall, Eccles	do.
Retaining Walls and Folly Brook Culvert (Contract 2)	do.	do.	do.
Sewerage Works, Hargarth Ings, Tadcaster	Tadcaster R.D.C.	Martin & Fenwick, Engineers, 1, Park-place, Leeds	do.
Methodist Ch. at Laghey, Killyman, near Dungannon	Rev. H. Shire	Hobart & Heron, Architects, Dromore, co. Down	do.
Road Materials	Selby R.D.C.	E. Townsend, Clerk, 1, Abbey-place, Selby	do.
Creosote Oil	N.E. Ry. Co.	E. H. Clark, Stores Superintendent, Gateshead	do.
Materials	Highways & Sewage Com., Burnley	C. H. Pickles, Borough Surveyor, Town Hall, Burnley	do.
Road Material	Driffield R.D.C.	T. C. Beaumont, C.E., Surveyor, Driffield	do.
Materials and Cartage	Horsham R.D.C.	W. Dengate, Surveyor, 58, Park-street, Horsham	do.
Condensing Plant at New Power Station	Preston Corporation	W. H. Tittenson, Engineer, 25, Burrow-road, Preston	do.
Tar and Liquor Tanks, etc., Bradford-road Station	Manchester Corporation	C. Nickson, Gas Department, Town Hall, Manchester	do.
Painting Station Buildings	North-Eastern Railway	C. A. Harrison, Engineer, Central Station, Newcastle-on-Tyne	do.
459 Yards of 9-inch Pipe Sewer	Knaresborough U.D.C.	Surveyor's Office, Town Hall, Knaresborough	do.
463 Yards of Pipe Surface-water Drain	do.	do.	do.
Ironswood Hospital	Market Harborough U.D.C.	G. O. Nicholson, Manor House-buildings, Market Harborough	do.
14,000 yds. (sup.) of Creosote White Deal Pav. Blocks	Keighley Corporation	W. H. Hopkinson, Borough Engineer, Keighley	do.
Sewer, Sandwich	The Town Council	A. J. Firby, Borough Surveyor, Sandwich	do.
Flint and Granite	Southampton Corporation	J. A. Crowther, Boro' Engineer, Market-chambers, Southampton	Mar. 21
Sixteen Artisans' Dwellings, Mallow	Mallow U.D.C.	T. Wrixon, Clk., U.D.C. Offi., William O'Brien-st., Mallow, Ireland	do.
Four Shops, Bakery, and Stable at Senghenith	Senghenith Indus. Co-op. Soc., Ltd.	G. L. Watkins, Architect, Station-terrace, Caerphilly	do.
Making Two Lancashire Boilers, Beckett-st., W'kh'se	Leeds Guardians	T. Winn & Sons, Architect, 92, Albion-street, Leeds	do.
Road Materials	Maidstone U.D.C.	T. F. Bunting, Borough Surveyor, Fair Meadow, Maidstone	do.
Stores, Gas Department	Bury Corporation	H. Simmonds, Engineer, Gas Works, Bury, Lancs.	do.
Supplies	Newport Corporation	H. C. Bishop, Boro' Electrical Eng., Town Hall, Newport, Mon.	do.
Plant, Electricity Works	Lincoln Corporation	S. Clegg, City Elec. Eng., Elec. Wks., Brayfordside North, Lincoln	do.
Twenty Houses at Aberbeeg	Tir Graig Building Club	M. Gorman, Rosslea, Llanhilleth	do.
Granite	Blaby R.D.C.	G. E. Bouskell, Clerk, 27, Friar-lane, Leicester	do.
161 Lineal Feet of c.i. Tube	G.N.R. Co. (Ireland)	W. H. Mills, Engineer, Amiens-street Terminus, Dublin	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
New Tramways	Glasgow Corporation	J. Young, 88, Renfield-street, Glasgow	Mar. 21
Brick Culvert and Relative Works	Paisley Town Council	J. Lee, C.E., Master of Works, 13, Gilmour-street, Paisley	do.
Ten Tons of Galvanised Corrugated Steel Sheets	Dundee Harbour Trustees	J. Thompson, Harbour Engineer, Dundee	do.
House in Cranford-avenue, Exmouth	Mr. G. F. Perriam	E. E. Ellis, Architect, Exmouth	do.
Alterations to Premises, Budleigh Salterton	Mr. W. F. Haymes	do.	do.
*Painting, Repairs, etc., North Dispensary	St. Marylebone Guardians	A. Saxon Snell 22, Southampton-buildings, Chancery-lane, W.C.	do.
Police Station at Thorne, near Doncaster	West Riding County Council	J. Vickers Edwards, County Architect Wakefield	do.
Street Works, Albert-road, Pontypridd	Pontypridd U.D.C.	P. R. A. Willoughby, A.M.Inst.C.E., Dist. Cl. Offices, Pontypridd	do.
Kerbs and Paving Setts	Cowes U.D.C.	J. W. Webster, Surveyor, High-street, Cowes, I.W.	do.
One-Horse Emergency Telescopic Tower Wagon	Bootle Corporation	Borough Electrical Engineer, Pine-grove, Bootle	do.
Roadworks, Bengeo, Hertford	W. F. Parker	Norris & Duval, 60, Fore-street, Hertford	do.
*Painting, etc., at Rackham-street Infirmary	St. Marylebone Guardians	Steward of the Infirmary, Rackham-street, Notting Hill, W.	do.
Twenty-eight Workmen's Dwellings, Newbridge	Abercarn U.D.C.	J. Williams, Engineer, Council Offices, Abercarn	Mar. 22
Roads, Newbridge	do.	do.	do.
Materials	Darlington Corporation	G. Winter, Borough Surveyor, Town Hall, Darlington	do.
30-ton Electric Jib Crane, Greenwich Electricity Sta.	L.C.C.	County Hall, Spring-gardens, S.W.	do.
Fire Alarms and Telephones, Leavesden Asy., Watford	Metropolitan Asylums Board	W. T. Hatch, Eng., Office of the Bd., The Emb'km't, London, E.C.	do.
Railing round Queen Victoria Statue, Piccadilly	Manchester Corporation	City Architect, Town Hall, Manchester	do.
Clean. & Paint. Chpls, L'ges, etc., L'ds & Huns. C'm'teries	Leeds Corporation	City Engineer's Office, Leeds	do.
230 Cast-iron Tree Gratings	Bootle Corporation	Borough Engineer, Town Hall, Bootle	do.
Road Works, etc., Salisbury-road, etc.	Wealdstone U.D.C.	H. Walker, C.E., Council Offices, Wealdstone	do.
Isolation Stables, Low Hall Farm	Walthamstow U.D.C.	G. W. Holmes, A.M.Inst.C.E., Town Hall, Walthamstow	do.
*Roadmaking and Paving Works	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
Materials	Hoo R.D.C.	R. P. Smyth, Clerk to Council, Strood	Mar. 23
Cement	Cheltenham Borough Council	J. S. Pickering, Borough Surveyor, Municipal Offices, Cheltenham	do.
Sewage Pumping Machinery, etc.	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham	do.
Boilers and House Refuse Destructor	do.	do.	do.
380 Yards of 9-in. Drain Pipes, etc.	Hanley, Stoke, & Fenton Hos. Board	E. Jones, Architect to Board, Albion-street, Hanley	do.
Furniture, etc., New Asylum, Hollymoor, Birmingham	Lunatic Asylums Com. of Visitors	W. Hutton, Clerk, Council House, Birmingham	do.
Bank, Kirkby Stephen	Bank of Liverpool, Ltd.	J. F. Curwen, F.R.I.B.A., 26, High-gate, Kendal	do.
Annual Contracts	Bredbury and Romiley U.D.C.	Surveyor, School Brow, Bredbury	do.
A Coaling Stage and Carriage Works, Heaton	North-Eastern Railway	W. Bell, Architect, Central Station, Newcastle-on-Tyne	do.
Work and Material	Holborn Borough Council	H. C. Jones, Town Clerk, 197, High Holborn, W.C.	do.
Sewer Work	do.	do.	do
*New Sewers, etc.	do.	Borough Surveyor, 197, High Holborn, W.C.	do.
*New Infirmary, etc., at Workhouse	Chipping Norton Union	C. Smith & Sons, 164, Friar-street, Reading	do.
Hot-Water Heating Apparatus, Town Hall, Devizes	Devizes Town Council	Borough Surveyor's Office, Devizes	Mar. 24
Masonry Bridge at Clodock over the Monnow	Dore R.D.C.	T. Llanwarne, Clerk, St. John-street, Hereford	Mar. 25
Rails and Car Shed	Keighley Corporation	Borough Engineer, Town Hall, Keighley	do.
Overhead Equipment, Cars, Cables, etc.	do.	Borough Electrical Engineer, Corp. Electricity Wks, Keighley	do.
*New Coastguard Buildings, near Plymouth	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
*Two New Wings, etc., to Infirmary	Halstead Union	Clare & Ross, M.S.A., West-street, Finsbury-circus, E.C.	do.
*Sewer, Porchester-gardens	Paddington Borough Council	Borough Surveyor, Town Hall, Paddington, W.	Mar. 26
Granite	Ramsey U.D.C.	F. R. Serjeant, Clerk, Ramsey	do.
Public Library, Drogheda	Drogheda Library Committee	Town Clerk's Office, Court House, Drogheda	Mar. 28
House, Goxhill		H. C. Scaping, Architect, Grimsby	do.
Making-up Private Streets	York Corporation	A. Creer, City Engineer, Guildhall, York	do.
Covered Ways	Tramways Committee, Colchester	H. Goodyear, Borough Engineer, Colchester	do.
Steelw'k for Renewal of Under-Bridges, Esk Via., etc.	Caledonian Railway Company	Divisional Engineer, Princes-street Station, Edinburgh	do.
Road and Sewer Work, Coniston-road, Muswell Hill	Hornsey Town Council	F. J. Lovegrove, Borough Engineer, Southwood-lane, Highgate, N.	do.
Road-making, Dorking	U.D.C.	G. S. Mathews, Town Surveyor	do.
*Precipitating Tanks, etc., at Irrigation Land	Barnet U.D.C.	Council's Surveyor, 40, High-street, Barnet	do.
*Making up Coniston-road, Muswell Hill	Borough of Hornsey	Boro' Engineer, Municipal Offices, Southwood-lane, Highgate, N.	do.
3,000 Yards of Sewers and Surface Water Drains	Chepping Wycombe Corporation	T. J. Rushbrooke, Boro' Surveyor, 77, Easton-st., High Wycombe	Mar. 29
Waterworks and Reservoir, Biggleswade	Biggleswade Water Board	G. F. Deacon, Engineer, 16, Great George-street, Westminster	do.
Laying 2,900 Tons of Pipes, and Constructing Tanks.	Biggleswade R.D.C.	do.	do.
Laying 260 Tons of Pipes, etc.	Biggleswade U.D.C.	do.	do.
*Extension of Telegraph Factory, Holloway	H.M. Works	H.M. Office of Works, Storey's-gate, S.W.	do.
*New Post Office, Hull	do.	do.	do.
Stationmaster's Ho. & Sta. Bldgs., Neill's Hill, Belfast	Belfast and County Down Ry. Co.	The Engineer, Queen's Quay Terminus, Belfast	do.
*Repairs and Painting, Public Baths and Washhouses	Islington Borough Council	Borough Engineer, Town Hall, Upper-street, N.	do.
*Three Cottages at Knowle Asylum, Fareham	Co. of S'th'mpt'n Asylum Vis. Com.	County Surveyor, The Castle, Winchester	do.
*New Coastguard Detachment, near Pembroke	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.	do.
Permanent Way and Overhead Equipment	Wandsworth U.D.C.	H. Ward, Clerk, The Council House, Handsworth, near Birmingham	Mar. 30
*Coronation Memorial		Council Offices, Ewell-road, Surbiton	do.
Chapel Maenclochog, Pembroke	Coronation Memorial Committee	D. E. Thomas, Architect, Victoria-place, Haverfordwest	do.
Clock Tower, Surbiton	Tipton U.D.C.	J. Johnson, Architect, 9, Queen Victoria-street, E.C.	do.
Fire-Clay Goods	do.	S. O. Stephenson, Engineer, Gasworks, Tipton	Mar. 31
Tubes, etc.	Sunderland Corporation	do.	do.
Indiarubber-covered Cables	Normanton U.D.C.	J. F. C. Snell, M.Inst.C.E., Town Hall, Sunderland	do.
Materials	Denbighshire County Council	A. Hartley, Architect, Castleford	do.
House and Offices, Rossett	Chailey R.D.C.	R. Lloyd Williams, County Surveyor, Denbigh	do.
*Sewerage and Sewage Disposal Works	Llandilo Fawr R.D.C.	Powell & Co., Estate Offices, Lewes	do.
Drainage Scheme, Amman Valley		E. Jones, Surveyor to Council, Glancennan, Llandilo	April 23
Rebuilding Renwick Wesleyan Chapel		H. Higginson, Architect, 3, Lonsdale-street, Carlisle	No date
Repainting Poles and Fittings of Tramway System		Tramways Manager, 1, Warwick-road, Carlisle	do.
Ten Cottages, Hereford		W. W. Robinson, Architect, Hereford	do.
Forty-four Dwelling-houses, Stamford-rd., Andenshaw		Burton & Percival, Arch's., 150A, Stamford-st., Ashton-under-Lyne	do.
Conversion of Wellington-chams., Leeds, into Shops, etc.	Trustees of the late H. M. Sykes	Messrs. Mosley, Rent Collectors, Wormald-row, Leeds	do.
Wesleyan Ch., and School Enlargement, Lowmoor		W. J. Morley & Son, Architects, 269, Swan-arcade, Bradford	do.
Painting, etc., Elec. Lt., etc., New Briggate Synagogue		Max Abrahamson, President, Byron-st. Mills, North-st., Leeds	do.
*Extension of Blacklead and Blue Mills, Kent-st., Hull		T. Brownlow Thompson, Architect, 15, Parliament-street, Hull	do.
*Making Roadway, Edmonton	Messrs. Eley Bros., Ltd.	Works Superintendent, Eley Bros., Ltd., Edmonton	do.
*New Buildings for "Dundee Courier"		Niven and Wigglesworth, 104, High Holborn, W.C.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Building Inspector	Croydon R.D.C.	150*l.*	Mar. 17
*Clerk of Works	M.A.B.	4*l.* 4*s.* per week	Mar. 22
*Assistant Surveyor	County Borough of Croydon	150*l.* per annum	Mar. 26
*Clerk of Works	Chorlton, etc., Joint Asylum Com.	4*l.* 4*s.* per week	April 6
*Assistant Examiner in Office of H.M. Works, etc.	Civil Service Commission	Not stated	April 14
*Quantity Surveyor	Lambeth Borough Council	Not stated	No date.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xvii.

TENDERS—*Continued from page 297.*

NEATH—*Continued.*

Contract No. 2 (Purchase of Old Materials).

Goodridge & Son, Neath*	£284	Williams Bros.	£228
Bennett Bros.	251	Gilbert Thompson & Co.	216

Contract No. 3 (Steel and Iron Work).

Finch & Co.	£6529	Hundyside & Co.	£5,238
Baker & Co.	6,300	Rees & Kirby	4,998
Heenan & Froude	6,200	Wood & Co.	4,990
Stevenson & Co.	6,138	Bryden & Middleton	4,900
Sands & Son	6,085	Goodridge & Son	4,880
Braby & Co.	5,945	W. H. Creighton	4,782
Rowell & Co.	5,912	A. D. Dawnay	4,781
Bennett Bros.	5,887	Boulton & Pane	4,707
Bruce & Stile	5,819	G. Thompson & Co.	4,544
Henry Parfitt	5,688	G. B. Smith & Co., Glasgow*	4,500
John Lysaght, Ltd.	5,423		

NEWBURGH.—For two cast-iron pressure filters and 2,500 lineal yards of c.i. pipes, etc., for Newburgh Town Council. Messrs. W. D. Sang & Lockhart, C.E., Kirkcaldy:—

R. & J. Gilhooly	£1,296 7 6	R. C. Brebner & Co.	£627 3 9
J. L. Wilson	1,277 3 8	Jas. Strachan & Son	624 2 1
James Walker	913 8 4	Alex. Fraser	614 0 0
Alex. Gordon	812 10 0	David Gilman	588 15 0
John Kennedy	809 9 1	Macleish, Morrison, & Co., Ltd.	570 9 0
G. Mackay & Son	723 7 8	Frew, Watson, & Co., Ltd., Mill-street, Perth*	568 10 4
John Easton	680 12 8		
Alex. Mitchell	676 14 1		
H. Hutchison	651 14 2		
J. & D. Ross	643 0 0		
Isaac Craik	635 16 8		

NORWICH.—For the erection of a public convenience at Waterlow Park, for the City Corporation. Mr. A. E. Collins, City Engineer, Guildhall, Norwich. Quantities by City Engineer:—

W. J. Hannant	£214 1 6	A. C. Taylor	£185 0 0
Thomas Gill	209 0 0	A. D. Boddy & Son	184 0 0
George Pegg	199 11 0	A. S. Lincoln	175 0 0
J. S. Smith	192 0 0		
J. J. Howes	189 18 0		

[All of Norwich.]

[City Engineer's estimate, £180.]

‡ Recommended for acceptance.

RHYMNEY (Wales).—For erection of stables, cart-sheds, fire brigade station, workshops, etc., for the Urban District Council. Mr. W. Lloyd Marks, Surveyor, 61, High-street, Rhymney:—

D. J. Roberts	£637 10	D. John Vaughan, Builder, Tredegar, Mon.*	£593 0
Evan Evans	619 10		
Tom Jones	595 0		

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RIPLEY (Derbyshire).—For 428 yards of drain pipes, 9 in. diameter, for the Urban District Council. Mr. C. W. Thompson, Surveyor, Town Hall, Ripley :—

J. Hawley & Son	£350 15 0	G. M. Kerry	£268 3 0
J. Hutchinson & Son	320 0 0	H. Ashley	265 0 0
Pegg & Bailey	317 0 0	Belshaw & Son	236 0 0
C. E. Cox	295 14 6	H. Bennett, Mansfield*	219 2 0
W. Clower	285 0 0		

[Surveyor's estimate, £220.]

ROCH (Pembrokeshire).—For vestry and other additions to St. Mary's Church, Roch. Mr. D. E. Thomas, architect, Victoria-place, Haverfordwest :—

W. Roberts £126 13 5
J. Williams, Roch, Haverfordwest* 125 15 4

SANDAL.—For about eighty tons of 6 in. c.i. pipes, etc., for the Urban District Council. Mr. F. Massie, A.M.Inst.C.E., Tetley House, Wakefield :—

J. Oakes & Co.	£466 4 6	Cochrane & Co., Ltd.	£403 8 9
D. Parsons & Sons	463 2 9	Stanton Ironworks Co.	394 1 0
Cochrane & Co.	460 10 2	J. & R. Ritchie	390 7 0
E. & W. H. Haley	432 16 6	Sheepbridge Coal & Iron Co., Ltd.	388 14 2
J. Oakes & Co.	422 12 2	Staveley Coal & Iron Co., Ltd., near Chesterfield*	384 16 6
A. G. Cloake	420 10 7	Clay Cross Co.	383 1 2
Holwell Iron Co.	417 9 8		
J. Needham & Sons	414 11 1		
Biggs, Wall, & Co.	408 8 9		
Birtley Iron Co.	407 11 6		

SELSTON (Nottinghamshire).—For sewerage and sewage disposal works. Messrs. Sands & Walker & Maylan, joint engineers, Milton-chambers, Nottingham :—

Morley & Son	£26,337	H. Ashley	£22,899
G. Braithwaite	25,275	F. W. Trimm	22,635
J. Jackson	25,784	Johnson & Langley	21,257
J. F. Price	25,770	C. M. Kerry & Co.	21,200
J. Hawley & Son	24,994	Cope & Rayner, Nottingham	20,524
J. S. Dawson	24,448	J. Lane‡	16,225
Barker Bros.	24,332		
J. Hodson & Son	24,183		

‡ Withdrawn.

SPILSBY (Lincs.).—For supply of 6,000 tons of broken granite, 7,500 tons of broken slag, and 600 tons of chips or gravel, for the Rural District Council. Mr. T. A. Busbridge, C.E., Spilsby :—

	Average Price per Ton for 1½-in. Material. s. d.
Granite.	
M. Jackson (Quenast Granite) Louth*	12 0
Robinson Bros. (Brandon Hill Granite) Spilsby*	13 3
Mountsorrel Granite Co., Mountsorrel*	12 0
Groby Granite Co., Groby*	12 1
Grimley & Co. (Cliffe Hill Granite), Sutton Bridge*	12 7
Forest Rock Granite Co., Ltd., Whitwick*	12 0
London Basalt Stone Co., Ltd. (Basalt Stone) London*	12 9
Fergusson & Starkey, Leicester*	12 3
Whitwick Granite Co. (Best quality), Whitwick*	12 2
L. Roper (Enderby and Stoney Stanton Granite), Boston*	12 0
Slag.	
Islip Iron Co., Ltd., Thrapston*	7 11
Grimley & Co. (Best Kettering Slag), Sutton Bridge*	8 7
Ellis & Everard, Ltd., Tallington*	8 4
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Francis Stevens 390

[All of Swanage.]

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F. Gough & Co.	1,184		
Geo. J. Hosking	1,127		
Charles North	1,087		

STRATFORD-ON-AVON.—For the erection of a detached villa in the Avenue-road, for Mrs. F. H. Hastings. Mr. E. G. Holtom, architect, 58, Henley-street, Stratford :—

Wm. Linaman, jun.	£1,397	Jno. Harris & Son	£1,040
J. G. Fincher & Co.	1,200	E. J. Kennard, Stratford-on-Avon*	966
G. Euston	1,076		
J. Ward & Co.	1,050	John Roberts	869

TARBERT.—For the construction at Balamenach, West Loch, Tarbert, of two filters and a service tank, and for pipes, etc., for the Tarbert Water Committee. Messrs. Warren & Stuart, engineers, 94, Hope-street, Glasgow :—

Thomas Christie, contractor, Stirling* .. £1,891 9 4

TILEHURST (Berks).—For the erection of an infectious diseases hospital, Prospect-park, Tilehurst, for the Reading Borough Council. Messrs. C. Smith & Son, architects, 164, Friar-street, Reading :—

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J. Dallow & Sons	18,580 0 0	65
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F. Newberry	18,399 0 0	60

WALSALL.—For extension of boiler house of generating station in Wolverhampton-street, for the Corporation. Mr. A. Wyllie, Borough Electrical Engineer, Wolverhampton-street, Walsall :—

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The Builder.

VOL. LXXXVI.—No. 3169 MARCH 19, 1904.

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Old Well at Villeneuve-les-Avignon ..... Drawn by Mr. J. Percy Wadham.
Entrance Hall, "Elveden" ..... Mr. Clyde Young, A.R.I.B.A., Architect.
House on the Hadley Road (Garden Front) ..... Mr. A. H. Hart, A.R.I.B.A., Architect.
Sketch for House, Isle of Wight ..... Mr. Geo. Scorer, A.R.I.B.A., Architect.
House, 37, Cheyne Walk, Chelsea ..... Mr. C. R. Ashbee, Architect.

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How to Judge Architecture.

TO undertake to show how to judge of architecture is a rather serious programme even for a book, still more for a short article, though it can hardly be said that the undertaking is superfluous, either as regards the public or the profession. The public, we know, with a very few occasional exceptions among people who have given more than usual attention to art, are without any principle or standard whatever in regard to their likings and dislikings in architecture, which seem to be ruled mostly by the consideration whether a building is like what they are accustomed to. If it is, it strikes them as all right; if it is not, they do not know what to think, but in general conclude that it must be wrong. Architects can give reasons, to themselves and others, for their judgments; but we do not know whether it can be maintained that they always do so. They also, in this country at least, are rather too much dominated by fixed preferences for a special style or a special school of treatment. If a design illustrates their favourite method it has their sympathy; if not, it is dismissed as not worth consideration. There is a want of critical detachment in such an attitude. One may honestly think, for instance, that classic orders are out of date, and that one prefers a more free and picturesque treatment. But this conviction ought to be quite compatible with a perception that a building in a style we do not sympathise with may nevertheless represent a good and complete architectural conception of its kind, in which plan and design form a satisfactory whole. A building may be judged to be good or to be bad from its designer's point of view; but we must recognise the point of view, even if it is not our own. Otherwise, what should be judgment is apt to degenerate into prejudice.

As we have said, the heading is a rather large one for an article; but it is not our own, it is borrowed from a book,* in which an eminent American architectural critic offers to give the general reader such instruction as may put him in a position to form his own judgment on architectural design. A book might very well be written on such a plan; but in the present case we do not think the title exactly expresses the real scope of the book, which is, in fact, a broad sketch, in ten chapters, of the history and development of one style from another—from Greek architecture down to modern times. Egyptian architecture is omitted from the scheme, and not without reason, since it can hardly be said to have influenced the subsequent development of architecture. Everything begins from Greek architecture. Critical remarks arise here and there out of the conduct of the subject, but not in accordance with any obvious or pervading line of argument. Mr. Sturgis may reply that to give people a general idea of the historical development of architecture is to give them the best basis for forming a judgment on it; and much is to be said for that view. But it pre-supposes that readers will bring more thought of their own to bear upon the subject than is generally to be expected from those who read a book for information on a difficult subject that is new to them. It may also be urged that "How to Judge Architecture" is an excellent publishing title; for which still more may be said. Who would not read a short book which promises to make him a judge of a great subject?

Apart from any question of the significance of the title, the book is a good one, which architects may read with interest and the laity with profit; and it occasionally suggests considerations which, if not absolutely new, are well worth emphasising.

Mr. Sturgis takes Greek architecture for his point of departure on the ground that "it is well to take for our first study some buildings of that class about which there is the smallest difference among modern lovers of art," while he points out that this perfection of the Greek temple of the best period is to some extent due to the extreme simplicity of the architectural problem. Also he cautions the reader against judging Greek art by the picturesque and romantic aspect of its half-ruined remains. The Parthenon, as we see it in its decay, is a most picturesque and charming ruin, with a great historical and poetic tradition; but "it was not to produce such a ruin as we now see that the Grecian artist thought and toiled. Admire the ruin to your heart's content, but do not allow too much of this romantic association to enter into your love of the artistic entity, of the lost Parthenon, which we have to create out of the air, as it were." This is very well

* "How to Judge Architecture: A Popular Guide to the Appreciation of Buildings." By Russell Sturgis, A.M., Ph.D. London: Macmillan and Co. 1904.

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put, and what is often forgotten; and we may add that we think such a caution not unnecessary even in regard to the more romantic monuments of mediæval architecture. People are so accustomed to study the cathedrals in their now time-worn state that they seem often to forget that these buildings were once brand new—clean, sharp, and hard in their lines, and that some portion of their picturesque and romantic effect is due to surface decay. The chapter on Greek architecture as a whole is excellent, but we notice one characteristic omission. In regard to the curves and other refinements of adjustment of the Parthenon it is stated that "great folios of carefully drawn plates have been devoted to the exact curvature of the entasis and to the more recently discovered irregularities; and a minute series of measurements have been made, by which the whole amount of the irregularity in any one case is now easily ascertainable"; but the fact that these "great folios" and "careful measurements" were made by one man, and that man an English architect, is suppressed. This is the second or third time—certainly not the first time, that we have noticed references in American books to Mr. Penrose's work on the Parthenon without their author being given the credit of them. We wish we could think that this was mere ignorance. We may add that if the restored model of the Parthenon, in the Museum of Art at New York, shows the entasis of the columns so as to be prominently evident in the illustration given, where the nearest column is only $1\frac{3}{4}$ in. high, the entasis must be much exaggerated in the model, and the impression conveyed to the reader is incorrect. The entasis is hardly perceptible to the eye in a photograph from the building of three times that size. In fact, it seems to have been part of the refinement of the Parthenon that the entasis should not be prominently visible; it was rather a correction of the tendency to an apparent hollowness of outline.

In the second chapter, on Late Greek and Roman design, a useful distinction is drawn between the two different ways of judging of Greek buildings—the historical and critical view of them, as buildings "once very real and really put to use," and the modern traditional way, "by means of which a small body of writers and lecturers swayed architectural opinion for a century and a half, and until the accurate examination and close study given to the subject in the second half of the XIXth century had produced its effect." The author goes on, however, to point out the greater direct effect upon modern architecture of the Roman version of Greek columnar styles, through which alone the Renaissance architects knew the latter at all. Mr. Sturgis wishes to substitute for "Renaissance" the Italian word "Risorgimento," wishing that to be applied to the Italian movement and Renaissance confined to the French work; but though this may be historically and philologically correct, it is too late for that now; "Renaissance" is an adopted English word with its own acquired and fully recognised meaning; to adopt "Risorgimento" seems rather pedantic. Besides, the French Renaissance, the Renaissance all over Europe, was due directly to Italian influence, and the word "Renaissance" expresses the whole movement throughout the European world.

We need not follow the author through his chapters on early and central mediæval design and on Byzantine architecture; their main history and characteristics are well outlined. In regard to the Byzantine style, he touches on the peculiar absence of exterior effect in St. Sophia and other typical churches of the style, and suggests the cause of it, perhaps rightly, in the prevalent character of Levantine street architecture, or want of architecture. The blank outer walls are merely a screen to an often rich interior; so that architecture altogether had come to be regarded rather from the interior than the exterior. In an American book on architecture, it is a satisfaction and a surprise to find any recognition of the beauty of English Gothic, and an illustration of Salisbury given as an example of that rare incident—a mediæval cathedral complete according to the original intention or nearly so; attention having been drawn to the incompleteness of all the French cathedral, no doubt partly accounted for by their more ambitious scale. In the chapter on Late Mediæval design, we notice a good remark, introduced incidentally, in regard to the manner in which design came to supersede constructional character. "Jacopo Sansovino and Christopher Wren were great builders, but their designs were not in any special way the better for that. Their work is marked everywhere with the modern characteristic of being designed abstractly, and as if intended to be carved out of a single block, and afterwards put into terms of mortar-masonry and cut stone, because that was the only way in which the builders of the time could proceed." Very true, and that is exactly one of the radical differences between Renaissance and mediæval architecture. But, after all, may not the same be said of Greek architecture? Was not that conceived as abstract design, and is there not considerable evidence that the Greeks endeavoured as far as possible to obliterate the unavoidable jointing of masonry in their temples? There was no sham construction in Greek architecture, certainly, as there is in St. Paul's; but it can hardly be said that Greek architectural design, any more than Renaissance, was a design evolved from conditions of masonry construction.

A point noticed in the chapter on Revived Classic, and which has been rather overlooked, is that the first introduction of the applied pilaster in Renaissance architecture was evidently not regarded altogether as a success; that the Rucellai façade, with its exceedingly mechanical pilaster design, was thirty years previous to the Strozzi and Riccardi palaces. As Mr. Sturgis remarks, "It is surprising to see how much common-sense there was among these early lovers of the antique grandeur." The remarks on St. Peter's are good, and rather novel in their suggestion, and should receive attention.

The later chapters of Mr. Sturgis's book, on the modern revivals and modern architecture, contain a great deal of thoughtful criticism, and they are the portions which best fulfil the title of the book in showing "how to judge architecture." Among passages that we marked for reference are one on page 165, on the influence of fashion in the liking and disliking of certain details; that on page 167, recommending the reader not to dismiss an attractive or even impressive building on the easy judgment of the guide book, that "this is of a late date, or a corrupt style"; that styles not to treated with grave consideration may be charming in their more perfect moments; that "it is only the rational styles, based on structure, which in architecture have any uniform greatness." We may also draw attention to the distinction pointed out (p. 187) between the methods of imitation in XIXth. century architecture and those of the Renaissance architects; the latter, as has been observed more than once in these pages, were not mere copyists; they made new and original use of the materials drawn from the great quarry of ancient Rome. The differences between the modern architectural temper and method in different countries are briefly and well analysed in the concluding chapter, with the conclusion (which we hold to be perfectly sound and to the point) that under present circumstances "thought must replace the lost tradition."

Whether or not the perusal of Mr. Sturgis's book will fully equip the general reader as a judge of architecture, it will, at all events, give him considerable help towards it. The literary style is clear and agreeable, and the reader's comprehension is assisted by numerous illustrations from photographs; but there are no plans—a very serious defect in an attempt to help people to form a sound judgment on architecture. We suppose it is feared that plans would frighten away the popular reader, but that is rather a weak concession to his feelings, seeing that to understand the meaning of a plan, and its relation to the design, is exactly one of the things that people most need to be taught.

Since we have adopted Mr. Sturgis's title as the heading of this article, let us conclude with a word as to how architects should judge architecture. One may begin with one or two negatives: not on the mere consideration whether it is your own favourite style; not in respect of picturesque effect unconnected with plan; not on the question whether the architect is one of your own "set" (which seems to give the cue to a good deal of so-called criticism). Perhaps the questions to put to oneself about a design or a building, to come to a "judgment" on it, may be formulated thus:—(1) Is the plan adapted to, and does it arise out of, the purpose of the building? (2) Has the plan a distinct ruling purpose or idea in it, in addition to its practical suitability? Otherwise it is rather building than architecture. (3) Does the exterior design arise out of and express the plan and structure? (4) Has it also a distinctive governing idea? But if No. 2 has been answered in the affirmative, then the affirmative to No. 4 follows necessarily on that to No. 3. (5) Does the detail show refinement and careful study? The latter is one of the most important points of all. Perhaps more modern buildings are spoiled, and fall short of being architectural art, through

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careless, commonplace, and mechanical detail than through any other cause.

And as a rider it may be added—judge old buildings as you would judge modern ones. The tendency to accept or admire anything because it is ancient is an amiable but a mischievous weakness, and subversive of sound architectural judgment.

NOTES.

The Revival of English Canals.

THERE is no doubt that one of the most important matters awaiting attention in the present day is the improvement of the existing canal systems, which might be reorganised to the great benefit of trade and commerce. A complaint frequently made by manufacturers is that they are seriously handicapped in competition with foreign rivals by excessive railway rates. Agitation sometimes results in the granting of small reductions, but still no substantial relief is given, nor can it be expected. The liberation of the canals from the stifling control of the great railway companies would be the first step towards affording the necessary relief, but considerable alterations in the existing waterways would be necessary before they could be of much use. An excellent scheme for the reconstitution of the canals has recently been submitted to the members of the Liverpool Chamber of Commerce, and there really seem to be no engineering difficulties to prevent its realisation. The proposal is to make the canals at least 6 ft. deep, with an average width of 80 ft., and to provide them with locks 235 ft. long by 32 ft. wide, large enough for a tug and five barges to pass at one time. The scheme in question relates to the improvement of 240 miles of canals connecting the most important manufacturing and mercantile districts of the country. The cost would be no doubt heavy, but the benefit to be reaped in the reduction of freight charges would probably be sufficient to justify the necessary expenditure.

The Commissioners of Woods and Forests.

IT will we think surprise a good many persons to know that not only do the Commissioners of Woods and Forests sell property of the Crown, but that they not seldom buy other property. We should say that while it is not desirable for the Crown to sell property, except when this can be done advantageously, yet that it is undesirable for the estates of the Crown to be increased even on the score of expense of management alone. It is better that the money realised by sales of property should be held in Consols or other securities. According to the Report for 1903, the Commissioners during last year sold 78,000*l*. worth of property, the chief item of which is 36,000*l*. for Nos. 16 to 21, Cranborne-street. On the other hand 77,000*l*. has been spent on the purchase of property. Here the principal items are 58,000*l*. which was paid for freehold premises, Nos. 172A, 174, 176, and part of 178, Regent-street, and 60, King-street, and 10,000*l*. for 152a. 1r. 9p. of land and a fishery in the Thames at Datchet. Incidentally the value of Thames-side land is illustrated by the fact that the Commissioners sold about one acre of land and a cottage thereon near Boveney Lock for 500*l*. But the point which we desire to suggest for public consideration is whether the purchase of land and other property by the Crown is in itself desirable. Why should a large property in the Thames Valley be purchased, adding to the land held by other than individuals? The holding of land by a Government Department lessens freedom of movement in the transfer of land, introduces in rural districts absentee landlords, and causes hard-and-fast rules of management to prevail.

The Rating of Land Values.

THE Land Values (Assessment and Rating) Bill has passed its second reading, and been referred to the Standing Committee on Law. What its ultimate fate will be remains to be seen, but the principle of rating on fictitious values is a serious innovation not likely to be accepted without consideration. That the municipalities whose extravagant policies have so increased the rates and damaged their own credit should favour a scheme which opens up a new prospect of their being able to continue this policy, and to enable them to obtain funds which under existing conditions they can no longer do in the market, is but natural. The building speculator also must consider the measure in all respects admirable, but how will it affect the community at large? Why should a fictitious value for rating purposes be placed on land and a penalty be imposed on properties not required for building according to the ordinary principles of supply and demand? In an already thickly-populated country is such a course expedient, and how do the municipalities justify their zeal for this measure whilst they themselves are expending large sums out of the rates to secure open spaces, often at fancy values, alleging such an expenditure to be an absolute necessity for the public health near cities and congested areas? The brevity of the debate seems to point to the fact that the Bill is not likely to survive, but its importance to the general public cannot be overlooked.

The Building By-laws Reform Association.

WE welcome the first report of the Building By-laws Reform Association, the office of which is at 45, Parliament-street. One reason why we do so is because unquestionably the progress of sanitary reform is hindered instead of advanced by by-laws and regulations which irritate when they are not needed. Some of the by-laws and rules which are now made obligatory in rural districts are wholly out of place, but it is difficult for an individual to obtain their alteration, though if assisted by an association it is possible. The present report gives an instance of the pedantry of these rules. A local authority sought to remove a billiard-room attached to a country house standing in its own grounds because it was not built of brick. There is also no doubt, as pointed out in this same report, that pedantic by-laws prevent the rehousing of the poor in rural districts. Cottages should, of course, have a good water supply and healthy sanitation, but there is no necessity for local bodies to make all sorts of rules and regulations which increase the cost of cottages without adding to their actual improvement from a sanitary point of view. Indeed nothing is more remarkable than the laxity of many local authorities in enforcing elementary rules of sanitation and water supply and their strictness in regard to unnecessary by-laws.

Decisions under the Public Health Acts.

TWO SHORT points may be noted on the Public Health Acts this week. In the case of London and North-Western Railway *v.* Mayor, etc., of the City of Westminster (*The Builder*, *ante*, p. 293) the point decided by the Court of Appeal is a simple one that where a sanitary authority provides public conveniences, for which purpose section 44 sub-s. (2) of the Public Health (London) Act, 1891, vests the subsoil of any road, exclusive of the footway, in them, they must strictly confine themselves to the powers conferred by the section. In this case the public conveniences were capable of being used as a subway as well as lavatories, etc., and this was held to constitute something outside their powers. The second case, Wing *v.* Epsom Urban District Council, decided a purely technical point. Under section 96 of the Public Health Act, 1875, the Court of Summary Jurisdiction had issued an order calling upon the respondent to abate a nuisance. Under section 251 the Court had been constituted of two or more magistrates at the hearing, but only one of them had signed the order. The respondent had the somewhat negative satisfaction of proving the order to be invalid because it had not also been signed by at least two magistrates.

New Motor-car Regulations.

THE new regulations issued by the Local Government Board to the local authorities in respect to motor-cars only call for short comment in these pages. Clause V. is a move in the right direction, since it is directed to checking the noise often made by stationary cars, which seems to try the nerves of horses which have no objection to the cars whilst in motion. The car must now be so constructed that when stationary the machinery shall make no noise. The Board have considered the question of the excessive brilliancy of the lights now used on motor-cars, but at present have made no regulation on the subject except to prohibit the use of search-lights. We have already drawn attention to the serious danger attendant on using lights unnecessarily brilliant, and are glad to see this matter is still to receive the attention of the Board, which, in a circular accompanying the regulations, recommends motorists to take voluntary action in the matter, and to thus render a regulation unnecessary. The maximum width of motor-cars is increased from 6 ft. 6 in. to 7 ft. 2 in., but the question of any increase in weight remains under consideration.

Electric Lighting Networks.

THE interesting paper by Mr. W. E. Groves which was read before the Birmingham local section of the Institution of Electrical Engineers this week treats of a subject the importance of which we pointed out six or seven years ago. If it

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be important in Birmingham to measure the insulation resistance and the leakage losses from direct current networks it is no less important in London. Mr. Groves treats the subject from the Central Station engineer's point of view, and, regarding the interruption of the supply as the greatest catastrophe that can happen, describes various heroic methods of continuing the supply even when there is a bad fault on one of the mains. Some of these methods involve making temporary connexions which will make the consumers' meters run backwards until the necessary repairs on the mains have been made. The records of the meters cancelled by these methods he rightly regards as a small price to pay for keeping up the reputation of the supply company. The numerous cross connexions in large networks make it extremely difficult to localise faults, and we think that some of the "rough-and-ready" methods advocated by Mr. Groves will be found in practice more valuable than the elaborate methods described in text-books. The author has invented an instrument which reads the insulation resistance of the whole network directly when connected to the mains. There can now, therefore, be no excuse for engineers refusing to publish this figure. It will be very interesting to know what these figures are for the distributing systems in London. When they are published we can easily calculate the maximum and minimum possible values of the electrical energy lost by leakage, and also—which will interest the water and gas companies more—the maximum and minimum values between which the actual leakage currents must lie. Tests that we made a few years ago proved that these currents were in some cases very large. Seeing that no complaints are made, we can only suppose that although these currents are large individually, yet, compared with the amount of metal buried underground in London, they must be infinitesimal. They must, however, have done damage at particular points.

Institute of Architects of New South Wales.

WE have received the first number, dated January 1 of this year, of the *Journal* of the Institute of Architects of New South Wales. It is got out in a handsome form; though we do not like, in a decorative sense, the twisted and contorted tree trunk which ornaments the cover. The elevation of an Ionic temple in the rear-plane, with radiations from it, may be taken as an appropriate piece of symbolism, indicating that here also the architectural wilderness may be made to "blossom with the Grecian rose," but the tree is anything but Greek in decorative principle or style. The first article, "The City Beautiful," is on the subject of Art Commissions to provide the adequate architectural treatment of cities (in part suggested by Sir W. Emerson's paper on "The Necessity for Official Control over Architecture"), and concludes—

"We have very great need of a new and comprehensive Building Act, for it is absolutely essential that our buildings should be constructively strong and sanitary; but some form of artistic control would seem to be of at least equal importance. An Art Commission on somewhat broader lines than that of New York would have power to exercise this control, and while the cost to the city would be trifling, the gain would be far-reaching and incalculable."

The new central railway station in course of erection at Sydney is the subject of an article and an illustration. The design appears to have been prepared in the Department of Public Works, and no architect's name is given; as a whole it is a dignified and pleasing design on classical lines, superior in general effect to many large railway stations in England; of the details one cannot, of course, judge from a perspective view on a small scale. Mr. H. D. Souter writes an article on "Architectural Sydney from a non-architectural point of view"; he is bitterly satirical, and probably with good reason, against the architecture and sculpture of the past quarter of a century, but looks forward to a good promise of improvement. An article on the competition for the Australian Mutual Provident Society's new premises at Melbourne gives illustrations of some of the designs. That by Messrs. Sulman and Power, placed first, is a piece of refined and well-balanced classic work; that of Messrs. Robertson and Marks is commonplace; that of Messrs. Hall and Dods, though perhaps rather too fortress-like, shows a certain power and originality. From the Report of the Council, at the end of the *Journal*, we learn that the Institute now numbers thirty-six Fellows, twenty-seven Associates, one Retired Fellow, six Honorary Members, and fourteen Students, making a total of eighty-four. For a Society so limited in numbers this publication, if it is to be carried on monthly, is a most spirited effort, and we wish it every success.

The Leicester Galleries.

AT the Leicester Galleries is an exhibition of water-colour drawings of Venice by Mr. Mortimer Menpes. We fear it must be said that architectural subjects are not Mr. Menpes's strong point. He has a great eye for colour, but not apparently for form—architectural form at all events. In various drawings in which the Salute Church appears it is dreadfully maltreated—hardly recognisable, in fact. In "St. Mark's Basin" (27) the Campanile is all crooked; but too many painters have that way with them; they seem to think as long as they have the colour of a building it is no matter whether it stands straight or not. Where Mr. Menpes succeeds is in small bits of the house fronts, treated almost in elevation, in which the colour of materials is the predominant interest; and some of the picturesque out-of-the-way corners of Venice are well shown. But the architectural glories of Venice can hardly be said to be adequately illustrated in this collection.

Modern Gallery.

IN a small room called the "Modern Gallery Annexe," at 175, Bond-street, is another collection of illustrations of Venice, "The City of the Waters," by two ladies, Miss Mary and Miss Lydia Pringle. Here, again, we find that with a great deal of perception of the picturesque in outline and colour, the drawings showing important architectural monuments are failures, at least, where a near view is attempted, though there is a very pretty distant view of San Giorgio (21) by Miss Mary Pringle. The drawings of picturesque corners in the smaller canals are, however, many of them, very good in colour and composition. We may mention especially Nos. 16, 28, 30, and 31, by Miss Mary Pringle (the last-named, "Desdemona's house," a much better finished architectural bit than any others in the collection), and Nos. 10, 11, 36, and 46, by Miss Lydia Pringle.

The Greek Play, Bradfield.

THE triennial performance of a Greek play in the open-air theatre at Bradfield College comes round again this year—an event always welcome. On this occasion the *Alcestis* of Euripides is to be the play; it has been given before in the same theatre, but we presume the actors in that representation will have given place to new-comers, as the parts are all played by pupils at the school. The instruments used will be harps of ancient model and scale, and flutes copied from those found at Pompeii; in outer appearance that is—whether they sound like those of Pompeii, who can say? The days of performance are Tuesday, June 21, Thursday, June 23, Saturday, June 25, Monday, June 27, and Tuesday, June 28. Further information can be obtained from the Hon. Secretary of the Greek Play Committee, Bradfield College, Berks.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, Mr. A. Darbyshire, F.S.A. (Vice-President), Manchester, in the chair.

The late Dr. Murray.

Mr. Alex. Graham (Hon. Sec.) said he had to announce the decease of Mr. James W. Twist, of Bloemfontein, South Africa, who was elected an Associate in 1891. He had also to announce with very deep regret the decease of a highly esteemed and distinguished hon. Associate, Dr. Alexander Stewart Murray, Keeper of the Greek and Roman Antiquities at the British Museum. He was sure that no words of his could strengthen the expressions of opinion recorded in the daily Press of the meritorious career of Dr. Murray. As architects they were under a debt of gratitude to Dr. Murray for his kind services and his co-operation with them in matters in which he was a master. Dr. Murray was acquainted with almost every branch of classical archæology, and in one in particular he was the authority pre-eminent, which was that of Greek sculpture. He need not add anything with regard to his literary achievements, because they were known to nearly all of them. He might, however, say this, that there was nothing which Dr. Murray touched in which he did not achieve success. As a close reasoner and very thoughtful observer, Dr. Murray belonged to a type of students that he was afraid was diminishing in numbers rather than increasing, and that was due perhaps to the rapidity of movement in modern times and to the hurry in which most things were done. It was for that reason that they deplored the loss of so distinguished a man as Dr. Murray. Many of them who came in contact with him, not only in those rooms, in which he was a familiar figure, but in his official capacity at the British Museum, had good reason to look upon him not only as a friend but as an adviser who was ready to impart information on many subjects in which he was a master. To those who came in contact with him Dr. Murray would always remain a pleasant memory. The members of the Institute who saw him at those Rooms would always think of him as a kind friend and as a learned man. As an Institute they could not do less than record their feelings by a sympathetic letter to his widow and relatives in recognition of the kind services he rendered them, and also in full appreciation of his great work during a long career in the cause of classical archæology. He

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therefore asked them in silence to approve of a letter being sent to Dr. Murray's relatives expressing their feelings of so good and learned a man.

The motion was agreed to in silence.

Plaster Decoration.

Mr. J. D. Crace then read a paper on "Plaster Decoration," of which the following is an abstract:—

Touching the origin of the plastic art, the author said it was reasonable to suppose that such fictile substances as clay were wrought into form even before man learned to bake earthen vessels. The mud-built houses of man, even in a barbaric state, could not have been void of all attempt at ornamentation when the material itself offered such facilities. The surface of mud-brick walls must soon have been "rendered" with a coating of the same material, which, whilst moist, would readily receive any impress—the imprints of the workman's hand, marks left by his rough tools; a chance symmetry would lead him to intentional device, impressed by his fingers or traced with a stick.

The use of stone led to the demand for some material which would adhere to stone and give a uniform surface, and this was found in simple compositions having burnt lime as the binding ingredient. Plaster, in the form of a very fine, smooth, coating of lime-putty, was used to give a finished surface to the stone structures of Egypt in very early times, but does not seem to have been much used plastically for ornamentation. It was similarly used by the Greeks, and the author gave reasons for his inference that stucco was used decoratively in an early period of Greek history. Among the many wonderful revelations of Mr. Arthur Evans's explorations in Crete are the stucco decorations in relief of the walls of the Palace of Knossos which was destroyed before 1500 B.C.

Beautiful specimens of decorative stucco-work have been unearthed in excavating the ancient sites of Rome and the surrounding country. The author referred to those at the Baths of Titus discovered in the XVIth century, to those at Herculaneum and Pompeii, and to the decoration of two sepulchral chambers discovered on the Via Latina dating about A.D. 160. In the Farnesina grounds remains of buildings have been unearthed with stucco reliefs unsurpassable for elegance and refinement of execution. One great value of these works is the lesson they teach in the adjustment of the actual treatment in execution to the nature of the material. The whole surface speaks aloud of the ready and dexterous use of fingers and tools on a light plastic material. One almost imagines the stucco yet moist, still impressible to the touch. It is as if some fairy goddess had found it soft and lightly fingered it. There is a sense of evanescence about it, whilst the charm of perfect attainment remains.

The author then turned to a very beautiful but very different growth of plaster decoration developed under the Mohammedan conquerors, describing the decorations of the great Mosque of Ibn Tooloon at Cairo (IXth century). In the Arabic art of Egypt plaster continued to be used as an important factor in decoration during the next five centuries. The ornamentation of the domes and the use of a fine stucco in low-relief ornament, as a preparation for gilding and colour on the wooden beams of its flat roofs, are specially noteworthy. The palace of the Alhambra is the very apotheosis of plaster—of plaster casting carried perhaps to an excess of richness and elaboration, but never losing its true quality of ornament designed purposely for casting. The beautiful effects of a mere repeat casting the author thought were attained because (1) the designers thoroughly understood grace of line and how to fill their spaces; (2) they never lost sight of the fact that the work was to be cast; (3) most important of all, the repetition did not include the representation of natural objects, for it is where representations of nature are concerned that repetition is offensive.

In European art during mediæval times we get little glimpse of the decorative use of stucco until the XVth century. An original and striking example is to be seen in the drum of the dome of San Eustorgio at Milan, the work of Michelozzo Michelozzi, of Florence, said to have been executed in 1462. In the second half of the XVth century Bernardino Pinturicchio was making considerable use of low-relief enrichments, not only for the mouldings with which he divided the surfaces he had to decorate, but as ornamental features within the paintings themselves. A few years after Bramante was at work on St. Peter's. His investigations, says Vasari, resulted in the discovery of the method of preparing stucco employed by the ancients, the secret of which had been lost in their ruin and remained concealed ever since. Vasari relates how Raffaelle and Giovanni da Udine went together to see some subterranean chambers then just discovered in excavating the Baths of Titus. Giovanni was so much impressed by the stucco decorations with which they were covered that he devoted himself to their study, and reproduced them with so much grace and facility that there was only now wanting to him the knowledge how to compound the stucco. At length, by compounding finely powdered white marble with the lime from white travertine, he succeeded in producing the stucco of the ancients. Raffaelle at once caused Giovanni to decorate all the vaultings of the Papal Loggie in stucco. Pierino del Vaga, another of that wonderful band of young artists in the Vatican, stands pre-eminent as an ornamentist and as a decorative colourist; his stucco-work has a quality of fine decorative appropriateness, both in design and scale, that has been surpassed by none. Of his bolder conceptions the great ceiling of the Sala Regia is a fine example. Alessandro Vittoria was one of the best-known stucco-workers in the latter half of the XVIth century. His work under Sansovino at Venice, in the Libreria, and in the Scala d'Oro of the Ducal Palace are characteristic examples of his style.

Francis I. attracted to France some of the most capable of the Italian artists skilled in stucco. Primaticcio and Il Rosso came about 1530, and their wonderful stucco decorations at Fontainebleau long influenced French design and French sculpture. Niccolo dell Abbate followed twenty years later, and then his three sons, the youngest becoming after a time the director or manager of these decorative works. Their work is a fine field for the study of what may be done in stucco, and it was the parent of the rich decorations of Louis XIV.'s reign, which, in their turn, became the model for civilised Europe.

Henry VIII. was also very successful in securing the services of able artists in England, many of them pupils or relations of those who were at work on the masterpieces of the Vatican. Pietro Torrigiano, who was among the earliest, completed the bronze monument of Henry VII. in 1519.

It was to the Palace of Nonsuch that the new stream of talent was directed; although not a vestige of it now remains, the names of some of the men who adorned it are a guarantee that the work was neither coarse nor commonplace. As to the question lately raised about the external panels of Nonsuch being in stucco, the author said there was not the smallest doubt on the subject. There were plenty of examples done more roughly within the next seventy or eighty years which remain to this day, in spite of exposure and neglect.

External decorative work in plaster continued to be a feature of many English houses down to the end of the XVIIth century. But the interior was the more important field, and from the time of Nonsuch for a century no house of any pretence was without its elaborate plaster ceiling and frieze. Admirable in many ways as these old English ceilings are, few of the men who did them had either the art or the skill of the Italians who made ornamental plaster-work popular. The latter endeavoured to make their work perfect in modelling and finish. Each figure was a work of art. In the English plaster-work, however, scarcely a figure can be found that is not more or less barbaric in execution, and the minor work, effective as it is, is often greatly wanting in grace of line and in intelligent modelling.

The next step in English plaster-work leads straight to the classic work of Jones and Wren. The gap caused by the Civil War made the change more complete. Building operations after the Great Fire opened the way to new men and methods. French and Italian plaster-workers were again invited to England in Charles II.'s reign. Besides the work in St. Paul's, St. Stephen's Walbrook, and other City churches, the chapel of Trinity College, Oxford, may be cited as a good typical specimen of plaster ornamentation. A feature of some of the plaster decoration of the end of the XVIIth century is the elaborate modelling of fruit, flowers, and foliage in full relief, often in parts quite detached from the grounds, and either supported by wires embedded in the plaster or by small sticks of tough wood. This work, full as it is of artistic ingenuity and clever modelling, was by that very ingenuity departing from any true principles of stucco-work, and therefore hastening the decay of the art. A notable example is the ceiling of the Chapel of the Royal Hospital, Kilmainham.

The next modification of style was largely due to Kent. In his designs the plaster ornamentation is mainly used as architectural enrichment, bold in treatment—sometimes too bold for the space, but effective in its way. Following closely on Kent's work came a flood of plaster ornament derived from the French work of the time (Louis XV.). This was sometimes very good—often straggling and purposeless, yet not without a certain elegance. The best of it was at least partly modelled, but the greater part was cast and fixed. With this style stucco modelling practically came to an end. All that followed was cast and fixed.

The change of style brought about by the brothers Adam was due to the same influence which had produced the detail of the Vatican Loggie and the Villa Madama—namely, that of the antique stucchi in the excavated ruins in Rome. The difference in the result may be thus accounted for. Giovanni da Udine studied them, as an artist, by endeavouring to produce similar work with his own hands. Robert Adam, as a draughtsman, copied them on paper, as did probably the Frenchmen through whom France adopted the style. It was undoubtedly elegant and the effect refined; and, since the method of reproduction was mechanical, it lent itself to extensive use.

Much good plaster-work has been done in the last half of the XIXth century—always in the form of attempts, sometimes very successful, to reproduce a past style, and by casting. "Fibrous plaster," introduced since 1861, is a valuable innovation, and presents immense advantages. It does away with the danger of enormous overhead weight, and requires so much the less timber structure to carry it; it can be executed quickly, and it dries quickly.

The facility of plaster-work is at once its recommendation and its danger. It is, perhaps, well to be sometimes reminded that the simplest materials have not been scorned by the greatest men, and that the finished result of any art pleases not only by the talent bestowed on it, but by the fitness of the limitations which the artist has imposed on himself.

The illustrations to Mr. Crace's paper included numerous lantern views, photographs, and specimens of plaster decoration.

At the conclusion of his paper Mr. Crace drew attention to some specimens of plaster work, including an actual piece of the ceiling of the hospital at Kilmainham, showing the sticks which support the elaborate modelling of fruit, flowers, etc.

The Chairman said they had listened to a most interesting paper, both analytical and historical, and their thanks were due to Mr. Crace for the trouble and time he had spent on it.

Mr. R. Phené Spiers said he was glad to have the opportunity of expressing their thanks to Mr. Crace for being willing to prepare a paper on the subject, although it had been treated in that room before both by the Institute and the Association. Mr. Crace had brought to their knowledge new facts, and had given a general historical survey of the subject, which was of great value. He observed also that Mr. Crace had taken the opportunity to refer to mistakes often made in modern work, in which defects were imitated and were looked upon as beauties. He was glad that Mr. Crace had referred to this, because in one or two papers which had been read there that had been emphasised as being rather an important thing to arrive at. Mr. Crace might perhaps have claimed for plaster-work more than even he had done when he referred to the walls of many of the earlier buildings having been coated with stucco. In all probability those crude brick walls would not have lasted all these years had they not been so covered. It was stucco which had aided their preservation to the present day; and they found now in the ruins of Mesopotamia, which dated from 3,000 to 3,500 B.C., walls covered with stucco which owed their preservation to that. Mr. Crace had referred to the exceedingly interesting lecture which Dr. Evans gave there upon Knossos, which carried them back to a period of something like 1,800 years B.C., and he had shown them several heads—one a calf's or bull's head—and also a figure of extraordinary pure modelling and of a kind

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which they had no conception of. There were also a large number of decorative details which were employed in the palace, and this stucco work was in fact the chief means of decorating the interior of the palace. All the capitals, likewise, were moulded. Amongst the most interesting examples which had been shown them that night were those from Rome, and the series of scenes found in the Baths of Titus and in various temples were of most extraordinary beauty. A book had lately been published, and, in going through it, he recognised one or two scenes which he had sketched in his early days and had forgotten for the moment where they came from. Looking at these sketches and at these photographs it occurred to him that one of the great beauties of the work found in the Roman temples, and which had scarcely been recognised, was that they were infinitely more beautiful when on a curved surface; Adam copied all the ceilings he came across in Rome, but the drawings were always reproduced upon a flat ceiling, and, that being so, it seemed to him that they never had the same effect as on the ceilings in Rome. There was always a tendency in all ceilings to "slack," and he could not help feeling how much finer it would have been if in these English ceilings there had been a curve in. The work in Rome seemed more applicable to a curved surface than a flat surface, and he did not know why that should not be adopted. There was no difficulty in doing it, and he was certain that the decoration which was known as Adam's, would look infinitely better if there was a curve. He had on one or two occasions been able to do it, and the decoration at once lent itself to that form. The very beautiful frieze of Mohammedan decoration which had been shown, Mr. Crace had pointed out was repetition casting, and there was a curious instance of this in that the most successful court in the Crystal Palace was that done by Owen Jones. It was the closest resemblance which had ever been made of the work at the Alhambra. It might be interesting to Mr. Crace, as he had shown them a photograph of the famous work in the dome of San Eustorgio at Milan by Michelozzi, to know that there was a small model of it in South Kensington. It was deemed so beautiful that they had a small model made, and one could see the effect of the beautiful figures. He felt that the decorations looked better if seen from below than as they had seen them that night from above. They were meant to be seen from the floor, and he thought they were more beautiful seen in that direction. There had lately been discovered amongst the Wallace collection a very fine bronze, which had been hidden behind a picture, and this had now been cleaned and a photograph of it published in the *Burlington Magazine*. It was a bronze probably of the XVIth century, and they saw precisely the same sort of figures as those which Michelozzi employed. There was a very fine ceiling at the Dolphin Hotel, Southampton, which was one of the most beautiful he knew, and it was well worth going to the hotel to see. They had, of course, a great affection for Chambers and his work, and there were some magnificent ceilings by him in Somerset House. He was anxious to see the rooms occupied by the Royal Academy from 1780 to 1838, and he got permission to go through the rooms, and he found to his delight that these ceilings were almost intact. They were extremely interesting, because they were decorated by many members of the Academy, and they were all set out and designed by Chambers. Mr. Crace had had to go to a very large number of countries to get his views, and they had had that night a *résumé* of the history of plaster-work—had been able to see the value of plaster in ancient times and the extreme advantages it suggested for future use. Of late its use had been brought into account again, and the Art Workers' Guild had had one or two demonstrations, where artists had come down and had actually done the modelling before them. He thought that kind of work should be encouraged, and he trusted that Mr. Crace's paper would have the effect of drawing the attention of the public to it, so that it might be more employed in the future.

Mr. G. H. Fellowes Prynne, in seconding the motion, said that those who had listened to papers which Mr. Crace had read before the Institute and before the Association knew that his heart was in his work, and that whatever he took up he took up with thoroughness. The subject that night was intensely interesting in every way. They who lived in England must be excused for thinking that they could not generally advocate this plaster or stucco work externally. Certainly the examples they had before them in this country, except those of two or three centuries ago, were not satisfactory for external work. When they thought of stucco palaces and houses of the Victorian Era they looked upon them rather in the way of examples not to be imitated, and that was not to be wondered at. Surely it was not a material for external treatment in that country, with their very variable and extraordinarily damp climate. Over and over again they found that cement prepared in the best possible way would flake off from the effects of the weather, and for that reason he supposed it had not been studied as an exterior material which could be used ornamentally with a great amount of success in this country. Of course, it was impossible to read of the past without being impressed with the way that it was used in the earliest days. In fact, in the examples brought before them that night they found the very models from which Adam might have worked out his designs. They saw work represented to be of the IInd century with a beauty of design and grace and freedom which even Adam found it difficult to get. That was the wonderful part of their work—when they looked backwards the examples were almost overwhelming, and one felt how very much behind they were in many ways to those who had long gone before them. The examples put on the screen gave them such excellent ideas of what was the right treatment of plaster for internal decoration that they must all feel that the paper was of intense value. It brought before them again the really right treatment of plaster-work. It reminded them of that later Renaissance period they had passed through, but when one saw the ceilings overburdened with hanging fruit and flowers one felt that really it was not the right treatment somehow. It was beautiful in itself in some ways, but it was not the design one would choose for plaster-work. There, again they felt that the earlier men were before them; that these men seemed to grasp the value and limits of the material they had to deal with. In the Alhambra they seemed to have grasped the very elements of their material in getting their different surfaces. In such examples they had the right if not to copy design, at least to copy treatment of the material they had to deal with. They got to another interesting matter when dealing with fibrous plaster. There they were in advance, to a great extent, to those who had gone before, for surely in the use of fibrous plaster the limitations were very wide indeed. In that material they were able to bring out in a very light way some of the most beautiful effects, for they were able to get the most perfect modelling on a very light surface. What he meant was that the heavy figures they saw in the last century must to a degree pull down the ceiling, but with fibrous plaster the work was so light that there was no danger of the structural work being overburdened. In low relief work there surely must be a very large field. Mr. Moira he believed it was who had put up some panels of decoration in the Trocadera, and they really had an immense suggestiveness about them. For ornamentation of that character with figures, and with colours washed over and not overdecorated, he believed there was a large opening.

Mr. W. Aumonier, in supporting the vote of thanks, said he did not know that he had ever listened to a more interesting paper, and they had had wonderful illustrations of some of the old work. He, with a party of friends, some time ago saw the work which had been referred to at Rome, and it certainly struck him as being some of the most beautiful work he had ever seen. They looked very carefully at it to find out how it was done, but he did not think they came to any conclusion on that. The wonderful way in which it was modelled, apparently nearly all with steel tools, struck him as being very extraordinary. Mr. Grace had referred to work done as being none the better for being what they called defective, but what made the beauty of the Elizabethan ceilings was that it was all in harmony. He did not say that they wanted to save the defects of a fault, but to have a thing all hand worked was a thousand times better than if the mouldings had been worked by mechanical means and the ornaments had been modelled by hand.

The motion having been heartily agreed to,

Mr. Crace briefly replied, and thanked the mover and seconder for their remarks. With regard to the value of curved surfaces, he agreed to some extent with what Mr. Spiers had said. The light and shade took away the hardness of edge and gave something of the charming variable light of a landscape. At the same time do not let them run away with the idea that artistic merit was to be got by placing such work in particular positions or in particular circumstances. The Adam ornamentation, excellent and effective as it was, could not be spoken of in the same breath as the beautiful work he had shown from Rome. The one was a mere mechanical reproduction from the model and the other had from end to end the touch of the artist's hand. Mr. Fellowes Prynne had spoken of stucco and cement as not being suitable for exterior use in this country. He did not know that he was prepared to advocate it, and all that he had tried to point out was that lately the question had been raised whether the Palace of Nonsuch was decorated with plaster panels, and it was said that no one would have been so foolish as to do such a thing. As a matter of fact many people did do it, and there was work of the kind remaining now. He would like to mention that the models which were in the room included one or two bits from the Alhambra. One was lent him by Mr. Millar, who, he was very grieved to hear, died a few days ago. The other was lent to him by the Board of Education at South Kensington, and it exemplified in a very admirable way the point he urged in his paper of the value of different levels of surface where they wanted to produce richness without difficult modelling. He had to thank Messrs. Jackson for lending him some of the specimens in the room. One panel was from the frieze at Stanstead, which escaped destruction in the fire. He was also indebted to Mr. Batsford, to the Architectural Association Camera Club, and to South Kensington for photographs and slides he had shown, and to the Secretary of the New River Company for allowing him to take photographs of their very charming ceiling.

The Chairman announced that the next meeting would be held on March 28, when Mr. Stanley Peach would read a paper on "Electric Generating Stations."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION: SCHOOLS.

In our last issue we gave the first part of a paper by Mr. J. W. Simpson read before the last fortnightly meeting of the Architectural Association. The following is the conclusion of the paper and some notes of the discussion which followed:—

Adjuncts to Scholastic Teaching.—I have referred to the secondary school as necessarily costly. It must not be understood by this that I refer to greater elaboration of finish or detail; it is in additional accommodation, owing to the greater subdivision of classes and the increased number of subjects to be provided for, that cost will be incurred. Also, there will be many adjuncts to mere scholastic teaching, each demanding expenditure. To take a few of the more obvious by way of illustration. I can conceive of no school going beyond mere elementary teaching, without a museum. In one of those six volumes of the "New Review," issued under the dictatorship of the lamented William Ernest Henley, "written," as was said, "by a select few, and read by a select fewer," you may find a most fascinating symposium contributed by the High Master of St. Paul's Schools, Dr. Gow the present head of Westminster, and Dr. Wright of Mill Hill on the subject of public schools. The latter says, "In many schools there are really good museums, largely filled by the boys themselves. The departments of botany, zoology, and geology will be each under the management of one boy, and in the winter terms lectures are prepared and given—in many cases before an audience with many strangers present—by the boys themselves. The Photographic Society, also, is generally a vigorous institution, arranging competitions and exhibitions of work, and giving lectures on the various methods of fixing, toning, and printing. These societies, together with the carpenter's shop and the chemical laboratory, where there is always a band of enthusiasts, afford plenty of occupation for the scientific spirit, while the literary clubs are equally numerous. Many schools have a debating club meeting once a fortnight, a dramatic club, whose members both read and act plays; a literary club, and a reading club to manage the affairs of the library and reading room."

Mr. H. T. Wells, writing to much the same effect, says, "It should be possible to provide

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a certain definite number of hours weekly in which the student should be required merely to show that he was doing something of a developmental kind; he would have his choice between the library, . . . in which he might either read or write, or the music master, the debating society, the museum, the art studio, the dramatic society, or any concern of the kind that the authorities had satisfactory reason for supposing to be alive and efficient."

Such a museum might well be combined with the library, one end of the room being furnished with a table for magazines and miscellaneous literature. Writing facilities should certainly be provided, and nooks contrived in the window openings with small reading tables. Then, again, there is the gymnasium, not the mere swing and bars of the elementary school, but a fully-fitted room with apparatus for physical development. A small stage at one end will be found both useful for supervising general work, and for taking special lessons. It will also be hailed with rapture by the dramatic society, that most effective of all classes for teaching elocution.

I would urge in addition some more satisfactory arrangement than a merely covered play-shed for use in bad weather. This may suffice for a day school, but for a boarding school, at any rate, a plainly-finished room is wanted, where high spirits may be allowed their natural effervescence. A simple method would be to leave piers only in the front and back walls of a portion of the building, filling in the openings with sliding partitions glazed with wire glass. These would stand open in fair weather, while the weather-side partitions would be closed in case of driving rain or snow. One side should be arranged to open towards the play-ground.

The hall is, above all things, important in the secondary school. The teaching is necessarily much subdivided, and classes will be small, probably reduced to some ten or twelve as events develop, and the hall will be to the scholars the symbol of the school as a united body and not as a class of instruction. And it should not be merely a wide corridor for the class rooms to open from, but a spacious apartment in which school tradition may find a congenial lodging, where naked utility shall be clothed upon with beauty of proportion, and large ideas prevail. It should be adapted for all sorts of school functions—lectures, examinations, dances, singing, concerts, and every possible form of common interest which will bring the school together and make the scholars realise themselves a part of its life.

Exit in Case of Fire.—Without attempting even to catalogue the list of requirements for our new higher education schools, there is one matter which I think deserves more attention than, in spite of terrible warnings, it has at present received. That is, the question of exit from school buildings in case of fire. What is the best form for the staircases, and what their best disposition? How would you deal with dormitories, cubicles, or single bedrooms as regards means of escape and prevention of panic? I hope we may have a paper later on on this subject, for it is one of very real interest and importance.

Economy in School Building.—To revert for a moment to the subject of economy in school building. It is perfectly evident that local authorities, however desirous they may be of repressing expenditure, will not be able, if their schools are to be kept abreast of educational advance, to reduce the accommodation at present provided. Rather will they find themselves compelled to increase it. This question of economy is to my mind a very serious one in view of the uneasiness prevailing as to municipal expenditure, and anything we as architects can do to assist the authorities to cut down expenses without impairing efficiency it is our bounden duty to attempt. We are too often, I hope always unjustly, accused of extravagance; generally because of some trifling matter of sculpture or ornament which has caught the eye of the objector. We have all known cases where the expenditure of a few pounds on a morsel of decoration which gave interest and artistic value to the whole composition, has excited more adverse comment and reproach than if the building had been raised 3 ft. all round. Now, it is not in such directions that saving in any well-designed building may be looked for. You shall scrape everything out of the work which renders it pleasant to look upon, and save but a trifle. True economy must be sought in the reduction of cubic content, and I would suggest that a narrow study be made of the heights necessary for your rooms. At present it is quite commonly directed by the school authority that the class rooms shall be 14 ft. or 15 ft. high. This is quite unnecessary, if a proper change of air be provided for by mechanical means. Once you have settled on the minimum height of window which will properly light your further desks—and with the tendency to smaller classes this will correspondingly diminish—you have found the height of your room. Instead of 14 ft. or 15 ft., 12 ft. 11 ft. or 10 ft. may suffice. Consider a moment what this means—from a two-story building of 30 ft. you will have subtracted perhaps 5 ft. or 6 ft. of height, say 15 to 20 per cent. over the whole building. For the reduced height means not only the twenty odd courses of one and a half brick or two brick wall, but lighter girdering, lower and cheaper stairs, better inter communication, and, not least, longer and lower lines in your composition. Schools as now built are very apt to run into square, or even vertical, and unrestful lines in design.

To obtain true economy, two things are wanted. First—the rules of the controlling department must be elastic and interpreted with a liberal intelligence, to the encouraging of original thought on the part of the designers; second—local by-laws must not be permitted to override designs approved by the State Department. I might add a third want, but you will consider it superfluous, there are so many—a good architect.

Requirements in School Buildings.—I notice that Sir John Gorst, in his recent address to the Association of Technical Institutions, expressed the opinion that there was nothing which tended more to cause confusion in administration or to obstruct education than the attempt which has been made to divide education into three water-tight compartments, labelled elementary education, secondary education, and technical education, and to keep those compartments as far apart from one another as it was possible. He went on, it is reported, to declare that there were millions of young people in this country upon whom enormous sums had been spent in elementary education, and upon whom that money had been absolutely thrown away. His view, as I understand it, is that technical instruction should be introduced into both elementary and secondary schools as part of the regular curriculum.

Sir John Gorst is an educational authority whose opinions are worth having, and, looking to the fact that there has been a waste in technical education corresponding at least to that he speaks of in elementary matters, it may well be that some such combination as he indicates awaits us in the near future. If so, our type of plan will undergo a conforming change.

Now that both elementary and secondary education are under one and the same authority, there may prove to be no reason for their future conduct in entirely distinct buildings as heretofore. Great economy might be effected by the complete scholastic course being followed in the same establishment. Many technical and other departments of the school might be constructed for joint use. It would certainly do no harm to the younger children to have constantly before them the immediate results of the studies to which they themselves are bent; and that common centre of school life—the hall—to which I have already referred, would become doubly important as the assembly-place for the whole school.

I mention this as indicating how absolutely necessary it is for us architects to acquaint ourselves with the objects and methods of those responsible for education, if we are to appreciate their varying requirements and embody them in fitting buildings. He is but a poor architect who must have all his employer's ideas formulated before he attempts to design his building. The true artist will put himself in a position by previous study of his subject, to appreciate and aid by his suggestions the development of his client's aims.

New Conditions.—Gentlemen, we are looking upon the dawn of a new era in the education of our country. Bearing in mind that many of my hearers are yet upon the threshold of, as I trust, a prosperous and successful career, you will perhaps pardon me for having spoken to you less of actual school buildings than of the principles which underlie them. For it is the very root matter of good design that it shall arise from the comparative study of what has preceded it. Whether your knowledge of your subject be thorough or whether it be superficial, it shall nevertheless influence your work, in the former case to honour, in the latter to dishonour. It is for us architects then, to prepare ourselves at this dawn of a new day, lest that hoped for, but most searching, morning breeze called responsibility catch us unready.

I trust that to your hands may be entrusted many of the buildings to be erected under the new Act. And this, from no mere desire to see you with work to do, though there is nothing more agreeable to architects than to see work entrusted to their competent brethren. I was lately shown a table of statistics drawn by some ingenious doctor, an Italian, I think, which professed to show the relative degrees of jealousy existing in various occupations. According to this authority we were quite at the foot of the list, jealousy being practically non-existent among architects. I trust, and believe, that this is so, and that it may always remain so.

But I would offer a better, and more largely founded, reason for wishing you this work than the desire for your personal welfare. It is to you, the young men, that we look for quick appreciation of new conditions—it is you who carry our hopes for fresh and new renderings of the old facts under those new conditions. Moreover, you are not yet smirched with officialism. So certainly as ever an architect becomes an official, so certainly will he lose his keen sense of his art and rest, as far as maybe, from inventing. There have been many able official architects, and they will, I think, admit to you, if you take them aside, that their life is a weary round of routine and committee meetings, insomuch that design is choked within them, and they repeat contentedly convenient fragments of the past.

Plan and Elevation.—I have spoken much on the plan and its foundation, and, you will say, nothing of the elevation. Do not think that I esteem the one as of more or less importance than the other. As the plan develops from the conditions, so the elevation from the plan. Moreover, I am not one to admit that there is more or less art in one than the other. Planning does not reach its end, and you must not rest content with it, when it has disposed of the requirements in commodious fashion. That, certainly, it must do, but much more too. A fine plan is a fine piece of design, and you may no more expect the highest kind of elevation without a plan of equal excellence than you may have a perfect body of flesh upon an imperfect skeleton.

There is plenty of scope for the artist in school planning. That all plans may be entrusted to artists, and that you all may be counted, if not among the school planners, at any rate among the artists, is the best thing I can desire for the good of the Architectural Association.

The following communication on the subject had been received from Mr. P. A. Robson, and it was read by Mr. H. Tanner, jun.

Mr. Robson said there were two vital points which govern all school planning:—(1) The unit, which is the child; (2) the aspect, or north point. The latter (being easily spoken of, he took it first) simply consists in this northern climate of ours in giving each unit as much sun as possible. Every classroom, except those used for art purposes or science, should receive the sun's rays during some part of the day. With regard to the unit, unless it was duly regarded, the planning must be bad, and therefore the design bad. In elementary National schools the five-seated long desk had been rather a favourite, because at times of entertainments the desks were removed into a class room or rooms, and by sliding a partition a good-sized hall was often available ready-seated. And for the same reasons stepped galleries were avoided. In Board schools dual desks reigned supreme; in higher schools single desks with 18-in. gangways were preferred. Hence we should see that to be an economical planner we must study the unit and the seating first. Personally he thought all these systems bad, and that single desks *arranged dually*, but with, say, a 6-in. gap between, would be far better for all purposes. So we should get an 18-in gangway, one 2-ft. desk, a 6-in. space, another 2-ft. desk, and then another gangway, etc. Having settled the seating arrangements, it was well to consider annual maintenance:—(1) Number of teachers and "pupil teachers"; (2) size of classrooms; (3) whether a central hall is required. Owing to its excessive cost

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outweighing the advantages, the central hall had latterly come rather into disfavour, and a compromise had been made by having a central hall corridor—anything from 12 ft. to 20 ft. wide—which answered all purposes. The Board of Education's latest production in the way of rules) was unfortunately law, and, therefore, had to be noticed, or he should prefer not to; but, as a new edition was, he understood, in the printers' hands, he would but comment on one curiosity in the current issue:—Given a school of 150 with a first floor (*i.e.*, say with seventy children upstairs), there must be two staircases 4 ft. wide per flight, or one staircase for every thirty-five children! Let us trust that the new issue might prove a help and not a hindrance to the proper planning of schools. With regard to Mr. Simpson's remarks about connecting latrines with the school buildings by covered ways, this was surely hardly necessary, and also wasteful of playground space. Moreover, it hardened children to be about in the open air, and had a tendency to decrease consumption, which arises not from hereditary disease but from unsuitable food and want of fresh air. We should be heating the corridor to the latrines next! Also, was it wise to render the school buildings hopelessly at variance with the rough home-life of the average child? In most towns we saw them, after hours in any weather, without coats playing in the streets. It seemed to him that schools must gradually improve as the homes improved, always keeping a little ahead and being an education in themselves, but not an unattainable ideal, as some schools were now, making the child discontented with his home-life. "And, remember, if you sacrifice the proper home-life, you sap the very inmost vitality of England. Do not, therefore, make your schools ridiculously luxurious; rather give them such a thing as a small swimming-bath for a district than cover the ways to the latrines in all the schools in that district. Now a word or two on design. By far the majority of schools all over England have bad elevations. This is not as it should be, and it is for you to remedy. The President of the R.I.B.A. has courageously asked us not to neglect imaginative literature. I venture to suggest that music is even better still as a stimulator to the imaginative faculty. To use the words of a great critic, 'Music, then, not poetry, as is so often supposed, is the true type or measure of consummate art. Therefore, although each art has its incommunicable element, its untranslatable order of impressions, its unique mode of reaching the imaginative reason, yet the arts may be represented as continually struggling after the law or principle of music, to a condition which music alone completely realises; and one of the chief functions of æsthetic criticism, dealing with the concrete productions of art, new or old, is to estimate the degree in which each of these products approaches in this sense to musical law." Let each of us, therefore, try to make our plans right, and it will then be the easier to make our designs "frozen music."

Mr. John Slater, in proposing a vote of thanks, said that he was lost in admiration of Mr. Simpson's courage when he heard that that gentleman was going to read a paper on so large a subject as schools. Mr. Simpson had taken a line which some of them did not expect, but he had given an extensive and interesting *résumé* of the development of schools. He had listened to the paper with a good deal of pleasure, because he could remember some of these National and British schools which had been referred to; in fact, one of his earliest independent jobs was to add a classroom to an old British school, and in another case to make a covered way for the children to the latrines. It was interesting to notice the divergence in Prussia in comparison with our English official ideas as to the arrangement of schools. No one could avoid referring to the Prussian methods in an educational discussion, for the Prussian system was about the best which existed anywhere. Mr. Simpson had quoted Charles Lamb as to what occurred at Christ's Hospital; he (the speaker) had no doubt that some of the members noticed a few years ago a paper or brochure on Eton in the early part of the last century, and if they read that account, and realised what these high-class boarding-schools were in those days, they would wonder that any student who attended them came out alive. The last century witnessed an enormous improvement in the Boarding Schools of the country, but in Prussia, though there were, of course, excellent Boarding Schools, yet they all had a strictly classical curriculum, and there was not the slightest doubt that the reaction against such a curriculum occurred in Prussia very much earlier than it did with us. For any boy with classical tastes and with a bent for literature a classical curriculum would do a great deal of good, and after going through the course he would turn out a cultured man; but there was no doubt that a large number of students wasted their time and got no good from the classical training which used to be the sole one, and they appreciated the fact abroad earlier than we did that the range of learning necessary to make an educated man varied with different times and circumstances, and they very early adopted a system much more like what we are adopting now with regard to their schools. To take one instance—only about two months ago our Board of Education organised a conference, at which both Mr. Simpson and himself were invited to be present, to discuss the question of such institutions as the Royal Institute of British Architects, the Surveyors' Institution, and the medical institutions, recognising and accepting the leaving certificate from some secondary schools as qualifying the man who was studying for architecture, surveying, or medicine, and exempting him from the entrance examinations of those bodies. It seemed incredible that in England (it existed in Scotland) there was no system of leaving certicate at all, but the Prussians as long ago as 1798 instituted the leaving certificate. That showed how carefully the pioneers of education went into the question long ago. Pestalozzi, as everyone knew, was the organiser of elementary education abroad, and there were other names, such as von Humbolt and Schleiermacher, who did the same thing for secondary education. Mr. Simpson had justly said that this Act of 1902, dealing with secondary education, would create a revolution in this country; but to show how slowly we work in this country it might be interesting to state that as long ago as 1876 Matthew Arnold, who was a great educationalist, used these words:—"The intervention of the State becomes especially necessary in superior instruction, because here the body of public opinion, educated enough to discern what it wants, gets smaller than ever." It was curious that, although such words could be written by one of our best educationalists so long ago, we should have to wait so long to get the change he advocated. As to constructional details, he agreed with Mr. Simpson that it was necessary not to make any formula a fetish; but as to left-hand lighting, he could not agree with the lecturer. He believed that the left-hand system was the best for the students, and that there was not much in Mr. Simpson's criticisms on that head. But he agreed with Mr. Simpson as to the height of class-rooms and school-rooms. There was too great a tendency to make class-rooms more lofty than there was any necessity for. No matter how lofty a class-room might be made, if it was crowded with children, some mechanical means must be adopted for moving the air, for the greater height would not prevent the air becoming stagnant. He had been glad to hear the remarks about naked utility, for he was sure that in a school it was a great thing to have the main hall beautiful in order to educate the children. Although he did not like to differ from such an authority as Mr. Robson, he could not help wondering, when he heard Mr. Robson's remarks, whether Mr. Robson knew that in the case of a good many children they had no home at all. How could one hope to educate those children and beautify their lives if the school-rooms were kept in a state of naked utility?

Mr. J. Osborne Smith, in seconding the vote of thanks, said the paper was rather like one they might expect at the opening of a congress on schools; it was full of suggestions, none of which, however, were fully thought out or dealt with in a critical way. But he thought this was the proper time for such a paper, for we were in a state of transition about everything in regard to schools, and this was just the sort of paper to discuss amongst themselves. He believed that the authorities were beginning to see that it was unwise to work on too hard and fast lines, and that in the future, so far as the Board of Education was concerned, the rules would be more elastic than hitherto, very much to the benefit of schools and those who had to work in them. Much in the future of school planning depended on the methods adopted in the teaching, and these methods, too, were in a state of transition. Mr. Slater's illustration as to higher schools and the classical curriculum applied also to the lower schools. There were a great many children taught in the lower grade schools to whom the semi-literary form of education they received was no good at all, and the time so taken up would be much better employed in teaching those children technical subjects in technical schools. In time order would come out of chaos, and architects' plans of schools would be altered accordingly. There was one thing, however, which he hoped would not be altered. We have been gradually getting free of those dull, dreary, not to say unhealthy, schools which Mr. Simpson had referred to in his retrospect, but Mr. Simpson seemed to suggest that the lower-grade classes could be made larger. He would be sorry to see a step of that kind taken. Let them make their classes smaller and teach the children more thoroughly. That was the present tendency, and he hoped it would continue. He was glad we were likely to have a very sympathetic head of the Architects' Department of the Board of Education. He was sure that Mr. Clay would study every matter on its merits, and would look at it from a sound and healthy point of view, not from the point of view of "official red-tapeism." It was a very important thing to get cheerful and healthy schools. There was a tendency now to make the windows much too large. He had just built an addition to a school under the new Act, and when he went in it the other day he was startled at the amount of light. That meant so much more chilling surface, which was very objectionable in the case of children who sat near the windows. There was bound to be a chilling down-draught in such weather as we have been having. We should get an aspect for our schools which gave the largest amount of sun for the class-rooms. He remembered the time when they were told a north-east light was the best for class-rooms, but in modern plans the point was dealt with very satisfactorily. On the cold side was the staircase and the cookery-rooms perhaps, but the class-rooms were placed where they got the sun. As to the plan by the late Professor Roger Smith, to which such pleasing references had been made in Mr. Clay's book and by others, it was the right plan for secondary schools at the present day, and many of the best schools were based upon it, although at first it was put on one side. The corridor plan for some form of teaching answered its purpose when cost was a consideration and they could not afford a hall, but he preferred a hall, though not as he had seen it arranged, with class-rooms surrounding it, especially on the upper floors, so that some of the rooms had no direct sunlight. As to the position of pupils in relation to the windows, that reminded him of what he once saw in a class-room of a secondary school, *i.e.*, the pupils sitting, as a regular thing, with their backs to the master. He did not believe that was at all a usual thing. He was bound to agree with Mr. Slater as to left-hand lighting, although in a number of schools there were rooms that did not need the left-hand light; but in ordinary class-rooms he had never been able to convince himself that it was right to dispense with left-hand light, although he knew it was advocated. He agreed with Mr. Simpson as to the value of a properly regulated system of education, and that in time schools would be provided with the luxuries he mentioned, *i.e.*, museums, workshops, gymnasiums, etc. Literary instruction for some children was a mistake; it was far better to turn those children into the chemical, science, or technical rooms; the children were delighted and were far better educated as a result. In time we should have our schools furnished with libraries, workshops, cutting-out rooms, studios for drawing and modelling, rooms for music, and all such things. Where the money would come from he did not know, but it would come.

Mr. Millard said the paper they had heard was a useful one apart altogether from the points as to school planning. The doctrine of the growth of plan from the use to which a building is devoted, applied to more buildings than schools. Mr. Simpson said that no new development would be attained in school design without a thorough knowledge of the conditions on which the problem was based. Each building that an architect had to design meant for him a solution of a problem, and it was essential for the right solution of a problem that it should be quite clearly stated. All the conditions should be present to the architect's mind, so that he could state the problem quite clearly to

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himself and then proceed to solve it; to start with some pre-conceived notion of his own, or somebody else's, and to try to make the conditions work in with this, was to put the cart before the horse. Mr. Simpson had said that repairs could be left to the surveyors rather than to architects. That was a distinction which he did not quite relish. Could not the architect act in the capacity of surveyor in regard to repairs and up-keep of buildings? Would he be much of an architect if not capable of doing so? The building rules of the Board of Education which had hitherto been in existence, and which had to be worked to, professed to tell an architect how to build well, but he was glad to hear that they were being revised, for rules which purported to do that ought to be above question, and ought not to be open to the suspicion of having the trail of the amateur over them—the influence of the high-placed non-expert over-ruling experts. The quotation in the paper from Mr. Wells reminded him of a visit the Association paid to Harrow School last summer and of the Art School there. It was a revelation to him to see how Mr. Hine treated his pupils, *i.e.*, as separate units, and not in the lump. Each man was trained to do his individual best. Was not this a hint for an architectural school? Let them beware of accomplishing all they desired their school to become merely by a set curriculum. Mr. Simpson had kept to principles, and he did not deal with the latest modern work. But, he could not help being reminded of one of Mr. Simpson's own works—a large school on the cliffs between Brighton and Rottingdean, which appealed to him very much. He felt it had been erected by an architect who began at the beginning by modelling his building on the site and uniting it to the site. Mr. Simpson said that young men were needed. It might be so; then they must be young men with old heads if such problems as Mr. Simpson foreshadowed were to be thoroughly grasped and truly solved; the newest and most brilliant ideas would of themselves go a very little way without experience and the capacity to profit by experience, and this could not come in a flash. The architects must be made as well as born. To the making of him there went various ingredients, and in him must be found certain qualities indispensable to success; power to grasp, wisdom to foresee, imagination to initiate, and firmness to decide.

The Chairman, in putting the vote of thanks, said that the paper was an extremely valuable one. In regard to what Mr. Simpson said as to the rules of the Board of Education for regulating the design of schools, and his plea for making them more elastic and administering them with a little more intelligence, he hoped that Mr. Simpson's plea would bear fruit. There was always a tendency in Government departments to gravitate towards hard and fast rules, and he supposed that was because the more hard and fast they were the less intelligence was required in administering them. If you could only arrive at a state of affairs in which every case would be intelligently considered on its own merits without being affected by cast-iron rules, that would be a most desirable state of affairs, and he hoped that that would come to pass. Mr. Simpson's remarks as to economy, and as to the possibility of getting design into our school buildings and making them to some extent beautiful, they must all agree with. What Mr. Simpson said as to the height of rooms appealed to him very much. Much more economy might be effected if the height of buildings was reduced. Some existing rules as to height and other details of the kind were ridiculous. It was absurd to have a class-room of moderate size 15 ft. high. It was no use to any one; the saving which would be effected by those ridiculous rules being altered would compensate ten times over for any little elaboration one might introduce in the building. What, he supposed, Mr. Simpson meant in his reference to larger classes was that the more elementary the teaching the larger the class might be, and that, if such classes could be increased, it might be possible to decrease correspondingly the size of the rooms where the teaching was more advanced without any increase in cost.

The vote of thanks having been heartily agreed to,

Mr. Simpson, in the course of a brief reply, said that in bringing such a paper before them his idea was this: it was unnecessary to select plans from different buildings—little tips as to the best way to do this and that—to put before a purely technical body. That was done for them in the building papers and in the text-books. What was important, and especially important for a body of young men, was that they should be induced, if possible, to think out the principles which govern their design, and it was more to that side of the question that he had addressed himself than to the finished and worked-out problem. As to what had been said about left-hand light, there seemed to be some misapprehension as to his remarks. He had no intention of deprecating left-hand lighting, for he was fully aware of its great importance. The objection he ventured to raise was as to its being made into a kind of fetish. In modern competitions for schools he would be a brave man who ventured to show a class-room which was not left-hand lighted, but there were many cases in infant schools where left-hand lighting was not necessary. He cordially supported what Mr. Osborne Smith had said as to the importance of sunny class-rooms.

The Chairman announced that the next meeting will be held on April 8, when Mr. W. Gilbert will read a paper on "Craftsmanship."

The meeting then terminated.

OLD HOUSES, CHURCH-STREET, WINDSOR.

THIS illustration of some old houses at Windsor, recently demolished, is from an etching by Mr. J. Percy Wadham, whose drawing of the old well at Villeneuve-les-Avignon forms one of the illustration plates in this number.

The house with the projecting bay used to be called "Nell Gwynne's house," but we do not know that there was anything beyond a vague tradition to connect it with that rather unfortunate person. The houses stood on the Castle side of the street, and it is said that they were formerly occupied by ladies and gentlemen in attendance on the Court, and a subterranean passage connected them with the Castle; this was closed about the middle of last century.

Old Houses, Church Street, Windsor. From an etching by Mr. Percy Wadham.

A year or two back the local authorities expressed their intention to pull down these old houses in order to erect a drill hall. A strong protest was made at the time, but to no purpose; the houses were demolished, though only to leave an empty space, as the drill hall scheme fell through.

THE ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of the subscribers and donors of the Architects' Benevolent Society was held at No. 9, Conduit-street, Regent-street, W., on Thursday evening last week, Mr. Aston Webb, R.A., President, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. Percivall Currey, Hon. Secretary, read the fifty-third annual report, which stated that the work of the Society has been well maintained in spite of many adverse circumstances. The Society has had during the past year a small increase in its subscriptions, but it has also had a corresponding drain upon its resources, so that at the end of the year the Treasurer has only a small balance in hand. The claims that have been made upon the Society during the past year have been very urgent, and in some cases from architects who were formerly in good practice, but who, through sickness or other causes, have found themselves unable to continue their work.

"The Council have to regret the loss through death of the following subscribers:—Mr. J. F. Wadmore, Mr. Francis Edwards, Mr. Herbert Ford, Mr. Henry Saxon Snell, and Professor T. Roger Smith. The total amount of subscriptions received during the past year is 554*l.* 16s., and the pensions and grants amounted to 830*l.* 2s. 6d. The following gentlemen retire by rotation from the Council:—Mr. Sydney Smirke, Mr. H. L. Florence, Mr. Graham C. Awdry, Mr. J. T. Christopher, and Mr. F. T. Baggallay. To fill the vacancies caused by these retirements the Council desire to nominate Mr. T. E. Collcutt, Mr. Rowland Plumbe, Mr. G. T. Hine, Mr. Wm. Grellier, and Mr. Ambrose Poynter. The balance-sheet and income account for the year ended December 31, 1903, audited by Mr. Henry A. Hunt and Mr. Edmund Buckle, are submitted. The sincere thanks of the Society are due to the Council of the R.I.B.A. for the use of their rooms, and Mr. Locke and the other officials have rendered material assistance which is cordially appreciated. Donations have been received from the following gentlemen:—Mr. Graham C. Awdry, 25*l.* 10s.; Mr. F. T. Baggallay, 10*l.* 10s.; Mr. John T. Christopher, 5*l.* 5s.; Mr. Percivall Currey, 5*l.* 5s.; Mr. Ambrose Poynter, 5*l.*; the Tylers and Bricklayers' Co., 5*l.* 5s.; Mr. H. Walter Lonsdale, 5*l.* 5s.; Nottingham Architectural Society, 5*l.* 5s.; Mr. Aston Webb, R.A., 5*l.*; Mr. F. W. Tasker, 5*l.* 5s.; Mr. H. Cheston, 5*l.* 5s.; and Mr. David Morgan, 5*l.* 5s., &c."

The Chairman, in moving the adoption of the report and balance-sheet, said the cost of working the Society hardly came to 12 per cent. of the receipts, which, for the amount that was subscribed, was very small indeed, and thanks were due to those who managed the affairs of the Society so economically. The members of the Institute number 1,830, and out of that number he was sorry to say there were only 350 who subscribed to the funds of the Society, while the architects practising in the country numbered between four and five thousand. This Society was not an Institute matter solely; it was a benevolent society for all architects, and it helped all architects who were in need, independently of their opinions or of any society they might belong to. He thought it would be agreed by all architects that there were two matters in connexion with the profession in which they all might join, whatever their opinions and feelings. One was in the education of the young, and the other in assisting the aged, the infirm, and the unfortunate. The stock-in-trade of an architect was a small one—his brain to think with and his hand to work with, and if one or the other went wrong he was at once plunged into difficulties and embarrassment. The subscriptions had increased during the year by something like 50*l.*, which was a very good and encouraging fact; but, on the other hand, the donations were the smallest for many years past, *i.e.*, 96*l.* 12s. He understood that there was a legacy of 100*l.* thoughtfully left by the late Mr. Saxon Snell, but so far they had had no official intimation of it. There had been fifty applicants relieved during the year, and they had haled from Dublin to South Africa, so that all shared in the benefits of the Society, and for that reason he thought they had a right in asking them to support the Society. Sixty per cent. of the

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applicants came from the provinces, but the supporters of the Society were nearly all from London, and even in London there were many well-known names not on the list of subscribers. He thought they should all help in the work the Society was doing, so that more might be done to help those who were unfortunate and in distress. He thought it would be well if architects generally would take less notice of begging letters and appeals, which were extremely painful to deal with, and instead were to increase their subscriptions or commence to subscribe to the funds of the Society, where every case was looked into carefully and assisted according to its merits.

The motion having been agreed to, Mr. H. H. Collins moved a vote of thanks to the retiring members of Council. It ought to be brought home to provincial architects that they should do more to help the Society, seeing how good a work the Society was doing. In a sense he was glad that the balance in hand was only 15*l.*, for that made it an absolute duty on those who had means to help augment that balance.

Mr. A. Style seconded, and the motion was agreed to.

Mr. J. Macvicar Anderson then moved that the following gentlemen be elected as members of Council for the ensuing year, *i.e.*, the President, the President of the R.I.B.A., and Messrs. J. J. Burnet, J. H. Christian, R. St. A. Roumieu, G. Scamell, E. A. Gruning, Edwin T. Hall, Lewis Solomon, Wm. Woodward, H. H. Collins, E. T. Collcutt, G. T. Hine, Wm. Grellier, Rowland Plumbe, and Ambrose Poynter. If the Council, he said, could, during their year of office, induce a larger number of architects to subscribe and take part in the work of the Society, they would be doing a very good work.

Mr. M. Watson seconded, and the motion was agreed to.

Mr. H. L. Florence moved a vote of thanks to Mr. W. Hilton Nash for his services as treasurer, and that he be re-elected in that capacity. He also moved to the same effect in the case of Mr. Percivall Currey, the Hon. Secretary.

Mr. H. Lovegrove seconded. Fifteen pounds was a very small sum for the Treasurer of the Architects' Benevolent Society to hold, and he thought that it ought to be possible to get more architects to take an interest in the Society. Last year he suggested a dinner, but the proposal did not seem to find favour.

The motions were heartily agreed to.

Mr. Nash said that only one-sixth of the members of the Institute helped the Society, and there were only about one-fourteenth of the architects of the country who subscribed. That proportion was too small.

Mr. Currey, in replying, referred to the great assistance they received from Mr. Dirks, the Secretary.

On the motion of Mr. Nash, seconded by Mr. Scamell, a vote of thanks was accorded to the retiring auditors, Messrs. E. Buckle and H. Hunt, and Messrs. Hunt and J. Christopher were elected auditors for the ensuing year.

On the motion of Mr. R. St. A. Roumieu, seconded by Mr. Currey, a vote of thanks was accorded to the Institute for the use of their premises, and on the motion of Mr. J. D. Crace a hearty vote of thanks was passed to the Chairman.

Mr. Webb replied, and the meeting terminated.

CARPENTERS' HALL LECTURES:

ARCHITECTURAL DEVELOPMENT DURING THE XIXTH CENTURY.

THE fourth of the present series of lectures on matters connected with building, arranged by the Carpenters' Company, took place in their Hall on Thursday evening last week, when Professor F. M. Simpson delivered an interesting lecture on "Architectural Development during the XIXth Century." The Rt. Hon. Lord Reay presided.

Professor Simpson said that in the course of the hundred years now under discussion more changes took place than during the previous four centuries. The first thing to determine was, why did architecture during this period proceed on lines so different from those which had prevailed previously? The key to the solution is found in the unsettled state of affairs at the end of the previous century, due to the great French Revolution. Up to that time the secrets of the crafts of architecture, painting, and sculpture had been passed on from father to son for generation after generation, but the French Revolution and the changes it effected destroyed these traditions. But the end of the XVIIIth century was not only an age of revolution; it was also an age of artistic—or perhaps a better word would be archæological—revivals, and revivals not only in architecture, but also in painting and sculpture. The architecture of the XIXth century might be roughly divided into two periods: the first, from 1800 to about 1860, was the age of revivals; the second, from 1860 to the end of the century, was the age of experiments. In the former period there were two revivals, which ran concurrently, *i.e.*, the Greek revival and the Gothic. The architectural world, including both practitioners and patrons, was divided into two hostile camps. All were classical or mediæval; no compromise was possible. The classical revival had commenced some years before the century opened, chiefly owing to the enthusiastic investigations into the principles of Greek art by Stuart and Revett and others, supported by the powerful Dilettante Society. Additional impetus was given to the movement by the importation to England by Lord Elgin in 1816 of the sculpture from frieze and pediment of the Parthenon at Athens.

As to the Gothic revival the lecturer referred to Horace Walpole's villa at Strawberry Hill, in which the spirit of Gothic was absent. The flame of the Gothic movement was fanned by the novels of Sir Walter Scott, and many pretty fancies followed its revival, but the result was that for a time XIXth century buildings were made to masquerade in mediæval garb. This was the state of architecture in the first half of the last century: the romantic and the classical schools were at loggerheads one with the other, and it is difficult for us now to understand with what bitterness the war of the styles was waged. Professor Cockerell was the captain of the classic camp, and Augustus Welby Pugin was leader of the Gothic, and two men more different it would be difficult to imagine. Cockerell was a man of intense refinement, exquisite taste, and considerable knowledge; his manner was polished as his work—a courtly gentleman, he was no match in a war of words for his fiery and outspoken opponent, who, a genius who died at the age of forty, owed much of his versatility and impetuosity to his forebears, who were French. Both men were enthusiasts and both were mistaken. The English of the XIXth century could no more return to mediævalism than it could return to the glories of Greece. Besides Cockerell, the classic camp included Sir John Soane, John Nash, Wilkins, Sir Robert Smirke, and Sir William Tite. One building which belonged to the period and which specially deserved mention as being universally regarded as the most successful of its kind in England, if not in Europe, was St. George's Hall, Liverpool, won by Elmes in competition.

As to the Gothic revival, in the early days of the century Britton commenced the publication of his "Architectural Antiquities" and "Cathedral Antiquities of England," both works having considerable influence. Britton was followed by Rickman in his "Introduction to Gothic Architecture," while there were other writers who expressed the same views. Pugin threw down the gauntlet by comparing the work of the Middle Ages with what he called the pagan method of his own time, and his two main principles were sound ones. The first was that there should be no features about a building which were not necessary for its convenience, construction, and propriety; and the second was that all ornament should consist of enrichment of the essential construction of a building; and he further stated that there were many objects of ordinary use which were rendered ridiculous because the artist, instead of seeking the most convenient form and decorating it perpetrated some extravagance. It was as necessary to preach that now as then. Pugin was not always able to practise what he preached, but that was not his fault. He was not to blame because ornament was cast in plaster, instead of being executed in stone, nor for the shams which mar so many early examples of the revived style. In one little work he had his own way entirely, *i.e.*, in the Roman Catholic Chapel at Ramsgate, which remains a monument of the Gothic feeling which he undoubtedly possessed and of the painstaking care he was always ready to take. A much larger work in which he assisted was the Houses of Parliament, which, as he said, had Tudor details on a classic body, and it must be granted that the building is pretty warmly clad. The Houses of Parliament and St. George's Hall showed clearly the absence of a recognised style of architecture at the commencement of the late Queen's reign; the two works were commenced at exactly the same time and were monuments of two styles.

After 1860 appeared another body of men who designed on somewhat different lines, but before considering them he would refer to the Great Exhibition of 1851. From the illustrated catalogue of the Exhibition it was easy to see how atrocious almost all the exhibited designs in the crafts were, and the Exhibition brought this fact home to the people, and that was the great good it did. The revival of artistic handicraft dated from this period. The Exhibition brought to the front the big manufacturers and middlemen who understood the art of buying and selling and the art of advertising, but who did not appreciate or understand the art of design. The great advance which has recently taken place in industries, and which is one of the most pleasing facts of the present time, is largely due to the fact that artists have once more emancipated themselves. One can now buy direct from the craftsman who designs and makes the wares he sells, and William Morris was probably the first to lead the way in the right direction. Vulgar things, it was true, could still be bought in vulgar shops which, he was sorry to say, were sometimes shops to which the designation "best" was applied. John Ruskin had a good deal to say about the Exhibition, but chiefly in opposition to it. As a writer of beautiful prose, Ruskin would always be held in high esteem by the general public and others, and his writings had had considerable effect on those who appreciate good art, though it was somewhat doubtful if they had had very much effect on those who produce it. Ruskin felt strongly the beauties of Gothic architecture, and he expressed his feelings in beautiful language, though he often overstated his case, showed an intolerance of architectural works of periods other than the Middle Ages, and contradicted himself with a freedom which was bewildering.

As to the architectural work of the second half of the century, there was a marked change. Pugin and his contemporaries had followed as closely as the limitations imposed on them permitted the English Gothic of the XVth century, but in the work now to be considered other forms were developed, and not all of them English. The increasing facilities for foreign travel had brought the Continent within reach of everyone, and foreign idioms crept in. Sir G. Scott got much of his inspiration of English Gothic from the XIIIth and XIVth centuries and took many of his ideas from French work, and other architects followed suit. Most of Scott's churches were of stone; the fine brick churches of London and elsewhere were of a later date and by other men, notably Butterfield, James Brooks, and others. Scott would be chiefly remembered as the central figure of the restoration movement which, started by the Cambridge Camden Society and backed up by the whole army of ecclesiastics, swept over the land in the sixties and seventies. A clean sweep was made of everything that was not Gothic, and the result was that an unrestored church was as difficult to find now as an unspoilt watering-place. Before the craze set in, churches were full of the work of all ages, every stone telling a story, and the history of England was written in and about these old buildings. The restorations of the XIXth century ruthlessly destroyed this history. The problem was no doubt a difficult one; to have allowed these old buildings to fall would have been an act of vandalism, and the wave of Gothic enthusiasm was too strong for half measures. In the case of the cathedrals and large churches, it was difficult to see how the restorationists could have acted otherwise than they did, but some of the parish churches might surely have been preserved without the elaborate schemes of restoration to which they were subjected. The money spent would have been better used in building new churches alongside the old ones and allowing the old buildings to remain as historical monuments, a little judicious attention preventing them from further decay.

From 1875 to the end of the century many churches were erected by Street, Butterfield, Burges, Pearson, Sedding, Mr. Bodley, and others which might fairly compare with the best examples of the Middle Ages. Street's great work, of course, was the Law Courts, in which he tried the impossible. This building, probably more than any other, showed the futility of employing Gothic for public buildings, and it might be termed the last great effort in the style.

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The last quarter of the century was chiefly remarkable for the enormous advance which took place in the designing of private houses. The work of Mr. Norman Shaw and Mr. Philip Webb had an immediate effect on both domestic and street architecture. Before their erection stucco and Welsh slates had been supreme for private houses, but they gave way to red brick and tiles. The new style was promptly christened Queen Anne, and it had its affectations, but the style was a sound one and produced some excellent results, combined with some strange vagaries. The names of some first-rate living architects were not known as well as the names of living painters of even second or third rate rank, for people rarely looked at a picture without asking who painted it, but when they saw a beautiful building they rarely did more than inquire who lived in it or what it was for. Following the Queen Anne movement was a Continental invasion. Architects crossed the Channel and sketched interesting bits which they worked into their designs, and sketch-book architecture became the rage for a short time, but level-headed Englishmen after a while resented the intrusion of these undigested fragments. The chief fault of the Queen Anne movement had been a craving after the picturesque, and this was carried to a still further extreme by the sketch-book men. In time, however, the old adage that true picturesqueness lay in simplicity reasserted itself and buildings became plainer, architects relying more on proportion and less on ornamentation. Carving, where used at all, was not allowed to straggle all over the façade, but was massed in one or two places where it was desired. The sculpture and carving work was entrusted to artists and not to firms, and sculptors and architects worked once more in sympathy A more chastened version of classical architecture than the Queen Anne had now replaced that style, but how long the present movement would continue it was impossible to say. So many changes had taken place, so many phases of art had been attempted in the last century that no one could say how long it would last, but the chances were in its favour, and the style was adaptable. Correctness of detail was not insisted upon as in the case of the Greek or the classic revival: its fetters hung loosely on the designer and did not cripple his individuality. The great difference between work done now and that of a century ago was the variety in the present-day work. Utilitarian buildings one hundred years ago were frankly plain; now, fortunately, architectural expression was required in addition. The large hotels, the schools, private, public, and technical, the municipal buildings, the blocks of city offices, the big flats, etc., all required special planning and individual expression, and it was this that now made an architect's work so complicated and yet so fascinating. It was because of this that failure was so frequent and success so rare. Each separate building had to be planned, designed, originated afresh. From the observation of the various necessities of planning and from the proper expression given to each type would spring sooner or later a recognised architectural style—a style in which architects, sculptors, painters, and craftsmen, would work together in harmony. He said "sooner or later," but he thought he could go further and say that it is now springing up. Without some such uniformity of ideal advance in architecture was impossible. Art was like a State—it could not advance in the midst of civil war; but those who demand a new architectural style in honour of a new century ask for the impossible. There never had been such a thing as a new style; styles had always been evolved out of preceding ones, and the evolution had been so slow that it was impossible to say where one began and the other ended. To have an absolutely new architectural style we should have to have new buildings materials, new methods of construction, new requirements, a new climate, new conditions, and, in fact, a new earth.

Professor Simpson then showed a large number of interesting lantern slides to illustrate his remarks.

The Chairman proposed a hearty vote of thanks to the lecturer, remarking that he had induced the Council of University College to reorganise the scheme of architectural education altogether, and that important reform had been placed in the hands of Professor Simpson.

The vote of thanks was heartily agreed to, as well as a vote of thanks to the Chairman for presiding.

THE ASSOCIATION OF MANAGERS OF SEWAGE DISPOSAL WORKS:

THE SEWAGE PROBLEM.

A MEETING of this Association was held on Saturday afternoon last in the Library of the Sanitary Institute, Margaret-street, W., when Mr. W. D. Scott-Moncrieff delivered a presidential address entitled, "The Year's Progress in the Solution of the Sewage Problem."

The lecturer first quoted from a contemporary a review of sanitary engineering in 1903, after which he remarked that the first impression obtained from this long list of works in progress must be a recognition of the fact that, however Great Britain may be falling behind in other departments, we are still maintaining our position as the pioneers of sanitation. But, although it was flattering that other nations should look to us for light and leading upon all matters connected with public health, it was well known to all practical managers of sewage works that these great undertakings were being carried out from many different standpoints, and that their design was not connected by a common standard or by generally accepted formulæ of any kind. Things were all sixes and sevens, and a great Government department was sheltering itself behind a Royal Commission which had been sitting for about five years without even giving an expression of opinion upon the main issue they were to report upon. Yet it would be difficult to find a reference drawn more concisely than the one with which the Royal Commission had to deal. It was as follows:—

(1) What method or methods of treating and disposing of sewage (including any liquid from any factory or manufacturing process) may properly be adopted, consistently with due regard for the requirements of the existing law, for the protection of the public health, and for the economical and efficient discharge of the duties of local authorities.

(2) If more than one method be adopted, by what rules, in relation to the nature or volume of sewage or the population to be served or other varying circumstances or requirements, should the particular method of treatment and disposal to be adopted be determined; and to make any recommendations which may be deemed desirable with reference to the treatment and disposal of sewage.

This was the reference upon which the Royal Commission had been sitting for five years, and so far as regards the main issue they had gone no further than to say that certain methods, which were described in no detail, might be adopted with certain precautions which were not described at all. If it had never been appointed the hands of the Local Government Board would have been forced long ago. Public opinion would have expressed itself so strongly, and the department would have been so pestered by deputations, that it must either have proclaimed its incompetence on the house tops or have adopted a consecutive and rational policy of some kind. If the Royal Commission had proved competent for the work they had undertaken it would have been different, but as matters stand it might safely be said that the contributions of the Royal Commission towards the practical solution of the sewage problem so far as the public was concerned had been a blank. The four interim reports they had issued might very well have been produced by a departmental committee of the Local Government Board without committing them in any way.

Having referred to the methods of sewage disposal in Glasgow and Birmingham, the author said:—"Now in taking the case of these great cities—one still deliberately adopting a process at great expense which the other has absolutely abandoned, and effecting a great economy in doing so—it is important not to be led into any wrong conclusion. That the question is one of great importance to other communities, and that it amounts not only to a difference in degree but in kind is quite certain. The Corporation of Glasgow and the Birmingham, Tame, and Rea Drainage Board both acted under the advice of their expert, and it is difficult to believe that both of them can be right except under one supposition, namely, that the sewage of the two cities differs so materially that what was good for one did not apply to the other, and that each has been justified in carrying out their own works in their own way. Now this point is the crux of the whole question, and in speaking of the year's progress we may spend our time to some purpose in trying to investigate this contradiction. You will all agree with me that if the existing state of knowledge is so inchoate as to preclude the possibility of arriving at a sound conclusion, then the sooner that progress goes on the lines of more accurate knowledge the better for all concerned. We will presume that the scientific advisers of the Corporation of Glasgow were fully acquainted with the advantages to be obtained from the liquefying action of hydrolysing tanks, but that they believed there were good reasons for not adopting them. It could not be that the Glasgow sewage was not capable of undergoing a putrefactive fermentation, because it is common knowledge that it does, and the only reason that one can think of as pointing to the use of chemical deposition is the old tradition that the organic matter in solution from a hydrolysed sewage is in excess of the capacity of any bacterial filter to deal with. In other words, they are spending money for chemicals upon a supposition which has been entirely disproved in the case of Birmingham. We are thus, I think, forced to the conclusion that the Glasgow scheme, involving a vast sum of money which is being saved at Birmingham, was adopted under advice which has been repudiated with the best results."

This was the sort of thing that was going on all over the country, while the Royal Commission was looking on as though it were an entirely disinterested spectator. It was obvious that all the works referred to, involving a gigantic sum of money collected from the rates, were being carried on in a haphazard way, unguided by any scientific knowledge that was worth the name. The methods now being employed were empirical from start to finish, and the mistakes that were being made, involving as they did an almost incalculable waste of money and efforts, were the result of blank ignorance as to the conditions that were essential in order to obtain economical success. The extraordinary feature of the situation was that no one—no chemist, no engineer, no expert of any kind—had taken the trouble to find out what the necessary conditions really were by any kind of standard that was capable of comparing one sewage with another in terms of the measured condition required to produce any standard of purity in an effluent. If the Corporation were to question their scientific advisers upon these essential points not one of them would be able to give an answer—a really scientific basis of any kind—and this being so one need hardly be astonished at the absence of any progress upon scientific lines. These remarks did not apply in the case of Birmingham, where a successful solution of the problem was being rapidly achieved by simply complying with the conditions which nature absolutely insists upon before becoming the servant of man. It was all nonsense about organic matter in solution in well hydrolysed sewage being ever in excess of a properly constructed bacterial filter to deal with. Those who maintained the contrary would have to produce a quite exceptional sewage in order to prove their point, because in a well aerated filter as much as twenty-nine parts per 100,000 of nitric nitrogen had been obtained from a hydrolysed sewage, proving a capacity for nitrification by the bacterial process which was far in excess of anything that could be required in the case of a town sewage like that of Glasgow. In regard to much smaller communities than Glasgow and Birmingham there was the same absence of any recognised basis to work upon, and the author described the procedure of a small town in regard to the disposal of its sewage in order to illustrate what was being done. Proceeding, he said:—"In connexion with the year's progress suggestion made in my last year's address has already borne fruit. The passage is as follows:—

"'After having been in the grit chamber long enough to allow of the deposition of the detritus and in the anaërobic tank long enough to hydrolyse the organic matter, the raw incoming sewage should be diverted to a second set of grit chambers and tanks, and the liquid which has been longest in the anaërobic tank should then be circulated so as to pass again through the first grit chamber so as to complete the hydrolysis of the suspended organic matter, which will otherwise appear as sludge.'

"I predicted that the adoption of my suggestion was only a question of time, and this has been fulfilled. The suggestion has been carried out in a provisional manner by the engineer of one of the largest sewage works in the cou try, and has given most surprising and satisfactory results. It now appears that there is every prospect of being able to confine the difficulty of dealing with sludge to little more than the mineral detritus carried down by the sewers, which is inoffensive and easily dealt with. Moreover, it has been discovered that the deposit from open hydrolysing tanks which have been in constant use and undisturbed for four years, after being discharged over the surface

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of a field and dried, is indistinguishable from fine garden mould, and is absolutely odourless and inoffensive. The old question as to how far these aërobic changes, which occur in a properly constructed filter, can be depended upon to reduce the entire organic matter in solution in ordinary hydrolysed fluid is the only one that remains, and the answer, based upon a wide experience in Staffordshire and other districts, is quite positive. If a sufficient depth of filtering material is provided, and the requisite quantity of air for the life processes of the organism is supplied to them, there can be no doubt about the satisfactory character of the effluent. The only factors to be dealt with are:—(*a*) The depth of filter required to produce the necessary standard of purity in the effluent; (*b*) the quantity of air necessary for the life processes of the organisms; (*c*) the proper rate of flow per unit of filter bed surface in order to obtain the best results; and (*d*) the best period of rest between each discharge to prevent gelatinous growths in the filtering material. . . . Well, gentlemen, progress is being made very slowly, but I do not know of a single practical contribution that has come from an official source. The key-note of the system under which vast sums of money are being wasted is to make sure that everything is done in compliance with existing rules and regulations, whether these are flagrantly absurd or not. . . . Engineers and chemists seldom or never make any protest, but consider they have done their duty when they produce schemes which comply with the most outrageous official requirement. The compulsory purchase of absolutely unsuitable land and insisting in certain cases that the discharge of sewage must be limited to twenty-five gallons per head of the population when dealt with by bacterial processes are most outrageous requirements, but they have survived from conditions that in many cases are in no way applicable to the existing facts. It is to be hoped that next year will find that great improvements have been introduced and that economy combined with efficiency will follow."

Dr. Childs proposed, Mr. J. T. Hall (Staines), Chairman of Council, seconded, and Dr. Bostock Hill supported a vote of thanks to Mr. Scott Moncrieff at the close of the reading of the paper. The motion was agreed to, and Mr. Scott Moncrieff replied.

THE INSTITUTE OF BUILDERS.

THE Twentieth Annual General Meeting of the Institute of Builders, Incorporated, was held at the Registered Offices of the Institute, 31 and 32, Bedford-street, Strand, W.C., on the 16th instant, Mr. W. F. King, President, in the chair.

The minutes of the last meeting having been read and confirmed, the Report of the Council was read, as well as the audited accounts and balance-sheets of the Institute General and Benevolent Funds for the year ending December 31, 1903.

The Report referred to the agreement arrived at with the Royal Institute of British Architects on the question of the conditions of contract, which has already been dealt with in our columns, and the Council expressed a desire to place on record its high appreciation of the action taken in this matter by their President, Mr. King. The Council also acknowledged the valuable services rendered by the Conditions of Contract Committee, and by Mr. Benjamin I. Greenwood (President National Federation of Master Builders). The Report further stated that:—

"The new forms bear on their endorsement the seals of the Royal Institute of British Architects, the Institute of Builders, and the National Federation of Master Builders. . . . Judging by the large number of copies sold, it is evident that the agreed forms have been well received by architects and builders generally throughout the country.

"Your Council had before it various Parliamentary bills affecting the building trade, and took the necessary action to support those beneficial to builders and contractors and to oppose those which were detrimental. . . .

"Your Council has decided to continue its opposition to the Plumbers' Registration Bill.

"Your Council was invited by the London County Council to make suggestions as to amendments of the existing Building Acts. The matter was referred to the Institute Parliamentary Committee, which co-operated with the Parliamentary Committee of the London Master Builders' Association. The Joint Committee came to the conclusion that it was necessary for the members to have the draft of the proposed bill in their possession in order to make suggestions upon it, and the L.C.C. was so informed.

"Complaints continue to be received of the insistence, here and there, of architects upon priced bills of quantities being deposited with tenders. Your Council has taken up several cases in various parts of the country with satisfactory results. On a similar matter some correspondence has passed between this Institute and His Majesty's Office of Works, your Council objecting to contractors' priced bills of quantities being handed over by His Majesty's Office of Works to clerks of works. The reply was to the effect that a Government office cannot conduct its business on the same lines as those suitable to individual employers.

"Your Council has had under consideration the Corporation of London Proposed By-Laws, *re* demolition of old buildings. Representatives of this Institute met a committee of the Royal Institute of British Architects, and attended a meeting of the Streets Committee of the Corporation, at both of which the views of your Council were fully expressed. The original draft has been considerably modified, and further action will be taken if the by-laws submitted to the Local Government Board contain clauses prejudicial to builders.

"In accordance with the instructions of the last General Meeting, your Council has considered the question of a form of contract for sub-contractors. Many valuable suggestions were received from members of the Institute, and an analysis of them was laid before the Conditions of Contract Committee and referred to the solicitor. A form has been drafted, and will be laid before the Annual General Meeting. . . .

"In consequence of His Majesty's Office of Works having made the quantities a part of its contract, the necessity no longer exists for this Institute to appoint surveyors to take out the quantities on behalf of contractors for Government works.

"A conference, attended by representatives of this Institute, was held on the 19th June (1903), at the Building Trades International Exhibition, to consider matters relating to the 'Standard Size of Bricks.' The recommendations of the conference were as follows:—

"'(1) The length of the brick should be double the width plus the thickness of one vertical joint.

"'(2) Brickwork should measure four courses of bricks and four joints to a foot.

"'(3) Joints should be ½ in. thick and an extra $\frac{1}{16}$th, making $\frac{5}{16}$ths for the bed joints to cover irregularities in the bricks. This gives a standard length of 9¼ in. centre to centre of joints.

"'The bricks to be measured in the following manner:—

"'A. Eight stretchers laid square end and splay end in contact in a straight line to measure 72 in.

"'B. Eight headers side to side, frog upwards in a straight line to measure 35 in.

"'C. Eight bricks, the first brick frog downwards and then alternately, frog to frog, and back to back, to measure 21¼ ins.

"'A margin of 1 in. less will be allowed as to A, and ½ in. less as to B and C.

"'This is to apply to all classes of walling bricks, both machine and hand-made. . . .'

"Your Council regrets to report the loss by death of the following members:—Mr. Dudley C. Gayford, Mr. John Greenwood, Mr. B. E. Nightingale, Mr. S. T. Turtle, and Mr. G. Nelson Watts. Twenty-two new members have joined during the past year. . . .

"In accordance with the Articles of Association, the President, the Treasurer (Col. Stanley G. Bird, C.B.), one Vice-President (Mr. Woodman Hill), one Auditor (Mr. A. E. Parker), and four members of the Executive Council (Mr. B. Hannen, jun., Mr. W. Nicholson, Mr. A. F. Randall, and Mr. T. Rowbotham), will retire, but are eligible for re-election."

The Report and balance-sheets having been adopted,

The following elections were made for the ensuing year:—

President, Mr. C. H. Barnsley (Birmingham); Vice-Presidents, Mr. Woodman Hill (London), Mr. Jos. Bell, J.P. (Cambridge); Hon. Treasurer, Col. Stanley G. Bird, C.B. (London); Hon. Auditor, Mr. Edmund J. Hill (London); Executive Council, Mr. Jas. Carmichael (London), Mr. R. C. Foster (Rugby), Mr. L. Horner (London), Mr. T. Rowbotham, J.P. (Birmingham), Mr. C. W. Green (Liverpool).

A hearty vote of thanks was accorded to Mr. William F. King for so ably discharging the duties of President for the last two years.

The form of contract for sub-contractors was discussed and agreed to and the meeting then terminated.

PROPOSED IMPROVED STREET LIGHTING IN GLASGOW.—A meeting of the Watching and Lighting Committee of Glasgow Corporation was held on the 11th inst., when a report was submitted by a special committee which was appointed some time ago to consider how thoroughfares of the city might be better lighted than at present. It contained the following recommendations:—The adoption in the city of an improved system of incandescent gas lighting for all streets in which gas is used; the adoption of a suitable pattern of square lantern; the lighting of all car routes (not lighted by electricity) by two-burner lanterns, consuming 3¾ cubic ft. per hour; the lighting of all main streets, other than car routes, with single-burner lanterns, consuming 3¾ cubic ft. per hour, and all important crossings with double-burner lanterns; the lighting of all other streets with single-burner lanterns, consuming 2·8 cubic ft. per hour; the use of anti-vibrators in all lanterns erected in those streets in which heavy traffic prevails; that at street crossings transparencies indicating the names of the streets at the corners of which the lamps are situated be inserted in the lanterns; and that a staff of men be organised to inspect and attend to the burners and mantles. These recommendations were approved by the Watching and Lighting Committee. Mr. James D. Borthwick, Police Treasurer, estimated that the initial cost of the installation recommended would be 21,644*l.*, which, spread over eight years, would involve an annual charge of 2,706*l.*

THE LONDON COUNTY COUNCIL.

The first meeting of the newly-elected London County Council was held on Tuesday in the County Hall, Spring-gardens, when the following elections were made: As chairman, Mr. J. Williams Benn; as vice-chairman, Mr. E. A. Cornwall; as deputy-chairman, Mr. F. F. Alliston; and as aldermen: Sir Francis Mowatt, Mr. R. Strong, Lord Sandhurst, Mr. W. E. Mullins, Mr. Isaac Mitchell, Mr. W. S. Sanders, Sir W. B. Richmond, Mr. A. Fowell Buxton, Mr. Whitaker Thompson, and Mr. Edward White.

Loans.—On the recommendation of the Finance Committee sanction was given to Hampstead Borough Council to the borrowing of 1,000*l.* for making up a new street, and a loan of 10,000*l.* was granted to the Poplar Guardians for poor law purposes.

Oxford or Regent-Circus?—The Historical Records and Buildings Committee reported as follows:—

"Our attention having been drawn to the inconvenience which is caused owing to the indiscriminate use of the terms "Oxford-circus" and "Regent-circus" for the circus at the intersection of Oxford-street and Regent-street, we directed that communications should be addressed to the City Council of Westminster and the St. Marylebone Metropolitan Borough Council, inquiring whether they saw any objection to the removal of the name "Regent-circus" wherever it appeared at the locality in question, with a view to giving preference to the name of "Oxford-circus" which we are of opinion should be retained. The local authorities in both cases expressed their agreement with the proposal, and we have accordingly asked them to give effect thereto by removing the name tablets bearing the name "Regent-circus," and by obliterating that name in all cases in which it is possible to do so."

Stephenson's Engine.—The Joint Committee of the Bridges and Historical Records and Buildings Committee recommended that the open space at the Lambeth end of Westminster Bridge be used for the erection thereon of the "Invicta," the engine constructed by Stephenson, and which Sir David Salomons had offered to present to the Council.

Mr. Beachcroft moved that the matter be referred back, on the ground that the proper place for the ancient specimen was in a museum. If anybody offered the Council the first cab or sedan chair, would the Council undertake to place it in a similar position?

Mr. Burns seconded the amendment, and said the engine was not artistic enough to be placed in an open space.

Sir William Richmond said a more inconceivably ridiculous place than Westminster Bridge for the engine could not be imagined. They might just as well propose to put it on the top of St. Paul's.

On a show of hands, the amendment was carried by a large majority, and the matter was accordingly referred back.

The Council adjourned soon after five o'clock.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Hampstead.—Bay windows to blocks of flats to be known as Priory-mansions, on the north-east side of East Heath-road, Hampstead (Mr. J. F. C. Bell).—Consent.

Clapham.†—An iron and glass porch to Lancaster Lodge, Chivalry-road, Clapham, to abut upon Bolingbroke-grove (Messrs. Rogers, Chapman, and Thomas for Mr. J. H. Thomas).—Consent.

Dulwich.—One-story shops upon part of the forefronts of Nos. 38, 40, 42, and 44, Forest-hill-road, Camberwell (Mr. W. Goldsmith for Messrs. Rogers Brothers, Mr. R. W. Welford, and the trustees of the late Mr. Chissell).—Consent.

Dulwich.—Retention of an addition to the one-story shop at No. 94, Lordship-lane, Dulwich, abutting upon Chesterfield-grove (Messrs. W. Martin and Co).—Consent.

Hackney, Central.—A one-story show-room addition upon the existing one-story shops at Town Hall Buildings, Mare-street, Hackney, abutting upon The Grove (Mr. J. Hamilton for the Hackney Furnishing Company, Ltd.).—Consent.

Hackney, North.—That the application of Mr. C. Cheston for an extension of the periods within which the erection of houses on the site of No. 1, Clapton-common, Hackney, to abut upon the north side of Filey-avenue and the west side of Upper Clapton-road, was required

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to be commenced and completed, be granted.—Consent.

Hoxton.—Fixing of lettering on an iron and glass shelter in front of the Britannia Theatre, Hoxton-street, Hoxton (Mr. B. Crewe).—Consent.

Lewisham.—A porch in front of a proposed church on the south-eastern side of Torridon-road, Lewisham (Messrs W. D. Church and Son for the Rev. F. A. Trick).—Consent.

Paddington, South.—A one-story addition upon part of the forecourt of Nos. 24 and 26, Queen's-road, Bayswater (Messrs. Still, Wheat, and Luker for Messrs. Ushers Wiltshire Brewery Company).—Consent.

Dulwich.—An iron and glass shelter in front of the Lordship-lane Hall, to abut upon Woodvale, Lordship-lane, Dulwich (Mr. H. G. Brace for the Dulwich and Forest-hill Public Hall Company, Ltd.).—Refused.

Hackney, South.—A warehouse building at No. 17, Sutton-place, Hackney, to abut upon Urswick-road (Mr. J. Hamilton for Mr. T. C. Wootton).—Refused.

Islington, East.—That the request of Messrs. Crisp and Wilby for permission to retain a show-case on the forecourt of No. 100, Blackstock-road, Islington, be not granted.—Agreed.

Kensington, South.†—Buildings on a site abutting on the north-western side of Kensington-road and the eastern side of Melbury-road, Kensington (Messrs. Drivers, Jonas, and Co. for the Earl of Ilchester).—Refused.

Lewisham.—Buildings on a site abutting upon the east side of Mayow-road and north side of Sydenham-road, Lewisham (Messrs. J. Edmondson and Son for Mr. J. Edmondson).—Refused.

Paddington, North.—A one-story addition at the rear of Nos. 480 and 482, Harrow-road, Paddington, to abut upon Fernhead-road (Mr. F. L. Shepherd for Mr. J. Alexander).—Refused.

Strand.—A projecting shop front at No. 5, St. James's-street, St. James, Westminster (Messrs. Boehmer and Gibbs for Messrs. G. H. and A. Bywaters).—Refused.

Wandsworth (Detached).—One-story shops on part of the forecourts of ten houses on the north side of Rosendale-road, Herne-hill, to the westward of No. 1, Park-villas (Mr. P. C. Davies for Messrs. H. Block, R. Parry, H. Eaborne, and F. J. Chapman).—Refused.

Width of Way.

Brixton.—(*a*) That the resolution of the Council of November 17, 1903, consenting to the erection of a one-story shop upon part of the forecourt of Hebert House, Coldharbour-lane (Messrs. T. Laws and Sons) be rescinded. (*b*) A one-story shop, and sign-board over, upon part of the forecourt of Hebert House, Coldharbour-lane, Camberwell, with external walls at less than the prescribed distance from the centre of the roadway of Milkwell-yard.—Consent.

Hackney, Central.—That the application of Messrs. Still, Wheat, and Luker for an extension of the periods within which the rebuilding of No. 46, Morning-lane, Hackney, abutting upon Fox's-lane, was required to be commenced and completed, be granted.—Consent.

Holborn.—That the application of Mr. R. J. Worley for an extension of the periods within which the erection of a block of buildings on the south-east side of Shaftesbury-avenue, to abut also upon Vine-street, was required to be commenced and completed, be granted.—Consent.

Kennington.—The retention of a building adjoining No. 10, Frank-street, Kennington, with the forecourt fence at less than the prescribed distance from the centre of the roadway of the street (Mr. W. Bartholomew for Messrs. Richardson and Kingston).—Consent.

Southwark, West.†—A building on the west side of Mansfield-street, Southwark, with external walls at less than the prescribed distance from the centre of the roadway of the street (Messrs. R. Hoe and Co.).—Consent.

Kennington.—A building at the rear of No. 130, Dorset-road, Kennington (Messrs. Flood and King for Mr. F. C. N. Flood).—Refused.

Space at Rear.

Kensington, South.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of blocks (Nos. 6 and 7) of residential flats on the south-east side of Brompton-road, Kensington, with open spaces about such blocks (Mr C. W. Stephens for Harrod's Stores, Ltd.).—Consent.

Stepney.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of No. 50, Fieldgate-street, Stepney, with an irregular open space at the rear (Mr. J. E. Mullett for Mr. I. Lewis).—Consent.

Kensington, South.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the erection of a building at No. 40, Hyde-park-gate, Kensington (Mr. R. J. Worley).—Refused.

Paddington, South.—An addition at the rear of No. 24, Craven-hill-gardens, Paddington (Messrs. F. T. Bruton and Sons).—Refused.

Deviation from Certified Plans.

Holborn.—Certain deviations from the plans certified by the District Surveyor, so far as relates to the re-erection of No. 16, Ormond-yard, Queen's-square, Holborn (Mr. T. Wilson for Mr. W. C. Gidden).—Refused.

St. George, Hanover.—Certain deviations from the plan certified by the District Surveyor, so far as relates to the rebuilding of No. 94, New Bond-street, St. George, Hanover-square (Mr. W. J. Ancell for Messrs J. Lyons and Co., Ltd.).—Refused.

Width of Way and Lines of Frontage.

Kensington, South.—Buildings on the west side of Melbury-road, Kensington, to abut also upon Holland-park-road (Messrs. Drivers, Jonas, and Co. for the Earl of Ilchester).—Refused.

Mile-end.†—Three buildings with one-story shops in front on the west side of Coborn-road, Mile-end, southward of No. 3, Coborn-road (Messrs. Hammack, Lambert, and Son for Mr. J. J. Musto).—Refused.

Line of Frontage and Construction.

Hampstead.—The retention of a coal-shed at the rear of No. 1, Akenside-road, Hampstead, abutting upon Lyndhurst-road (Messrs. G. W. and H. G. Potter for Mr. F. W. Smith).—Consent.

Holborn.—An iron gangway across Castle-street, Farringdon-road, Holborn (Messrs. Lander, Bedells, and Crompton for Messrs Falk, Stadelmann and Co., Ltd.).—Consent.

Formation of Streets.

Wandsworth.—That the application of Mr. R. Robertson, for an extension of the period within which new streets on the Totterdown-fields estate, Upper Tooting-road, Wandsworth, were required to be clearly defined throughout and thrown open to the public as highways, be granted.—Consent.

Building for the Supply of Electricity.

St. Pancras, East.—A deviation from the plans approved on May 12, 1902, for the construction of an addition to a generating-station and works on the north side of Pratt-street, St. Pancras (Mr. S. W. Baynes for the Council of the Metropolitan Borough of St. Pancras).—Consent.

Alteration of Buildings.

St. George, Hanover square.—An addition at No. 425, Oxford-street, St. George, Hanover-square (Mr. R. P. Kennedy for Messrs. Thrupp and Maberly).—Consent.

St. George, Hanover-square.—The uniting of Nos. 178 and 179, New Bond-street, St. George, Hanover-square, with an irregular open space at the rear (Messrs. E. Wimperis and Best).—Consent.

Width of Way and Construction.

Fulham.—The retention of a wood and iron building at the rear of the "Live and Let Live" beer-house, North-end-road, Fulham, abutting upon Portland-street (Mr. W. Stewart for Messrs Mann, Crossman and Paulin, Ltd.).—Consent.

Rotherhithe.—An iron shed on the north side of Rotherhithe-street, Rotherhithe (Messrs. Croggan and Co. for Messrs. Quirk, Barton, and Co.).—Consent.

Means of Escape at Top of High Buildings.

Paddington, South.—Means of escape in case of fire proposed to be provided on the sixth story of Nos. 12-17, Hyde-park-place, Bayswater-road, Paddington (Mr. F. T. Verity for the executors of the late Mr. A. Bush).—Consent.

Height of Buildings.

Southwark, West.—Retention of an addition to the premises of the Amalgamated Press, Ltd., on the south side of Lavington-street, Southwark, exceeding in height the width of that street (Mr. H. O. Ellis).—Consent.

The recommendations marked † are contrary to the views of the local authority.

KING'S COLLEGE HOSPITAL.—The President of the Royal Institute of British Architects has nominated Mr. Rowland Plumbe, who accepts the appointment, to act as assessor in the competition for the designs of the projected new Hospital buildings at Denmark-hill, Camberwell, to accommodate 600 beds. The Ecclesiastical Commissioners have promised to contribute 2,500*l.* towards the Removal Fund, having regard to the fact that the Hospital will be erected upon a site in proximity to their large estates in South London and to the benefit which will thereby result to the poorer residents upon their property there. Towards the estimated initial expenditure of 300,000*l.* the total sum thus far subscribed amounts to 106,763*l.*, and a former patient will give 50,000 bricks of his own manufacture, delivered at the new works.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The monthly meeting of the Sheffield Society of Architects and Surveyors was held on the 10th inst. in the Lecture Hall of the Literary and Philosophical Society, Leopold-street. Mr. T. Winder presided. Mrr. J. R. Wigfull, one of the local secretaries for the congress held in Sheffield last August, gave a lecture entitled "In Worksop and Neighbourhood with the British Archæological Association." His remarks were descriptive of one of the day's excursions undertaken by members and friends of the Association. Selecting the churches of Blyth, Worksop, and Steetley, he showed by means of plans and views their history and characteristic features. These churches, he said, were all of the Norman period, and formed excellent examples for the study of that style, as they embraced all the phases of the style from the somewhat rude and archaic work of Blyth to the perfected and semi-transitional work at Worksop. The latter, however, suffered extensively when the church was "thoroughly restored" in 1847. Most of the original features were then so reworked or replaced by new material as to give the idea at first of a new church. Some features of interest remained, notably the XIIIth century chapel and the beautiful ironwork on the south doorway. The lecture was illustrated by numerous lantern slides, exhibited by Mr. J. Atkinson, of University College. On the motion of Mr. C. M. Hadfield, seconded by Mr. W. Potts, and supported by Messrs. W. J. Pale, Horace Wilson, and E. Howarth, a hearty vote of thanks was accorded to the lecturer.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the eighth sessional meeting of this Society, Mr. Butler Wilson presiding, a paper on the "Sketching Excursions of the Birmingham Architectural Association" was read by Mr. C. E. Bateman, illustrated by 150 lantern slides prepared by Mr. John Ward These covered most of the ground traversed by the Society during the past ten years, which was indicated by a map embracing the following centres of operation:—Broadway, Ludlow, Oxford, Tewkesbury, Cambridge and Ely, Cirencester, Stamford and Peterborough, Burford, Banbury, and Kettering.

GLASGOW ARCHITECTURAL ASSOCIATION.—On the 8th inst. Professor Charles Gourlay delivered a lecture on "Athens and its Architecture" to the members of this Association, the Vice-president, Mr. James Lochhead, being in the chair. The lecturer gave the impressions he formed while studying architecture in Athens last year. Beginning with a general description of the beautiful situation of the city and of the Acropolis, he afterwards dealt with the lighting of the Parthenon, the peculiarity of position of the Panathenaic frieze on the Parthenon, and the suitability of its design and execution for its position. The Propylæa was next referred to as showing how much, due to its unfinished state, may be learnt regarding Greek methods of construction; the temple of Niké Apteros—the gem of the Acropolis; the Erechtheion, with its wonderful beauty of detail and the variations in its carving. Then the buildings on the plain were referred to, including the Theseion, the Choragic Monument of Lysicrates, also the Stelæ in the Ceramicus and in the National Museum, and the Olympeion and the Horologium of Andronicus Cyrrhestes, as owing their existence to foreign patrons of the city. Then followed the work of the Roman period in Athens as may be seen in the gate to the Agora, the monument of Philoppappus, the arch, and the library of Hadrian, the latter with its colour obtained by the use of different-coloured marbles instead of by painting the marbles according to the ancient Greek practice. The work of the Christian period was next referred to, particularly that to be found in the churches of St. Nicodemus, the Saints Theodore, the Kapnikarea, and the small Metropolis. Lastly, modern work as exhibited in the Academy of Science, the University, and the Library—all on the University Boulevard; also the modern Cathedral, the Royal Palace, the Observatory, etc. The lecture was illustrated by a large number of photographs and drawings, and by sketches drawn by the lecturer in Athens.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual meeting of the Northern Architectural Association was held on the 9th inst., in the rooms of the Association, 36, Northumberland-street, Newcastle, the President (Mr. J. Walton Taylor) presiding. The annual report was submitted by the Secretary, Mr. A. B. Plummer, from which it appeared that since the last report

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15 members, 18 associates, and 18 students have been elected, and the total membership is now 224 as compared with 203 in the previous twelve months. The Report stated that a letter had been sent during the year to the City Council protesting against the Corporation officials carrying out public architectural works, and this was duly presented at a meeting of the Council. The library report showed that several additions had been made to the books. The demand had shown no falling off, the issues being 240 in all. The financial statement placed the receipts, including a balance in hand of 74*l.* 18s. 4d., at 209*l.* 9s., and, after meeting expenditure and investing 50*l.*, there was a balance of 49*l.* 4s. 10d. The reports were adopted, and the following officers were elected for the ensuing year:—President, Mr. J. W. Taylor; Vice-President, Mr. J. T. Cackett; Secretary, Mr. A. B. Plummer; Treasurer, Mr. R. Burns Dick; Librarian, Mr. H. C. Charlewood; with the members of the Council, who were re-elected.

ARCHÆOLOGICAL SOCIETIES.

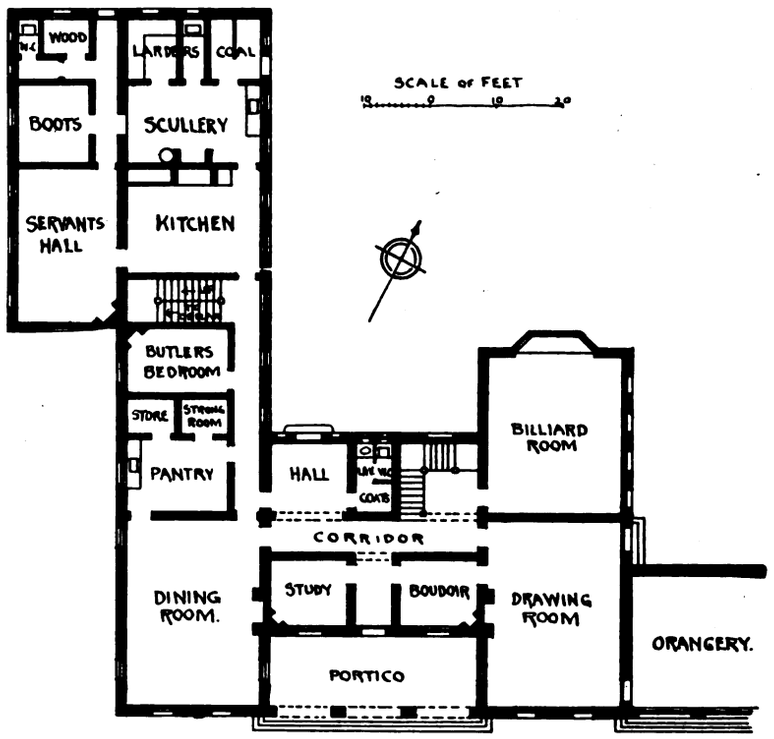
SURREY ARCHÆOLOGICAL SOCIETY.—The Surrey Archæological Society has announced that it has now completed the excavations upon which it has been engaged for several years on the site of the ancient Cistercian Abbey of Waverley, at Farnham, as further work would not be likely to be sufficiently fruitful in discoveries to justify the expenditure involved. The Society report that the importance of the work is shown by the fact that the plan which it has now been possible to draw of the conventual buildings is the most complete of any which has as yet been made of a Cistercian house. It is proposed to reproduce this plan in colour, and on the same large scale that has already been adopted for Fountains and other abbeys, in illustration of a full account of Waverley Abbey which Mr. Harold Brakspear will contribute to the Society's collections. Reporting upon last season's excavations, the Society states that an examination of the ground north of the brewhouse resulted in the discovery of a large block of buildings, consisting of a small chamber, placed east and west, and a much larger building to the north of it, the work being of the XIIIth century. Projecting west from the large building was an added building, divided into three aisles by wooden posts on chamfered stone bases. Mr. Harold Brakspear's impression was that the small chamber was a kitchen, and the building to the north the house for inferior guests; that to the west would then be the secular infirmary. 'A thick boundary wall to the north-west was followed. This turned at a sharp angle and ran on westward, and terminated in a small room, apparently of the XIIth century, with a doorway on the north and a fireplace on the east. North of this was a large barn, with a doorway on the east, opening out into a paved yard of considerable extent. South of the barn a large number of walls were found, but they all belonged to a period posterior to the suppression of the Abbey. The search for the gatehouse in this direction was unsuccessful. Some very interesting investigations were also made on the site of earlier excavations, with the object, successful in many cases, of clearing up doubtful points.

Illustrations.

VILLENEUVE-LES-AVIGNON: A VIGNETTE.

ACROSS the rushing waters of the Rhone lies the dead little town, its ragged roofs faded to cinder-colour by the heat of the southern sun. To reach it we traverse the Ile de la Barthelasse and the wooden bridge that leads to the opposite bank, and take the winding road that brings us close under the shadow of the tall isolated tower of Philippe-le-Bel. From here a slight bend to the left and we see the towers of the ancient fortress of Saint André standing above the sloping, sombre-coloured roofs of the town. Villeneuve is a vast ruin, or rather an accumulation of ruins—no modern buildings link the past and present; it belongs wholly to the Middle Ages. The once stately mansions of ecclesiastics and nobles now give dubious shelter to the poorer classes, and the household washing flaps and bulges prosaically from balconies and bays. The spacious courtyards are strewn with a decrepit multitude of objects—broken earthenware, dilapidated rush-bottomed chairs, rusty iron hoops, discarded implements of agriculture, and slimy garbage.

The old castle stands silent and dismantled, facing the grey mass of the Papal Palace across the water. Within the famous Chartreuse children sprawl barefooted on the refectory steps; the fresco s on the cloister walls, once bright and beautiful, are now dank and crumbling; the canopied well in the central court is overgrown with moss and lichen, and grass grows luxuriously between the flags—everywhere a feeling of neglect, a musty odour of decay. J. PERCY WADHAM.



Sketch for a House for the Isle of Wight. Plan.

ENTRANCE HALL, "ELVEDEN."

THIS drawing illustrates the entrance hall in the additions recently completed. The enriched plaster dome is carried by marble columns with alabaster caps and bases. The walls are panelled in wainscot, left natural, up to the cornice. CLYDE YOUNG.

GARDEN FRONT, HOUSE ON THE HADLEY ROAD.

WE give an illustration of the garden front of this house, of which the other front, with a plan and description, was published in our issue of September 19, 1903.

The present illustration was exhibited in last year's Royal Academy.

SKETCH FOR HOUSE, ISLE OF WIGHT.

THIS sketch for a house, by Mr. G. O. Scorer, was designed for a site overlooking the sea. The materials to be used were Portland stone and red brick—a feature of the house is the orangery or winter garden. The work has not at present been carried out.

The drawing was exhibited at the Royal Academy last year.

HOUSE, 37, CHEYNE WALK.

THE original history of the site of this characteristic house, and of the name given to it, the "Magpie and Stump," is indicated on the drawing. The front is a good example of effect obtained by very simple means, though the large egg and tongue ornament under the cornice is to our mind out of scale with the rest. The tinting of the original drawing was unfortunately not such as to come out well in lithographing, which has rather spoiled its appearance in the illustration.

BOOKS RECEIVED.

THE MODERN CARPENTER AND JOINER. Edited by G. Lister Sutcliffe. Divisional-volume VII. (The Gresham Publishing Co.)

THE GREAT MASTERS: Reproductions in Photogravure. Part X. (W. Heinemann. 5s.)

LITTLEHAMPTON, ARUNDEL AND AMBERLEY. By W. Goodliffe. (The Homeland Association. 6d.)

FIRE AND EXPLOSION RISKS. By D. Von Schwartz. Translated by Charles T. C. Salter. (Charles Griffin and Co. 16s.)

COMPULSORY TAKING OF LAND BY PUBLIC COMPANIES, ETC. By Thomas Waghorn. (Effingham Wilson. 2s.)

Correspondence.

THE ARCHITECTURAL ASSOCIATION.

SIR,—I was unable to attend the special meeting when the proposed change of the day of meeting was discussed.

We have grown so accustomed to Friday that I shall be sorry to see any change made. The meetings have always been well attended, but the Jewish members and the week-enders should be considered.

I think that Monday will not suit the latter gentlemen, and it will prevent members of the Surveyors' Institution attending. I suggest that Tuesday be the day selected. There are very few meetings on that day, and the room put in order for the R.I.B.A. meeting on the Monday would remain ready for the A.A. on the Tuesday.

I conclude that meetings will be held at the new quarters after this session; there would be some loss of dignity, but some gain in convenience. HENRY LOVEGROVE.

BUILDING BY-LAWS REFORM ASSOCIATION.

SIR,—The attention of my Executive Committee has been drawn to the report of the First Annual Meeting of this Association in your issue of the 4th inst., and I am directed to point out that your reporter (no doubt by inadvertence) has failed to do justice to the outgoing Council of the Association.

With regard to the amendment moved by Mr. Shallcross to refer back the report of the Council, no mention is made of the following facts:—

(1) That after discussion the gentleman who seconded the amendment asked Mr. Shallcross if he would withdraw the amendment, but it was pointed out that such a course was not permissible.

(2) That the seconder when the amendment was put to the vote abstained from voting.

(3) That Mr. Shallcross alone supported his own amendment; and (4) that when the resolution to adopt the report was put the whole meeting except Mr. Shallcross voted for it.

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The matter would be of little importance but for the danger there is that your readers may by the expressions "lost by a majority," "carried by a majority," be led to think that the Association is divided.

The truth is exactly the opposite. Fortunately the Association consists of members of varied views and experience in reference to building by-laws. It is equally fortunate that the Council are agreed upon the best course to be pursued in order to attain the object for which the Association was formed.

R. A. READ, Hon. Secretary.

***Our own representative was not present at the meeting. We relied on a report forwarded to us, which was apparently not as accurate in detail as it ought to have been.—ED.

LONDON BUILDING ACT, 1894:

TRIBUNAL OF APPEAL CASE.

THE Tribunal of Appeal under the London Building Act, 1894, met at the Surveyors' Institution, Great George-street, Westminster, on Tuesday, to hear an appeal by Mr. William Woodward (for Messrs. White and Co. and Mr. F. Sweetland) under section 43 (iii.) against the decision of the London County Council in the matter of the erection of a building on the site of 61, 62, and 63, Jermyn-street, Piccadilly. The members of the Tribunal present were Messrs. Penfold, Hudson, and Grüning.

Mr. Woodward conducted the case for the appellant, and Mr. Andrews, from the solicitors' department of the London County Council, appeared on behalf of the respondents.

Before the merits of the case had been entered upon, Mr. Andrews raised an objection on a point of procedure. He submitted that there had been no proper application to the Council within the period which enabled this appeal to be brought, inasmuch as a certain letter of the appellant was not an application, and the reply of the Council was not a decision within section 3 of the Act. Mr. Andrews further pointed out that the refusals of the County Council in September and October, which the appellant did not appeal against within fourteen days, could not now be proceeded with, as the time for such appeals had expired.

Mr. Woodward protested that in the Building Act no time was mentioned within which an appeal must be brought before the Tribunal.

Mr. Hudson pointed out that a matter of procedure of this kind was controlled by the regulations of the Tribunal, framed under section 182, and approved by the Lord Chancellor. One of these regulations, which prescribed fourteen days as the limit within which an appeal might be lodged, had, therefore, the force of law.

Mr. Woodward: Then, I am bound to confess that the fourteen days' regulation had escaped my notice.

Mr. Hudson: Unless the other side consents we have no power to extend the time. You are, therefore, in the hands of the County Council's representative.

Mr. Woodward said, that being so, he could hardly believe that the County Council would, on a most technical point, decline to allow a case like this to go before the Tribunal. He, therefore, appealed to the Council's solicitor not to allow his oversight to prevent the appeal being decided upon.

Mr. Andrews: For my part I am not afraid of this case on its merits, but if I waive my objection it will be on two refusals by the County Council, and, in the third place, on a document which, as I say, was not a regular application. There is a way out of the difficulty. If Mr. Woodward would put before the Council an entirely new application, there might be a possibility of an arrangement by an alteration of the route.

Mr. Woodward said he would like to go on with the case arising out of the second refusal.

Mr. Hudson: I do not see how Mr. Andrews can consent to that—he is not the London County Council.

Mr. Woodward pointed out that Police Court proceedings were to take place that afternoon. He wished to ask Mr. Andrews whether, if his suggestion were adopted, he would ask for the adjournment of the case.

Mr. Andrews could not pledge himself. It might possibly be convenient to inform the magistrate that they had both agreed to an adjournment pending a further application. But, in the meantime, no building must be done.

Mr. Woodward said his client was anxious to know whether, in the event of fresh plans being presented, Mr. Andrews would consider them *de novo*.

Mr. Andrews replied that personally he had nothing to do with such an application, but he was satisfied that if a reasonable scheme were submitted, the Council, which had not formed any preconceived notion, would duly consider it.

Mr. Woodward agreed to accept the suggestion of Mr. Andrews and to submit a fresh application to the Council, whereupon Mr. Andrews asked for cost of that day's proceedings.

The Chairman said the Tribunal agreed to the course taken, and thought 5*l.* would be an adequate order as to costs.

Mr. Andrews: The Council is always reasonable in the matter of costs in a case of this description. He added that if Mr. Woodward saw the District Surveyor there would doubtless be no difficulty in preparing a scheme which would obviate the defects of the previous ones.

ROYAL COMMISSION ON LONDON LOCOMOTION.

AT the sitting of the Royal Commission on London Locomotion on Thursday last week evidence was given by Mr. H. Howard Humphreys, Consulting Engineer to the National Traction Engine Owners' and Users' Association. Witness stated that the use of traction engines and heavy self-propelled vehicles was growing with considerable rapidity owing to the great use being made of them for the haulage of heavy plant and timber and the removal of building material from areas which were being cleared. He advocated that such vehicles should be allowed to proceed at 4 miles an hour instead of 2 miles. If the use of such vehicles were limited the cost of building generally would be enhanced. The roads of London were well adapted to traction-engine traffic, and would not be injured if the wheels of the engines were kept within the limitation. He objected to the proposed L.C.C. by-laws to limit traction engines to main thoroughfares.

The Hon. J. Scott Montagu, M.P., gave evidence, and expressed the opinion that if means were taken to get the traffic to move quicker there would be less necessity for widening thoroughfares.

Mr. Charles Booth considered that improved facilities for travelling were wanted in London, for in no other way could the insufficiency and dearness of house accommodation be obviated. If London were to be laid out now there was no doubt there would be two or three levels.

At the sitting of the Commission on Friday Major-General Webber stated that, as Officer in the Postal Telegraph Service, Chief Engineer of the City of London Electric Lighting Co., founder of the Chelsea Electric Light Co., and in other capacities, he had an intimate acquaintance with the thoroughfares of London and their construction and maintenance. He advocated the construction of a tube railway from Clapham Junction to Paddington, and said that the London clay was better adapted for tube railways than was the case with any other city he knew of. Between 1870 and 1894 he had laid conductors of telegraph, telephone, and electric light under the streets in the City aggregating several thousand miles. With regard to telegraph cables, he advocated the "draw in and draw out" system, which, although more expensive, reduced interference with the streets to a minimum. In the City all the space available between the paving of the footways and the cellars on the great east and west lines of traffic had been appropriated. As regarded the ideal conditions of the provision of subways under the streets, one must have worked, as he had, in most of the streets of the City to realise the impossibility except at enormous cost and vast interference with the several services. If the L.C.C., in the construction of entirely new streets, could provide subways from curb to curb of the footway they would demonstrate the ideal, but it would be enormously costly. Under 99 per cent. of the streets of the Metropolis such subways would be altogether out of the question. The practice of local authorities restoring the roadway after disturbance in the laying of pipes, cables, etc., had led to the undertakers being charged a very high percentage above that which they could do it with their own staff, and the men employed by the Boroughs were very far from being good pavers. His own experience was that when the surveyor was a practical engineer, and had a free hand, the inconvenience of disturbance was minimised.

Mr. R. Elliott-Cooper, C.E., expressed a strong opinion that tubular railways worked by electricity and passing beneath the public streets and roads, linking up well-recognised centres, was the best means of relieving the congestion in London, except on some routes south of the Thames where an overhead railway would be more convenient and cheaper. He designed the Hammersmith, City, and North-East London Railway, which, after passing through the Commons, failed in the Lords Committee in 1902. The line was 23¾ miles long, and would cost 7,232,947*l.* It was proposed to run from Hammersmith, viâ Piccadilly-circus, Strand, Fleet-street, Cannon-street, Fenchurch-street, Bishopgate-street, Shoreditch, Hackney, to Abney Park Cemetery. From this point there would be two branches, one *viâ* Tottenham to Palmer's Green, and the other to Walthamstow. The terminal station at Palmer's Green would facilitate the development of the building property in the neighbourhood, while the Walthamstow branch would make available for building purposes districts on the outskirts of Walthamstow and Leyton. He believed that this scheme, if carried out, would go far to relieve the congestion of traffic in London.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held at the City Hall, Charing Cross-road, S.W., on Thursday last week.

Estimates.—The Finance Committee submitted a number of estimates for the year ending March, 1905, which were agreed to. Among them were the following:—Alterations to entrances Buckingham Palace-road Library, 100*l.*; additional storage accommodation at Belgrave Wharf, 170*l.*; renewal of sewer, New Burlington-place, 295*l.*; paving works, New Tothill-street, 600*l.*; repairs Dufour's place depôt, 250*l.*; repairs Farm-street depôt, 200*l.* The Committee reported receipt of an order from the L.C.C. authorising the borrowing of 1,136*l.* in connexion with the Roehampton-street extension.

Fire Insurance.—The General Purposes Committee reported that they had given instructions for the insurance of the City of Westminster Dwellings, Regency-street, in the Alliance Assurance Co. for the sum of 48,000*l.*

Combined Drainage.—The Works Committee reported having considered a letter from the St. Pancras Borough Council forwarding a copy of a communication which had been addressed to the London County Council, and asking the City Council to support the action taken. The letter drew attention to the fact that when premises within one curtilage are subdivided into premises within two or more curtilages, the existing drain takes the drainage of more than one premises; that this subdivision takes place without the knowledge or sanction of the Council, and consequently the drain becomes a sewer. The Borough Council were of opinion that there was only one method of preventing a liability for private premises of this kind being thrown upon the public rates, and that was by making it compulsory for the owner to provide and deposit with the sanitary authority plans of the whole of the subdivided premises and of the whole of the drainage. In the case of plans not being deposited within three months of subdivision, or not being passed by the sanitary authority, then that authority should have power to compel the owner to put in separate drains to the sewer. In conclusion, the letter requested the L.C.C. to draft and promote a Bill in Parliament embodying these suggestions. The City Council concurred in the views expressed in the letter, and it was agreed to communicate with the L.C.C. in support thereof.

Paving Works.—The Works Committee recommended, and it was agreed, that the carriage-way of West Strand and Strand from 10 yds. west of Agar-street to the east side of Terry's Theatre should be repaved, the selection of material to be deferred until after the tenders were received. The paving will be either hard wood, soft wood, or asphalte, the space to be paved having an area of 5,400 sq. yds.

Amended By-law.—The Public Health Committee reported having considered an amendment of the By-law 26 made by the L.C.C. under section 39 of the Public Health (London) Act, 1891. The by-law, as amended, provides that the landlord or owner of any lodging-house should not be deemed to have offended against the requirement to maintain in connexion with such house water-closet, etc., accommodation in the proportion of not less than one water-closet for every twelve persons until the sanitary authority should have caused notice to be served on such landlord or owner requiring such provision to be made. On the recommendation of the Committee, it was agreed to inform the L.C.C. that the City Council approved of the proposed amended by-law.

ATHENÆUM CLUB.—On March 10 the Committee of the Club elected Mr. Aston Webb, R.A., as a member under the provisions of their Rule II., which empowers the annual election by the Committee of nine persons "of distinguished eminence in science, literature, the arts, or for public services."

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COURT OF COMMON COUNCIL.

THE Lord Mayor presided on Thursday of last week over the usual fortnightly meeting of the Court of Common Council held at the Guildhall.

Mr. Sidney J. Sandle proposed the following motion:—"That, having regard to the verdict of the jury at the inquest on the victims of the recent fire in Duke's Head-passage, Ivy-lane:—(*a*) It be referred to the Streets Committee to consider and report as to the desirability of giving effect to the following suggestions:—(1) That all posts obstructing the entrances to passages in Ivy-lane and other parts of the City be removed; (2) that the City authorities obtain powers, if they do not already possess them, to inspect all buildings and compel owners to provide proper means of exit through the roof by fixed ladders or other suitable means. (*b*) It be referred to the Improvements and Finance Committee:—(1) To obtain information with a view to ascertain the cost of carrying out the jury's recommendation to make a short street between Ivy-lane and Paternoster-square in the place of Duke's Head-passage, and thus do away with the dangerous obstructive buildings at both ends of this passage; (2) to prepare a return of the passages and alleys in the City of London which have obstructive buildings over their entrances, with a view to such action being taken which may be thought advisable in the interest of public safety, when suitable opportunities occur.

Mr. Sandle said he hoped that the suggestions of the fire and police authorities that all posts obstructing entrances to narrow passages should be done away with would be carried into effect. With regard to the rider of the jury in the present case, that owners of houses in the City should be compelled to provide proper means of exit through the roof by fixed ladders or other suitable means, he thought that immediate action should be taken to secure its being carried into effect.

Mr. Downes said that Duke's Head-passage was a veritable death-trap, and the only wonder was that more lives were not lost at the recent fire.

Mr. Morton thought there was no doubt but that Parliament would immediately support any Bill based on the lines of the jury's recommendations, and, having regard to the urgency of the case, he trusted that immediate action would be taken. He hoped that in the future the Court would take particular care in the matter of granting permission for bridges to be erected over narrow passages

Mr. Hollington protested against panic legislation, and asked the Court to adjourn the consideration of the matter. There were houses in the City where the provision of means of access on to the roof would result, in the case of panic, in more serious loss of life than if such exits did not exist.

The motion was agreed to.

OBITUARY.

MR. P. P. PUGIN.—We regret to have to record the death, in his fifty-third year, of Mr. Peter Paul Pugin, of the firm of Pugin and Pugin, architects, which took place at Bournemouth on the 10th inst. Mr Pugin was the third and youngest son of Augustus Welby Pugin, the most illustrious of the name, who was so great a figure in the Gothic revival. Following in the footsteps of his two elder brothers, he embraced the profession of architecture, and rose to a position of considerable distinction therein, his clients among the Catholic clergy in England and Scotland being very numerous. Of the principal architectural works carried out by Messrs. Pugin and Pugin we may instance the following, indicating with an asterisk the dates on which illustrations and plans were published in our columns:—The Franciscan Church at Glasgow (1879); the Presbytery at Ormskirk (1880); St. Joseph's Roman Catholic Church at Greenhill, Swansea (November 19, 1887*); St. Peter's College at Bearsden, Glasgow, for fifty resident ecclesiastical students of the Roman Catholic Arch-diocese of Glasgow (September 21, 1889*); and the Abbey Church of the Benedictine Monastery at Fort Augustus, N.B. The church built of grey granite, is 300 ft. in length, and has a tower 260 ft. high (1890-1). Messrs Pugin and Pugin were selected, with fourteen other competitors, to submit designs (October 15, 1887*) for the new façade of Milan Cathedral. Their designs, we should mention, were exhibited with the rest, but, having arrived too late by reason of a delay in transit, were not reckoned as eligible for the actual competition. The firm prepared the plans and designs for an enlargement, doubling the capacity, of the Church of the Sacred Heart in Talbot-road, Blackpool (1895); for the Roman Catholic Churches of St. Patrick, for about 1,000 seats, at Shieldmuir, near Motherwell, co. Lanark (1897-8); of St. Mary, at Heaton Norris (1897); in Portugal-street, Glasgow (1896-7); St. Augustine, in Buchanan-street, Coatbridge, co. Lanark (1897-9); of St. Patrick, in North and William streets, Anderston, Glasgow (1896-7); in Cannock-street, Greenock; at Thornton, Lancashire (898); and of Our Lady of the Angels and St. John the Evangelist at Princethorpe, Warwickshire, together with the new laundry block, bakery, kitchen, and other domestic buildings there (Mr. Pugin). In May, 1884, Messrs Pugin and Pugin were appointed as the architects for the restoration, together with extensive additions, of the Old Palace at Mayfield in Sussex. They made the plans and designs for several other Roman Catholic edifices, including the churches of Our Lady of Lourdes and St. Bernard in Kingsley-road, Liverpool, opened in May, 1901; St. Thomas of Canterbury, at Port Clarence, co. Durham; of St. Joseph, at Skerton, Lancashire, and of the school chapel there (1896-1900); the chapel erected by the congregation of the Church of Our Lady of Good Aid at Motherwell, Glasgow, which has a capacity for 1,000 persons, and was opened on December 9, 1900; at Haverton Hill, in the county of Durham; at Aigburth, in the county of Lancaster, opened on May 27, 1900; the Franciscan Church of St. Bonaventure, in Egerton-road, Bishopston, whereof the first portion, with part of the Friary at Horfield (also by them), was completed in the summer of 1900; the Roman Catholic churches of St. Joseph, in Slyne-road, Lancaster, and of St. Patrick, in Main-street, Coatbridge (1895-96); and the lady-chapel and sacristies for the Church of All Saints, in Barton, Lancashire. Mr. Pugin designed the reredos of the Roman Catholic Church of St. Joseph at Dundee, and the stained-glass window of the Roman Catholic Church of St. Augustine, at Forest Gate; the firm made the designs for the memorial tablet to the late Rev. James McIntosh in St. Margaret's Church, at Airdrie, co. Lanark (1895); the new high altar of Caen stone and the reredos for the Roman Catholic Church of Our Lady at Birkenhead; the altar, tabernacle, relic cases, etc., for the Roman Catholic Cathedral of St. John at Salford; the Canon O'Keefe memorial altar in St. Patrick's at Coatbridge, near Glasgow (1902); and the altar, executed in marble and Caen stone for the Roman Catholic Church of St. Mary at Morecambe. In 1898-9 the firm completed, with a chancel, the Church of the Sacred Heart in Quex-road, Kilburn, of which the nave was begun some twenty-five years ago; two years ago they added to the Notre Dame Training College at Liverpool the two blocks facing Mount Pleasant, which comprise respectively the recreation hall and dormitory, and the music, science, and art rooms, lecture hall, class-rooms, and laboratory. They were architects also of the large and important Roman Catholic Church of St. Peter, with chapels, sacristy, and presbytery, built throughout of red sandstone, in 1901-2, at Partick, Glasgow. Their most recent work includes the new Industrial Schools for about 140 girls at Blackbrook, near St. Helens, Lancashire, begun in August of last year. Mr. Pugin was the author of a paper upon the work of the late A. Welby Pugin, which he read on March 5, 1900, to the Philosophical Society of Glasgow. In 1886 Mr. Pugin married the third daughter of the late Mr. John Bird, of Brook Green, Hammersmith, W., by whom he leaves five children. Some two years later he was created a Knight of St. Sylvester by the then Pope Leo XIII. as a token of recognition of the work he had done for the Catholic body in Great Britain in the course of his professional career. We may add that Mr. Pugin designed over four hundred and fifty altars in all parts of England and Scotland, and designed the marble tablet in memory of the late Cardinal Vaughan which has just been set up, by the Sisters, in the cloister of Narazeth House, Hammersmith. He was buried on Tuesday last, in the family vault at Ramsgate.

MR. T. COX.—The funeral of Mr. Thomas Cox, architect and surveyor, Hackins-hey, took place at Kirkdale Cemetery, Longmoor-lane, recently. The deceased, who had been in ill-health for some time, passed away at his residence, 60, Queen's-road, Bootle, in his fifty-seventh year. He went to Liverpool about thirty-two years ago, and for the last twelve years had been the architect for the Bootle School Board. He had also done a great deal of work for the Bootle Corporation, the library and baths at Marsh-lane having been designed by him.

MR. QUARTERMAIN.—We have also to announce the death, on February 25, at his residence, Abingdon, in Dorset-road, Merton Park, Surrey, of Mr. Henry Goodall Quartermain, architect and surveyor, aged sixty-one years. Mr Quartermain was the son of a timber merchant and contractor in business at Oxford, and served his articles to J. G. Smither, of London. He was appointed as their architect and land surveyor by the Merton Park Estate Company for the laying out of, and the building of houses upon, their property at Merton. He also made the plans for the offices in Kingston-road of the Merton Parish Council (1902), the Rutlish Science School at Merton (1901), and of various residences, club-houses, etc., in the south-eastern counties.

The Student's Column.

ARCHES.—XII.

IN Rankine's works a considerable amount of attention is devoted to the discussion of the arch, but it is unfortunate that his theory is published in a somewhat inconvenient form for study and reference. In fact, it is only possible to obtain an intelligible idea of Rankine's views after carefully searching out and collating the information scattered through various chapters of his works. Even when this has been done, it will be found that much of his teaching is conveyed in mathematical forms difficult of practical application.

One of the most useful parts of his writings relating to the subject of arches is to be found in the investigation of the various curves assumed by a chain under different conditions of loading, and in the consideration of these curves, in an inverted position, as typical forms for arches under similarly distributed loading.

In "Civil Engineering," p. 202, it is pointed out that the principles of the catenary are applicable to linear arches by conceiving the chain to be exactly inverted so that the load applied to it shall act inwards instead of outwards, and by supposing, further, that the chain is in some manner stiffened so as to enable it to preserve its figure and to resist a thrust. The propositions and equations previously given by Rankine * for the curves of a chain apply equally to the corresponding curves of a linear arch.

The definitions contained in Article IV., p. 85, briefly describe some of the curves corresponding with those assumed by a chain under different distributions of loading; but, with the object of affording a consecutive record of Rankine's views, we will now refer to the various curves discussed by him in connexion with the masonry arch.

(1) When the load is vertical and distributed uniformly along a horizontal line the curve is a parabola. As reference to our previous articles will show, these conditions do not obtain in masonry arches.

(2) When the load is vertical and distributed uniformly along the curve the result is either a catenary or a transformed catenary. This condition would be represented by a catenary arch supporting a masonry spandrel wall of which the whole weight is assumed to be supported by the arch. We have already shown (Article VII., p. 171) that the loading cannot correctly be regarded as entirely vertical. Hence the conditions of loading here stated are only approximately applicable to masonry arches.

The variations of form of the catenary are defined in Article IV., pp. 85-86. Rankine's equations for these curves require the employment of Naperian or hyperbolic logarithms, and the determination of values by his formulæ is somewhat laborious.

(3) When the load is uniform and normal throughout, the curve is necessarily a circle. Rankine determines the external pressure or thrust by Navier's principle, which is as follows:—"The thrust at any normally pressed point of a linear arch is the product of the radius of curvature by the intensity of the pressure at that point, or, denoting the radius of curvature by r, the normal pressure per unit of length of intrados by p, and the thrust by T, we have $T = p\,r$."

Navier's principle is also employed by Rankine for determination of the horizontal pressure exerted upon a quadrant of the circle in a direction perpendicular to that of the load. In other words, this pressure represents the horizontal crown thrust, and the process of reasoning is as follows:—The uniform normal pressure p, if not actually caused by the thrust of a fluid, is similar to fluid pressure; and it is equivalent to a pair of conjugate pressures in any two directions at right angles to each other, of equal intensity. For example, let x be vertical.

* "Civil Engineering," pp. 185-202.

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y horizontal, and let p_x, p_y, be the intensities of the vertical and horizontal pressures respectively; then

$$p_x = p_y = p;$$

and the same is true for any pair of rectangular pressures; and if P be the total vertical pressure, and H the total horizontal pressure, exerted upon one quadrant A B of the circle, we have

$$H = P = T = pr.$$

(4) When the load gives rise to a pair of conjugate thrusts at each point uniform in amount and direction but not equal to each other, the resulting curve is an ellipse, which is a parallel projection of a circle. Rankine demonstrates that "the intensity of the pressure in the direction of a given diameter is directly as that diameter and inversely as the conjugate diameter," and further that "the intensities of a pair of conjugate pressures are to each other as the squares of the conjugate diameters of the elliptic rib to which they are respectively parallel."

In actual practice it is seldom the case that the conditions of loading are precisely identical with those giving rise to an equilibrium curve of elliptical form, the nearest approach being exemplified by a tunnel or culvert, built so far beneath the surface of the ground that the depth is great compared with the height of the arch.

(5) When the load causes normal pressure at each point proportional, like that of a liquid in repose, to the depth below a given horizontal plane, the curve is termed a hydrostatic arch (see Fig. 31, p. 86).

It will be seen by comparing Fig. 31, p. 86, with the right hand diagram in Fig. 29 on the same page that the hydrostatic arch differs from a true semi-ellipse by being of somewhat flatter curvature at the crown and springing, and of a somewhat sharper curvature at the haunches. The application of the hydrostatic arch in practice is founded on the fact that "every arch, after having been built, subsides at the crown, and spreads, or tends to spread, at the haunches, which, therefore, press horizontally against the filling of the spandrels"; from which it is inferred that, if an arch be built of a figure suited to equilibrium under fluid pressure, it will probably spread horizontally and compress the masonry of the spandrels until the horizontal pressure at each point becomes of equal intensity to the vertical pressure, and therefore sufficient to keep the arch in equilibrium.*

(6) When the load gives rise to pressure consisting in a vertical plane of a pair of conjugate pressures, one vertical and proportional to the depth below a given horizontal or sloping plane, and the other parallel to the horizontal or sloping plane, and bearing to the vertical pressure a certain constant ratio, the result is the geostatic arch. An arch in dry earth or sand is an example of this condition of loading.

The geostatic arch varies in form, and may approximate to the circle on one hand or to the ellipse on the other. The geostatic curve can be produced by transformation from the hydrostatic curve, by increasing or decreasing one set of the conjugate ordinates without altering the other set.

Following his discussion of the foregoing curves, Rankine considers † the general proposition that "a linear arch or rib of any figure under a vertical load distributed in any manner being given, it is always possible to determine a system of horizontal or sloping pressures, which, being applied to that rib, will keep it in equilibrium." These last are called the *conjugate pressures*.

The only case discussed in detail is that in which the conjugate pressures are horizontal, and the load is symmetrically distributed on each side of the crown of the arch. In connexion with this case the following problems are stated and methods of solution are given:—

Problem I.—To find the total horizontal pressure against the rib below a given joint.

Problem II.—To find the thrust at the crown of the rib.

Problem III.—To find the mean intensity of the horizontal pressure required in a given layer of the spandrel.

Problem IV.—To find the greatest horizontal thrust, the point of rupture, and the angle of rupture.

Problem V.—To find the position of the resultant of the maximum horizontal thrust.

Several examples are given of the last-mentioned problem relating to catenarian, circular, hydrostatic, and elliptic arches.

The discussion to which we have referred is followed by some remarks upon the "Stability of Blocks" and the "Transformation of Blockwork Structures."

So far it will be seen that, while many interesting principles are enunciated, some of purely speculative and all of mathematical character, very little, if any, attempt is made by Rankine to show in what manner these principles may be applied by the designer in everyday practice.

We must turn for further elucidation to a later chapter in the same work,* where much valuable information is given, although it is not arranged in a particularly consecutive or helpful manner.

In order to apply Rankine's principles to arch design it is necessary to ascertain the vertical and horizontal forces acting upon the proposed arch. The vertical force acting upon any part is assumed to be the weight of the masonry, earth, or other load vertically over the part in question; and the horizontal pressure to be that given by the equation in a previous chapter.†

As expressed by Rankine, this equation is not intelligible without reference to an accompanying diagram, but it may be thus stated:—

$$p_x = w\,d\,\frac{1 - \sin\Phi}{1 + \sin\Phi}$$

where p_x = the horizontal intensity at any point, w = the unit weight of the earth, d = the depth of earth over the point considered, and Φ = the angle of repose of the earth.

Using the same notation, the vertical intensity is

$$p_y = w\,d.$$

When the value and distribution of the vertical and horizontal forces have been determined, the equilibrium curve corresponding to the form of loading is adopted for the intrados of the proposed arch.

Rankine says that the exact form for the line of pressures on the sides and roof of a tunnel is the geostatic arch, and if the depth of the earth is great compared with the height of the buried archway, the proper form for the line of pressures is the elliptic linear rib. The intrados will then be an ellipse in which

$$\frac{\text{horizontal semi-axis}}{\text{vertical semi-axis}} = \sqrt{\frac{p_y}{p_x}} = \sqrt{\frac{1 - \sin\Phi}{1 + \sin\Phi}}$$

"If the earth is firm and little liable to be disturbed, the proportions of the half span or horizontal semi-axis to the rise or vertical semi-axis may be made greater than is given by the preceding equation, and the earth will still resist the additional horizontal thrust; but that proportion should never be made less than the value given by the equation, or the sides of the archway will be in danger of being forced inwards." ‡

Considering the relation between the linear rib and the intrados of a real arch, Rankine points out § that there are numerous cases in which the form of a linear rib suited to sustain a given load may at once be adopted for the intrados of a real arch for sustaining the same load with sufficient exactness for practical purposes. The following test may be applied to ascertain whether this method is applicable to any given case.

Let A C B, Fig. 57, be one half of the ideal rib which it is proposed to adopt as the intrados of a real arch. Draw A a normal to the rib at the crown so as to represent a length not exceeding two-thirds of the intended depth of the keystone, and conceive a couple applied to the keystone consisting of tension at A equal and opposite to the thrust along the rib there, and of an equal thrust at a.

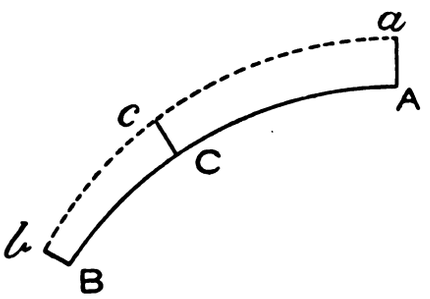

Fig 57.

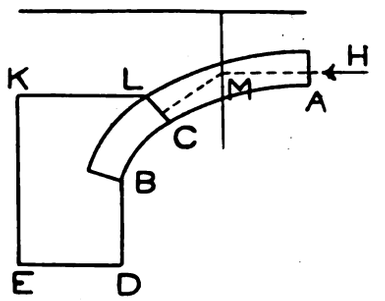

Fig. 58.

Draw a normal B b at the springing and make

$$\frac{\text{B } b}{\text{A } a} = \frac{\text{thrust along rib at A}}{\text{thrust along rib at B}},$$

and conceive a couple of equal moment to the first, consisting of tension at B and thrust at b to be applied at the springing. The pair of couples thus introduced do not alter the equilibrium, their only effect being to transfer the line of pressures from the intrados or ideal rib A C B to a line $a\,c\,b$ whose perpendicular distance C c from the intrados at any point is inversely as the thrust along the rib at that point. Then if $a\,c\,b$ lies within the middle third of the arch ring the ideal rib A C B is of a suitable form for the intrados.

The method adopted by Rankine for determining the stability of any proposed arch is as follows:—

The first step is to assume a linear arch, parallel to the intrados of the proposed arch and loaded vertically with the same weight distributed in the same manner. The assumed linear arch is then to be treated according to the method, discussed in "Civil Engineering," p. 213, to which reference has been made above.

Then by the equation given for the solution of Problem III.,* determine either a general expression, or a series of values, of the intensity p_y of the conjugate pressure, horizontal or oblique as the case may be, required to keep the arch in equilibrium under the given vertical load. If that pressure is nowhere negative, a curve similar to the assumed arch, drawn through the middle of the arch ring, will be exactly or very nearly the line of pressures of the proposed arch; p_y will represent exactly or very nearly the intensity of the lateral pressure which the real arch will exert at each point against its spandrel and abutments; and the thrust along the linear arch at each point will be the thrust of the real arch at the corresponding joint.

On the other hand, if p_y has some negative values for the assumed linear arch, there must be a pair of points in that arch where that quantity changes from positive to negative and is equal to nothing. The angle of rupture at that point is to be determined by solving Problem IV. The corresponding joints in the real arch are the joints of rupture, and below them conjugate pressure from without is required to sustain the arch, and, consequently, the backing must be built with squared side joints.

In Fig. 58 let B C A represent one half of a symmetrical arch, K L D E an abutment, and C the joint of rupture found by the method described. The point of rupture, which is the centre of resistance of the joint of rupture, is somewhere within the middle third of the depth of that joint; and from that point down to the springing joint B the line of pressures is a curve similar to the assumed linear arch and parallel to the intrados, being kept in equilibrium by the lateral pressure between the arch and its spandrel and abutment.

From the joint of rupture C to the crown A the figure of the true line of pressures is determined by the condition that it shall be a linear arch balanced under vertical forces only; that is to say, the horizontal component of the thrust along it at each point is a constant quantity, and equal to the horizontal component of the thrust along the arch at the joint of rupture. That horizontal thrust is to be found in solving Problem IV., mentioned above.

The only point in the line of pressures above the joints of rupture which it is important to determine is that at the crown of the arch A; and it is found in the following manner:—

Find the centre of gravity of the load between

* "Civil Engineering," p. 419. † *Ibid.* pp. 213-218.

* "Civil Engineering," pp. 413-436. † *Ibid.* p. 320. ‡ *Ibid.* p. 434. § *Ibid.* p. 417.

* $p_y = -\frac{d\,H}{d\,x} = -\frac{d}{d\,x}\left(P\,\frac{d\,y}{d\,x}\right)$.

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the joint of rupture C and the crown A, and draw through that centre of gravity a vertical line. Then, if it be possible, from one point, such as M, in that vertical line to draw a pair of lines, one parallel to a tangent to the soffit at the joint of rupture and the other parallel to a tangent to the soffit of the crown, so that the form of those lines shall cut the joint of rupture, and the latter the keystone in a pair of points which are both within the middle third of the depth of the arch ring, the stability of the arch will be secured; and if the first point be the point of rupture, the second will be the centre of resistance at the crown of the arch and the crown of the true line of pressures.

When the pair of points related to each other as above do not fall at opposite limits of the middle third of the arch ring, their exact positions are to a small extent uncertain, but that uncertainty is of no consequence in practice. Their most probable positions are equidistant from the middle line of the arch ring.

Should the pair of points fall beyond the middle third of the arch ring, the depth of the arch stones must be increased.

GENERAL BUILDING NEWS.

CHURCH, GRIMETHORPE, YORKSHIRE. — A new church, built on the slope rising from the Valley of the Dearne at Grimethorpe—a couple of miles south-east of Cudworth, and half a dozen miles from Barnsley—was consecrated on the 10th inst. The edifice is a building of brick and stone, with red roof and turret. The architect is Mr. Hodgson Fowler, of Durham.

BANKING PREMISES, YORK.—Alterations for Messrs. Barclay and Co. are being carried out at the corner of High Ousegate, Parliament-street. When the new premises are ready for occupation they will have a frontage of nearly 100 ft. to Parliament-street, with the main entrance in High Ousegate. Ruabon red pressed bricks are used for the most part, with Closeburn red stone and a plinth of granite. When the whole of the work is finished there will be a banking hall about 50 ft. by 40 ft., and the premises will be 56 ft. high from the flags to the coping. The bank and offices will be lighted throughout by electricity. Mr. Edmund Kirby, of Liverpool, is the architect, and Mr. T. P. Barry, of York, contractor.

CHURCH OF ST. PAUL, FAIRHAVEN.—Messrs. R. L. Lowe, Farnworth, ask us to mention that this church, the opening of which was recorded in our last issue, is laid with their patent wood-block flooring.

WESLEYAN CHURCH, SEVENOAKS. — The new Wesleyan Church at Sevenoaks, which has just been opened, has been built at a cost, including site and furnishing, of 7,000*l.* The church is situated on the summit of the Drive, overlooking the Holmesdale Valley. The building—cruciform in plan, with end gallery—is in the Early English style, freely treated. It has a tower and spire rising to a height of about 80 ft., faced with Kentish ragstone and Bath stone dressings. The church is capable of accommodating nearly 600 persons. Vestries are provided in the rear, with a church parlour, etc., for social purposes. The warming is on the low-pressure hot-water system. The plans were prepared by Mr. James Weir, architect, of Westminster, and the contractors were Messrs. Wm. Johnson and Co., Ltd., of Wandsworth Common.

WESLEYAN CHURCH, OKEHAMPTON.—The new Wesleyan Methodist Church and Sunday School at Okehampton were opened on the 1st inst. The church is situate in Fairview-place, and is of Gothic design. The seating accommodation is for 400. The school premises, including a large assembly hall and four class-rooms opening into it, are in the rear. Messrs. John Wills and Son, Derby, were the architects, and Mr. Henry Geen, Okehampton, the builder.

SCHOOL, NORTH HEATON. — The new public elementary school at Tosson-terrace, North Heaton, Newcastle, was opened on the 3rd inst. The school, which comprises three departments — boys, girls, and infants — provides accommodation for 1,330 children. The architect is Mr. S. D. Robins, of Newcastle and Sunderland; the contractor, Mr. Thomas Lumsden, of Jarrow; the hot-water engineers, Messrs. Dinning and Cooke; and the clerk of works, Mr. John S. Graham. The mixed school is of brick, with stone dressings, and the roof is slated with green American slates. The ground and first floor each contain a central hall 73 ft. by 31 ft., and seven class rooms, with accommodation for 476 scholars on each floor. Both floors to the central halls are in maple. Two cloak rooms and lavatories are provided to each school on each floor. The first floor is approached by a staircase at either end, the steps being Robinson's patent, supplied by the Metallic Paving and Artificial Stone Co., London. The cloak rooms and passages are lined with white glazed bricks, and finished with a patent moulded tile. Four masters' and mistresses' rooms are provided on a mezzanine floor. The infants' school is a one-story building, and contains on the ground floor a central hall 63 ft. 8 in. by 24 ft., and seven class rooms, with accommodation for 410 infants, also two mistresses' rooms and the necessary cloak room and lavatory accommodation. The whole school is heated by hot water. The plumbers are Messrs. W. Scott and Sons, of Newcastle and Jarrow; plasterer, Mr. Mitchell, of Shields and Jarrow; slater, Mr. Charles Nicholson, of Newcastle; painter and glazier, Mr. John Dixon, of Jarrow. Hardware has been supplied by Messrs Emley and Sons: the iron railing and gates by Messrs. Swinney, of Morpeth. The sanitary fittings have been supplied by Messrs. Adams, of Scotswood, and Messrs. Twyford. Gas fittings have been supplied by Messrs. Scott and Sons.

GOOD TEMPLARS' HALL, ARBROATH.—The new Good Templars' Hall, which is being erected at the corner of Reform-street and Hume-street, Arbroath, is now nearing completion. The new building consists of one hall, 58 ft. by 37 ft., seated for about 550 persons, and a lodge-room 33 ft. by 22ft. 6 in., with three ante-rooms. The architects are Messrs. Carver and Symon, under whose supervision the work has been carried out by the following contractors: Builders, Calder Brothers; joiner, R. C. Farquhar; plumber, George Rayne; slater, John Mitchell and Son; plasterers, Middleton and Donald; heating, T. R. Grant; glazier, D. J. Scott; painter, E. W. Mathewson; and the furniture has been supplied by the Bennet Furnishing Co., of Glasgow. The total cost of the work, including architects' fees, will be 1,400*l.*

BANK, DUNDEE.—A new branch Savings Bank is now in course of erection in the Hilltown district of Dundee. It is situated at the corner of Hilltown and Stirling street. The Bank offices form the main part of the building. They are situated on the ground floor, and measure 43 ft. by 30 ft. inside, including a strong room and a private room. In the basement are placed the heating chamber and the lavatory accommodation. Above the Bank there are two houses, one for the manager and the other for the caretaker. Messrs. Johnston and Baxter are the architects, and the various contractors are as follows:—Masons, A. and T. Craig; joiners, Charles Smith and Son; plumber, David Bremner; plasterer, James Laburn; slaters, Alexander and Thomson. Mr. P. C. Barron is clerk of works.

HOUSE-BUILDING IN LIVERPOOL. — The Liverpool City Building Surveyor, Mr. Goldstraw, has completed his annual report of the work of his department during the past year. Eight complete years have now elapsed since the extension of the city in 1895, and the new houses erected in each of the intervening years numbered as follows:—1895, 247; 1896, 1,199; 1897, 1,656; 1898, 1,977; 1899, 2,358; 1900, 1,573; 1901, 1,963; 1902, 2,061; and 1903, 2,453. It would thus be seen that the figures for the past year were 626 above the average of the previous seven years, showing an increase of 392 over those for the year 1902, and reaching the highest record of the eight years. The growth of the city might be observed from the new houses built in the separate divisions, which were indicated by the following figures:—Wavertree, 641; West Derby, 471; Walton, 432; Old City, 405 (including 263 labourers' dwellings erected by the Corporation); Garston, 299; Toxteth-park, 205. An extended comparison, however, comprising the last nine years, showed that the whole rate of growth had been much greater in Wavertree than in any other district. The entire number of houses built in the last nine years was 15,795. But 555 of these were built in the year 1895, before the extension of the city boundaries at the end of that year. Also 299 houses of the above total were built last year in the Garston district, since the later extension of the boundaries. To ascertain the relative growth of the city, year by year, only the figures for the years 1896 to 1902 inclusive, should be compared; and it might be noted that the houses built in these seven years between the two extensions of the city amounted to 12,787, whilst the number built in the eight years since the extension of 1895 amounted to 15,240. Taking all the houses (2,453) erected last year, the following were the percentages of rentals:—Houses of rental under 12*l.*, 8·2 per cent.; from 12*l.* to 18*l.*, 14·8 per cent.; from 18*l.* to 25*l.*, 43·1 per cent.; from 25*l.* to 35*l.*, 23·8; and from 35*l.* upwards, 5·1. The work of inspecting and dealing with dangerous buildings has been much heavier during 1903 than it had been for some time past, the number of notices in such cases for the past year having reached the high figure of 3,007. The number of summonses also showed a corresponding increase, while there was a considerable falling off in the number of "Contrary to regulation" notices. This seemed to be an indication that the steady enforcement of the building regulations had educated the ordinary builders up to a higher standard of construction and materials.

EXTENSION OF SHEFFIELD TOWN HALL.—The Improvement Committee of Sheffield City Council have considered plans and drawings prepared by Mr. E. W. Mountford, architect, for the proposed extension of the Town Hall, and an approximate estimate of the cost of such extension and other alterations to the present building, including the provision of cellerage for storage purposes, also of an electric passenger lift, urinal, and the execution of certain other work to make available parts of the present building at present inaccessible, amounting to 36,000*l.*, exclusive of architect's commission, clerk of work's salary, furnishing, and cost of land, and the plans and drawings were ordered to be exhibited in the Council Chamber at the meeting of the Council.

MASONIC HALL, BROUGHSHANE, NEAR BELFAST. —The foundation-stone has just been laid of the new premises for the Broughshane Masonic Lodge 246. The architect of the new hall is Mr. Andrew Boyd, C.E., Ballymena. The new hall, the façade of which will be next the village street, will be 52 ft. by 23 ft., with an entrance on the ground floor. Besides a caretaker's residence there will be a store-room and some other apartments, and the lodge-room above will be 30 ft. by 20 ft. Adjoining this will be a refreshment-room.

PROPOSED NEW INFIRMARY AT SHOREHAM. — The Steyning Guardians had a proposal from the Works Committee before them at their meeting at Shoreham recently in regard to the erection of a new Infirmary at Shoreham Workhouse. Some of the details are:—Four infirmary pavilions of two floors, providing for sixty beds, 20,000*l.*; maternity ward, with beds for eight women, 2,000*l.*; nurses' home, with accommodation for thirty-two nurses, 5,500*l.*; small isolation hospital, 1,200*l.*; surgical block, including the dispensary and waiting-room, the operating-room, surgery and accessories, 1,200*l.*; walls, roads, etc., 1,200*l.*; padded rooms, 600*l.*; mortuary and post-mortem rooms, 250*l.* Other buildings on the Workhouse grounds also planned are the extension of tramp wards and married couples' quarters, with two rooms each for four couples. These will cost 60*l.* Mr. Singleton, Chairman of the Committee, said that the architect, Mr. Clayton had prepared plans, and these were submitted to the Local Government Board, whose official suggested a number of improvements in the scheme.—An amendment was proposed by Mr. J. Turton:—"That the rough estimate of the new Infirmary scheme, excluding the extension of tramp wards and married couples' quarters, be approved and referred back to the Works Committee with the request that they should consider the extent of the accommodation required for immediate purposes, both for patients and nurses, and report thereon to the Board at an early date."—The amendment was carried, with the approval of the Committee.

TRAMWAYS OFFICE, DERBY.—A new tramways office is being erected in Victoria-street, Derby. The building is of pressed bricks, with Hollington stone dressings, tiled roof, and mullioned windows. There is a dome on the top, of copper. On the ground floor is a waiting-room, and connected with this there is a retiring-room for ladies. There is a receiving office, where the conductors of cars will deliver the contents of their boxes, and a mess-room for the men to have their meals in. On this floor is a gentlemen's lavatory. There is a stone staircase at the Corn-market end of the building leading up to the committee-room, general manager's office, etc. Above are offices of similar size, and on the top floor are a suite of rooms for the use of the caretaker, etc. A lift from the basement to the upper rooms is provided, and the heating of the offices is carried out by means of radiators. Electric light is introduced into every room, and all the floors are fireproof. The architect is Mr. A. Macpherson, and the contractors for the work are Messrs Ford and Co.

ENLARGEMENT OF THE BUCKS COUNTY LUNATIC ASYLUM, STONE.—The new wings and other additions to the Bucks County Lunatic Asylum at Stone were opened recently. The Asylum has been enlarged so as to accommodate 115 female and 111 male patients, and 21 attendants. The additional accommodation for patients is provided by wings on either side of the existing building, heated by hot-water pipes and radiators, and ventilated by gratings opening into shafts connected with extractors on roof; the fresh air being admitted into rooms through radiators. The administrative block has been enlarged by the erection of a new bakehouse, the old bakehouse being annexed to the kitchen. Quarters for assistant medical officer and a surgery, and rooms for

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kitchen staff, have also been added. The Recreation Hall has been enlarged, and is provided with a fitted-up stage and dressing-rooms. The chapel has been enlarged to accommodate 414 patients; the laundry has been added to and re-modelled, and a boiler-house, with an 80 ft. chimney shaft, has been erected. There is a water tower, containing two tanks of a capacity of 20,000 gallons, on land belonging to the County Council, adjoining their water supply at Willow Spring. New fire mains and hydrants have been provided in and outside the buildings. A new mortuary has been erected, and houses for the clerk and steward and engineer. The telephone has been laid on throughout the premises, as well as electrical tell-tales. The contracts entered into were:—General buildings, Messrs. W. Pattinson and Sons, Ruskington, Sleaford, 49,415*l.*; electric lighting, Messrs. Lea and Warren, Kettering, 5,053*l.*; telephones and tell-tales, Messrs. W. J. Furse and Co., Nottingham, 340*l.* 18s. The sub-contractors employed through Messrs. Pattinson included:—Laundry machinery, Messrs. Tullis and Co., Glasgow; steam boilers, Messrs. Yates and Thom, Blackburn; heating, Messrs. Duffield and Sons, Slough; water tanks, Messrs. Clayton, Sons, and Co., Hunslet; fire mains and hydrants, Messrs. Shand, Mason, and Co., London; padded-rooms, Messrs. Pocock Bros., London; steam oven, Mr. A. Hunt, Leicester; ventilation, Messrs. Kite and Co., London; boiler-house tanks, Messrs. R. and J. Dempster, Manchester; lightning conductors, Messrs. J. and W. Gray, London; locks, Mr. Gibbons, Wolverhampton; sanitary fittings, Messrs. Doulton and Co., Lambeth; plumbing, Messrs. H. Braithwaite and Co., Leeds; painting, Messrs Simms and Son, Leicester; wood block flooring, Messrs. Roger Lowe and Co., Farnworth; proscenium and stage fittings, Messrs De Jong and Mr. Julian Hicks, London. Mr. C. H. Riley was clerk of works for the undertaking. Mr. G. H. Blatherwick, Nottingham, was the quantity surveyor. Mr. Campbell-Swinton was the electrical engineer, Mr. Pierce representing him. The works were designed and directed by Mr. R. J. Thomas, the County Surveyor.

THE "POTTER" DWELLINGS, LIMEHOUSE.—These dwellings, which were opened last week, are erected on a portion of an area cleared pursuant to the provisions of the London (King John's Court, Limehouse) Improvement Scheme, 1897. The scheme provided for the erection on the cleared area of working-class dwellings for the accommodation of fifty-six persons; for the widening of Limehouse-causeway, from Three Colt-street to Gill-street, to a minimum width of 30 ft.; for the widening of Three Colt-street, opposite Nos. 109 to 117, to a width of 30 ft.; and for the stopping up and inclusion in the improvement area of King John's-court. Further provisions were contained for the erection of the dwellings by the local authority, unless, within one year from the time of the clearing of the area, such dwellings had been previously erected, and it was also provided that all lands on which dwellings were erected under the scheme, should be appropriated for the purpose of dwellings for the period of twenty-five years from the date of the erection. The dwellings were designed by the Borough Engineer (Mr. M. W. Jameson), and on April 15, 1903, the Council accepted the tender of Mr. A. E. Symes, of Stratford, whose price was 6,283*l.* The dwellings consist of two blocks of buildings, three stories high, one facing Limehouse-causeway, containing twelve two-roomed and three three-roomed tenements; and the other, facing Three Colt-street, containing three two-roomed and nine three-roomed tenements. The two-roomed tenements each contain a living-room, bed-room, scullery, and water-closet, and are to be let at a weekly rental of 7s.; and the three-roomed tenements, each containing a living-room, two bed-rooms, scullery, and water-closet, are to be let at 8s. 6d. weekly. Each tenement is self-contained and provided with a scullery containing copper, coal-box, sink, and draining-board. The walls are constructed of brickwork, and the partitions and floors of concrete, so that, with the exception of the roof and top floor ceiling, the buildings are fireproof. The vacant land at the end of the site facing Limehouse-causeway will be fenced round with a suitable wrought-iron railing and planted as a shrubbery.

NEW TOWN HALL, DARVEL, N.B.—A new town hall is to be erected on a site in Main-street, Darvel. The new building will have two halls, the main hall providing accommodation for 800 to 1,000 people, and the lesser hall for 200. Mr. T. H. Smith, of London, is the architect. The cost will be between 3,000*l.* and 4,000*l.*

MUNICIPAL DWELLINGS, MARYLEBONE.—The foundation-stone of the new municipal dwellings in John-street, Edgware-road, has just been laid. The site of the new buildings forms a parallelogram. It has a frontage of 107 ft. and a depth of 89 ft. At the back a courtyard has been left with an area of 4,986 ft., which will be used as a playground by the children of the tenants. The building will be seven stories in height, and will contain on the lower floors eighteen single-room tenements for old people. The five upper floors will contain two-room and three-room tenements, there being ninety-six rooms altogether. The building, which will be constructed of fire-resisting material, has been designed by Mr. H. B. Measures, and will be erected by Messrs. J. Chessum and Sons.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, LANCASTER.—A stained glass memorial window in memory of Colonel J. M. Gawne, who fell in the South African War, is to be erected in the new King's Own Memorial Chapel in the Parish Church, Lancaster. The new window will be placed in the apse, and will have for its subject the figures of King Alfred and St. Oswald, with the arms of the Gawne family and Manxland underneath. Messrs. Shrigley and Hunt, Lancaster, are the artists for the work.

APPOINTMENTS.

SCHOOL BUILDINGS SURVEYOR, SURREY COUNTY COUNCIL.—Mr P. P. Story, chief engineering assistant in the offices of the City Surveyor of Manchester, has been appointed by the Education Committee of the Surrey County Council as their Surveyor of School Buildings.

SANITARY AND ENGINEERING NEWS.

THE SUBWAY SYSTEM FOR UNDERGROUND WORKS, FALKIRK.—The Falkirk Town Council have just completed a scheme of improvement by cutting a new street through an old and narrow lane known as Lintriggs, and thus connecting the two principal thoroughfares of the town—High-street and Newmarket-street—and joining the latter street almost opposite the Municipal Buildings. The new street is 40 ft. wide. As the main pipes would necessarily come down through the new thoroughfare, it was considered a suitable opportunity for introducing a new method of accommodating these in a brick conduit measuring 6 ft. in height and 4 ft. in width. In this the main water and gas pipes, as well as the electric light and telephone cables, are placed. Between the main conduit and the properties on either side branch conduits have been laid, so as to admit of drawing in water and gas pipes, electric light, and telephone wires to the new properties. The house drainage is brought from the houses to manholes built in the footpaths, and these again are connected to the main sewer, which, for obvious reasons, is not placed in the main conduit. The latter is provided with openings at either end for access for taking down material and making repairs. The coverings of these manholes are open gratings, which admit of ample ventilation. This is the first time in Scotland that the subway system of accommodating underground works has been adopted. The work has been designed and carried through by Mr. David Ronald, C.E., Burgh Engineer.—*Scotsman.*

FOREIGN.

FRANCE.—M. Carolus-Duran was on Saturday last duly elected a member of the Académie des Beaux-Arts in place of Gérôme, by twenty out of thirty-six votes. The new Academician was born at Lille in 1837, and was sent to Rome as a "pensionnaire" of the "Société des Sciences et Arts" of Lille. He was afterwards, at Paris, the pupil of Souchon. He subsequently visited Spain to study the works of "Velasquez, and on his return to France commenced the series of portraits which have established his reputation. Among the number may be specially named the "Femme au Gant," now in the Luxembourg; the portrait of Madame Croizette by the sea side, and those of Madame Vandal and of Emile de Girardin. He is the author also of a very dramatic picture, "L'Assassiné," which is in the museum at Lille; several good landscapes, an "Entombment," and a ceiling in the Louvre, "Gloria Mariæ Medici." M. Carolus-Duran is a Grand Officier of the Legion of Honour, and, in 1879, obtained the "médaille d'honneur" of the Salon.——This year twenty students have been admitted to the competition for the Prix de Rome in Architecture, instead of the usual ten. The subject is "A barracks for an infantry regiment."——M. Bassompierre-Sewrin has obtained the first prize in the competition opened by the Union Céramique et Chaufournière, of which he has been appointed architect.——A new iron railway bridge is to be erected over the Aisne, at Guignicourt.——M. Mercié has finished the model of the group to be placed in the Panthéon as a monument to the principal generals of the Revolution. He has received the commission to produce a second group commemorating the great orators of the Restoration, which was originally to have been executed by Dalou and Chapu.——The French Government are about to acquire, at a price of 3,790,000 francs, the Farnese Palace, in order to make use of it as the French Embassy.——We have to record the death of M. Gion, Honorary Architect of the City of Paris. He was a pupil of Questel, of Gilbert, and of Diet. Among his principal works are the churches of St. Parvis and of St. Waast, and various schools in Paris. He exhibited at the Salon, in 1866, a design for a church for Rambouillet, and executed important works of restoration for the Commission des Monuments Historiques, especially the tower of the cathedral at Pierrefonds and the ancient Abbey of Ourscamp. M. Gion was brother-in-law of Mr. Daumet, the well-known architect.——The death is also announced, at the age of 47, of the sculptor Felix Soulès, a former pupil of Jouffroy and of Falguière. He was author of various works of some importance — "L'Enlèvement d'Iphigénie," "Satyre et Bacchante," "Joueuse de boules," and the portrait statue of General Lamarque. M. Soulès was Chevalier of the Legion of Honour.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Frank S. Mayo, 11, Queen Victoria-street, E.C., has been appointed Sole London Agent for Messrs. Gibbs Brothers, Loughborough, for the sale of their red sand-faced and moulded bricks and concrete paving.

TRAMWAYS AND LIGHT RAILWAYS ASSOCIATION.—The annual dinner of this Association will take place in the Picture Galleries, Prince's Restaurant, Piccadilly, at 7.30 for 8.0 p.m. on Wednesday, April 13. The chair will be taken by the President of the Association.

THE FATAL FIRE IN THE CITY.—Dr. Waldo, the Coroner for the City of London, has sent us the verbatim report of his remarks to the jury at the inquest, which was briefly reported in our last. The Coroner, in summing up, said that safeguard against fire in administrative London was provided for under two Acts of Parliament—namely, the London Building Act of 1894 and the Factory and Workshop Act of 1878. Under the London Building Act protection against fire was insisted on by the London County Council only in houses where the height from the street level to the floor of the topmost story measured over 60 ft. This Act was not retrospective, and only applied to houses built since 1894. The jury would doubtless recognise, therefore, that the Act was an imperfect measure, since no provision was made as regards structural safeguards against fire in houses more than ten years old. In the City, with its narrow streets, courts, and alleys, an Act was especially needed which would apply to all buildings, no matter what their height or age, the purpose for which they were used, or whether they did or did not possess parapets. With regard to the Factory and Workshop Act, the London County Council insisted on certain safeguards against fire in such factories and workshops only where more than forty persons were employed. At the same time, it was true that by the Amending Act of 1901 (section 15) the Council were empowered to make by-laws providing for means of escape from fire in "any" factory or workshop, irrespective of the number of persons employed, or, in other words, where a less number than forty were employed. It appeared, however, in evidence that no safeguard against fire had been suggested, or existed, in the case of the workshop employing eleven girls which faced the seat of the fire in Duke's Head-passage. Such new clause appeared, therefore, up to the present time at least, to be a dead letter. The Coroner further said that, with the object of learning more about fires and their topography, he had personally visited on the spot the sites of some 150 City fires reported to him under the provisions of the City of London Fire Inquests Act during the year 1903. As a result of the experience thus gained he could with the greater confidence suggest what he had already suggested nearly two years ago on the occasion of the lamentable fire in Queen Victoria-street when ten young lives were lost. He (the Coroner) would now repeat, in the same words, what he had then given voice to—namely, 'A way in which the jury might help to bring about desirable changes would be to advise the City to obtain powers of regulating all buildings within the City under a special Act. In that way the City of London would be following its ancient traditions in protecting the safety

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of citizens.' He (the Coroner) considered that the City should lead the way, make its own reasonable by-laws enforcing the provision of structural safeguards against fire in the City, and appoint its own inspectors. By so doing the City would, as it had already done with its special Fire Inquests Act, be setting an example to the rest of England and Wales.

COUNTY ASYLUM, COLNEY HATCH.—The new permanent buildings, for which the plans and designs are being prepared by the Asylum Engineer, at an estimated cost of from 60,000*l.* to 70,000*l.*, will provide for 310 patients, with staff, distributed over seven blocks. The old buildings were erected for the Justices of the Peace for the County of Middlesex in 1849-51 by Myers, contractor, after plans and designs by S. W. Daukes, who gained the first premium of 300*l.* in the competition; the second premium of 200*l.* was awarded to the designs, after the Tudor style, submitted by George Godwin and Harris as joint architects. Our journal of July 5, 1851, contains a bird's-eye view, and a plan of the principal floor of the Asylum as first built after Daukes's plans, which covered 4½ acres of the site. Extensive additions have been made since.

THE INSTITUTE OF ARCHITECTS AND L.C.C. DRAINAGE BY-LAWS.—The Metropolitan local governing authorities are in receipt of a circular letter from the Secretary of the Royal Institute of British Architects, stating that his council have had their attention drawn to the great cost and trouble involved in complying with the requirements of the London County Council drainage by-laws made in accordance with the provisions of the Metropolis Management Acts Amendment (By-laws) Act, 1899, in connexion with any but the smallest buildings, and that it appeared to be the case that, before a "person" is able to get sanitary work approved by a sanitary authority, he must submit duplicate plans showing "every floor of any building in connexion with which such pipes and drains are to be used, and the position, form, levels, and arrangements of the several parts of such building, including the roof thereof, and the size and position of every drain, manhole, gully, soil pipe, waste pipe, ventilating pipe, and rain-water pipe, and of any drain passing under such building, and the position of every bath, water-closet apparatus, slop-sink, urinal, lavatory-basin or apparatus, sink (not being a slop-sink), and trap in connexion with the foregoing" (clause 2), and also "shall show the positions of all windows and other openings into the building, and the height and position of all chimneys belonging to the building within a distance of 20 ft. from the open end of the soil pipe and ventilating pipe" (clause 3), and also submit a block plan showing the properties and streets adjoining. The Secretary goes on to state that his council are of opinion that this imposes a very onerous and unnecessary tax on either the owner, or the architect, or the contractor of a building in London, and that the expense becomes infinitely greater where a large existing building is having a new system of drainage constructed if By-law No. 2 is interpreted by the sanitary authority to mean that "necessary" plans are all the plans required by No. 1, as this would mean the measuring up of the whole of the old buildings and the preparations of complete sets of drawings for no other purpose than this sanitary requirement, as such drawings are not required for the carrying out of the works themselves. It is also noted that By-law 1, section No. 4, requires a complete specification of all sanitary and other matters, and, the letter urges, that if it be the intention of the authorities to add such an expense to the ever-increasing cost of building or drainage operations, which is always pressing heavily upon building owners, it will tend, in the case of old buildings, to induce the owners to postpone as long as possible the redraining of their premises. The Council of the Royal Institute submit that a block plan, as required by section 5, with the levels and gradients properly worked on, would show everything that is necessary, as this would give in effect the longitudinal sections of the drains, and that beyond such plan, a written description of the pipes and apparatus below and above ground, such as is necessary to enable a contractor to carry out the work, would be reasonable. In conclusion a hope is expressed that the Local Government Board, in conjunction with the London County Council and other authorities will see their way, in the interests of the building public, to modify the by-laws in the direction suggested.

SHEFFIELD ART CRAFTS GUILD.—A meeting of the members of the Sheffield Art Crafts Guild has just been held at the Building Trades Exchange, Cross Burgess-street, Sheffield, when a paper on leadwork was read by Mr. Hadfield. The Master, Mr. T. Swaffield Brown, presided. The paper was illustrated by lantern slides, showing old examples of the plumbers' craft in England and the Continent, and of ornamental plumbing works executed in Sheffield and elsewhere on buildings designed by the author during the past thirty-five years, most of them by Sheffield craftsmen. Mr. Hadfield congratulated the Guild on the compliment paid to their work in this city by Mr. C. H. Townsend when recently distributing prizes to the students of the Corporation Technical School of Arts. He was in entire sympathy with the sound and practical advice to the craftsmen which permeated the whole address. Mr. Townsend had urged the desirability of the designer and worker meeting now and again in friendly intercourse to discuss their common difficulties, and then arrive at solutions that met the claims of both. Mr Hadfield thought that art education in this country had hitherto failed to equip the craftsman equally with his French, German, or Italian comrade, and undoubtedly not with the marvellously-skilled craftsmen of the Middle Ages. It tended to stifle originality, and to lead him to lean too much on precedent. Allusion was made by the lecturer to the neglect of old building traditions by architects and others during the past century, which had resulted in the decadence of the lead-worker's "art and mystery." There were signs, however, that, with the opening of the new century, there would be a revival. The special qualifications of lead for building purposes were considered, and it was shown to be capable of artistic treatment, and to be suitable both for decorative purposes, as well as constructive. The process of manufacturing cast-lead sheets, now coming again into use, was described, and also allusion made to the great use of lead for roofing both in England and abroad from Anglo-Saxon times downwards. Mr. Hadfield read some interesting extracts from the fabric roll of York Minster, where the rates of wages, mode of carrying on the plumbing work, forms of contract with master plumbers in the XIVth and XVth centuries were minutely described. It was pointed out that the use of lead for rain-water piping and spouting in important buildings was true economy and in the interest of property owners in the long run. He expressed regret at the practice by house painters of painting external lead work. It was unnecessary and wasteful, and it was a source of disfigurement. Lead was an English metal, and preferable to other metals owing to its weather-resisting properties, and had been extensively used for statues and monumental vases in the old English garden. Such pieces of artistic craftsmanship in lead were now highly valued. Lead bore climatic influences better than bronze. It was also suitable for marble inlay, forming an imperishable material for monumental and pavement slabs, capable of highly artistic treatment.—*Sheffield Independent.*

BUILDING BY-LAWS, CARDIFF.—Attention was called by Mr. Roberts at a meeting of the Cardiff Council a few days ago to a report presented by the Borough Engineer on the building by-laws. Mr. Harpur stated that the builder was not required to serve notice for the inspection of any part of the work before covering the same up except the foundations and drains. He might, if he chose, leave the concreting or the site to any convenient time, and he might then lay down the concrete and place the floor upon it immediately without giving notice. It was stated that the by-laws of the Corporation had sent up the price of property 25 per cent., and people were prepared to pay the increased price, because they believed they were getting better-built houses than formerly. It was true that the inspector, if he found any work covered up so that he could not inspect it, could call upon the builder to cut into, open out, or lay bare the work sufficiently to enable him to satisfy himself of its condition, but Mr. Roberts questioned whether this was always done. He pointed out that in the year 1897-8 1,258 houses and shops were built, but the number went down to 185 in 1901-2, and rose again to 398 in 1902-3. There were six inspectors, and if they could do the work between 1892 and 1898, surely there were too many employed at the present time. If the work was well done he would not complain, but he knew it was not well done. He referred to a case where the floor was put down before the houses were built.—Alderman Mildon could not credit the last statement. If it were so, let them have the name of the builder.—Mr. Chappell said he knew of a case where the floors were put down before the walls of the houses were 2 ft. high.—Alderman Mildon: If there is such a case let us have the name. I cannot believe it.—Mr. Chappell said he would not give the name now, but when another case arose he intended to make a scene, builder or no builder. He was not going to be told he was not to be believed.—Mr. Roberts moved an amendment to the report, but the Mayor informed him that he was out of order. Mr. Harpur had reported upon the power of the Corporation under the by-laws, and the by-laws could not be altered.—Mr. Harpur: The by-laws were framed on the Local Government Board model, and you will not get them altered—Alderman Beavan: It took us twenty-five years to get them.—Mr. Veall moved an amendment, but that was also ruled out of order, and the minutes of the Public Works Committee were approved.—*Western Mail.*

PATENT SPRING CLEANING.—At a time of year when householders are confronted with the horrors of spring cleaning, the case of Dunn *v.* Holt will be read with interest. The appellant was in the employment of the British Vacuum Cleaner Company, and was summoned under section 54 of the Metropolitan Police Act, 1839, for wilfully causing an obstruction with the apparatus which was used in Trebovir-road from 10 a.m. to 5.30 p.m. on one day. The police magistrate found that the business purpose was reasonable, the time reasonable, and the time and space occupied not excessive, but he convicted because the process was experimental, and not an ordinary incident of every day life necessary for comfort. The Divisional Court set aside the conviction on the facts as found above, since no obstruction in fact had apparently occurred, and the user was found to have been reasonable.

CAPITAL AND LABOUR.

PLASTERERS' STRIKE, WALSALL.—On the 10th inst. the plasterers engaged on the Walsall Town Hall, which is nearing completion, came out on strike, a dispute having existed several weeks. The Plasterers' Society claim that the men should have Leeds prices, a penny more than Walsall, but the sub-contractors, Messrs. B. Mountain and Son, of Leeds, refuse to pay more than the Walsall rates.

Legal.

BUILDING A CHURCH AT STONE.

AT Staffordshire Assizes last week the suit of the Rev. John R. Line and others, of Stone, against Messrs. Lynam, Beckett, and Lynam, architects, Stoke, was heard in the Nisi Prius Court before Mr. Justice Ridley and a special jury. The action was to recover damages from the defendants (assessed on the pleadings at 300*l.*) on the ground of alleged negligence by the defendants as the architects engaged in the late re-erection of the nave, roof, and aisles of Christ Church, Stone. Mr. Arthur Powell, K.C., and Mr. B. C. Brough (instructed by Mr. H. Walters, Stone) were for the plaintiffs, and Mr. A. T. Lawrence, K.C., and Mr. Disturnal (retained by Messrs Paddock and Sons, Hanley) represented the defendants. The evidence showed that in 1896 the church authorities determined to have the church rebuilt, and defendant was employed to prepare plans, specifications, etc. The tender of a builder was accepted for the work, and plaintiffs alleged that, owing to the negligence of the defendant, the builder did not do his work properly, to such an extent that rain fell from the roof and draughts were very common. Defendant was written to about the matter, but nothing was done to remedy the roof of the church. At length the church authorities had to call in other architects, and it was found that the slates were not of the quality specified, or the tiles, and that the boards of the roof were not properly seasoned and were shrunk. Another builder was called in, and the plaintiffs now sued for the amount they had to pay him to put the church right. Defendant, it was alleged, gave the builder in the first instance a certificate showing that the work was properly done. Mr. A. T. Lawrence, K.C., addressed the jury on behalf of the defendants. He said that there was a necessity of keeping down expenditure. It was like a tailor, who had to cut his cloth according to the coat.—Mr. Justice Ridley, on this, remarked that in that case they had to imagine there was a coat to cut for. The plaintiffs' case was that they practically had no church because it was not habitable.—Mr. Lawrence resented this remark from the judge, but the latter said he begged Mr. Lawrence to continue his case.—Mr. Lawrence said the judge had said there was no church. It made it impossible to continue the case before him if he told the jury they had not even got a church.—The defence was that suitable materials were put in for the money, and that adequate supervision was given.—The jury found a verdict for plaintiffs, and assessed damages at 274*l.* less the counter-claim of 103*l.* for architects' fees.—The judge said no costs would be allowed on the counter-claim.—*Staffordshire Sentinel.*

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THE WOOD-PAVING LITIGATION.

IN the King's Bench Division on the 11th inst. the hearing was concluded of the case of Alcott *v.* Millar's Karri and Jarrah Forests, Ltd., and Green, before Mr. Justice Grantham and a special jury.

The action was brought by the plaintiff, Mr. Edw. Alcott, a contractor, to recover damages from the defendants for alleged libel contained in a letter, dated May 14, 1902, and written by the defendant, W. L. Green, on behalf of the defendant company to the Marylebone Borough Council. The letter complained of ran as follows:—"We understand that your Council propose laying the roadway of Oxford-street with American red-gum blocks. We would very strongly recommend that, before deciding upon this, you should pay a visit of inspection to Piccadilly, Waterloo-place, Haymarket, and Whitehall, the roadways of which have been paved with American red gum only from six to eighteen months, and are now in a rotten condition. We venture to say that the result of such a visit would certainly remove from your mind any idea of using such material for roadways in your district.—We remain, yours truly, Millar's Karri and Jarrah Forests, Ltd. (Signed) Walter L. Green for Joint Managing Directors." The plaintiff's case was that the defendants had written this letter to prevent him getting the contract with the Marylebone Borough Council to pave Oxford-street, and that in consequence of the letter he had had to amend his contract and make a reduction in price, and allow 25 per cent. of the contract price to be retained by the Council as a guarantee of the sound quality of his wood. The defence pleaded was that the letter complained of was not libellous, that the statements contained in it were true in substance and in fact, and were fair comment upon a matter of public interest.

A great mass of evidence, technical and otherwise, was called, and in the result the jury awarded the plaintiff 250*l.* damages.

Judgment accordingly.

A stay of execution was granted on the defendants bringing the costs and damages into court.

The plaintiff conducted his case in person; Mr. Rufus Isaacs, K.C., Mr. C. F. Gill, K.C., and Mr. Chas. Mathews represented the defendant company; and Mr. Edw. Morten the defendant Green.

ABOLITION OF OFFICE-SURVEYOR'S COMPENSATION.

MR. JUSTICE BUCKLEY, sitting as an additional Judge of the King's Bench Division last week, delivered a considered judgment in the case of Livingstone *v.* the Mayor, etc., of Westminster, an action by the plaintiff for a declaration that he was entitled to a certain amount of compensation upon the abolition of his office of Surveyor by the defendants. The facts sufficiently appear from his Lordship's judgment.

His Lordship, in giving judgment, said that when the London Government Act of 1899 came into effect in 1900 the plaintiff was an existing officer of the Vestry of St. George's, Hanover-square, within section 30, sub-section 1, of that Act. Under the scheme the Westminster City Council, the successors of the Vestry, had power to agree with the plaintiff as an existing officer of the Vestry for a continuance of his office for a temporary period without prejudice to any right to compensation under the Act of 1899. The Act came into operation in November, 1900, and the Council, on January 31, 1901, passed a resolution for his temporary re-employment at a certain salary without prejudice to compensation for abolition of the office. On May 9, 1901, the Council resolved that his office be abolished as from May 31, 1901, and they asked him to send in his claim for compensation. Plaintiff did so. On August 1, 1901, the Council passed a resolution granting him an allowance of 518*l.*, and they now said that in sending in his claim, the plaintiff gave the particulars of salary and emoluments relating to a wrong period of five years, and that he was not entitled to the amount claimed. The Council said that, having regard to section 120, sub-section 2, the proper five years would have been the five years commencing before the passing of the Act of 1899. His Lordship did not agree. The Local Government Act of 1888 said it was not to be in respect of any particular period, but generally. If the plaintiff had selected the wrong five years the Council should have asked him for another return. But, having his claim, the Council assessed his compensation and passed the resolution on August 1. The first question he had to consider was whether that resolution was valid. The only grounds on which it was attacked was that the *maximum* sum for which it was rated, thirty-seven-sixtieths of the salary, and emoluments—viz., 841*l.*, of which 518*l.* was thirty-seven-sixtieths, was alleged to have been in excess of the salary and emoluments. The maximum was arrived at by Act of Parliament, and, having regard to the plaintiff's length of service, his *maximum* was thirty-seven-sixtieths of his salary and emoluments. The facts to be elucidated were to ascertain what the plaintiff's salary and emoluments were. The defendants contended that the question of fact viz., the amount of salary and emoluments was not one to be dealt with by the Council, but one for the Court to examine and determine, and if the Court found that 841*l.* was in excess of his salary and emoluments, the resolution of the Council was *ultra vires* and wholly void. In his Lordship's opinion that contention was not well founded. It was for the Council to determine the fact what the salary and emoluments amounted to, and if they considered it and arrived at a decision it was not competent for the Court to review that decision. The Council had a right of appeal to the Treasury. It was for the Council, and not for the Court, to say what was the amount of the salary and emoluments of the office abolished. The defendants' contention then on that point failed. It was for the Council or the Treasury, and not for the Court, to determine this question of fact. The question of *ultra vires* did not therefore arise. He thought that the resolution of August 1 was valid. It was next said that on November 20, 1902, the Council rescinded the resolution. The plaintiff said that the Council had no power to do so, and, in his Lordship's opinion, the plaintiff was right. It was therefore unnecessary to consider questions as to the meeting of November 20. In his opinion it was not for him to review the figure which the Council adopted. The plaintiff therefore succeeded, and the defendants would have to pay the costs of the action. There was a motion as to the Auditor surcharging the Council with the extra amount said to be granted, but the result of this decision was that that surcharge was wrong.

Judgment accordingly.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

3,477 of 1903.—J. W. BROWN: *Lifts, Hoists, and the like.*

This relates to lifts, hoists, and the like, according to which a closed hydraulic circuit is employed, in which the cage and approximately half the load are counterbalanced, and in which an electric motor serves to augment the pressure of water according to the duty required, either on an upward or a downward journey of the lift cage.

5,241 of 1903.—W. SIMMONS and H. S. KINGERLEE: *Fire Economiser for Cooking Stoves and Ranges.*

This consists in the front bars of cooking ranges being so constructed that they can be raised up and made to slide in a groove at the side of the bar frame, thus forming the bottom grate for a shallow fire when the oven is not required for cooking purposes.

5,623 of 1903.—W. L. BRENTHALL: *Construction of Tables, Chairs, Bedsteads, and like Articles of Furniture.*

This invention consists in cutting a "V," or other suitable groove, out of any convenient portion of the leg and then mitreing the rails, or stretchers, at both ends, so that when brought together, mitre to mitre, the angle that they form fits closely into the groove provided in the leg. A bolt, or screw, or other suitable fastening is then passed through the leg and between the rails, or stretchers, at each corner, which is secured with a suitable stay, or corner block, and nut. When the bolt is tightened the rails are jammed firmly into the groove in the leg. The rails are then screwed to the top in the usual manner.

7,601 of 1903.—J. GREEN and W. GREEN AND CO., LTD.: *Cooking Ranges, and the like.*

A cooking range, or the like, consisting in the combination with a hood, comprising two side-wings of a lug on the inner wing extending beyond the hinge of the wing, a lug on the outer wing, and a link connecting the lugs.

8,593 of 1903.—S. FLAVEL, C. E. R. TERRY, G. H. WALKER, and S. R. FLAVEL: *Field Boilers, and like Cooking Apparatus.*

A portable field set of cooking apparatus, comprising a number of separate complete cooking apparatus, each consisting of a casing, boiler, furnace grate, and other necessary details, all so adapted that each series of articles may be nested together, and also so that the nested grates, with the other loose parts, may be placed within a small casing, the whole set of apparatus thus being made to occupy a minimum space to facilitate transport.

8,739 of 1903.—L. J. NEWTON: *Fireplaces.*

According to this invention, a skeleton, or open frame, of box-like formation is employed, having outwardly projecting end flanges. This box-like frame is built in with the brickwork when constructing the fireplace, and takes the place of the ordinary brick relieving-arch, or stone, to carry the upper brickwork. The range, on being afterwards placed in position within the fireplace, can be set with facility, as the builder can get his head and hands through the box-like frame, whereby he is enabled to perform the work effectively and with comparative ease. After the range has been set, the open, or box-like frame, is filled in with bricks so as to form a solid lintel, and it will be understood that the bricks in the box-like frame may be quickly removed without having to destroy the setting of the fireplace when repairs are required.

10,025 of 1903.—HOSKINS AND SEWELL, LTD., and J. MCEWAN: *Jointed Stays, or Struts, for use in connexion with Settee-berths and other Folding Furniture.*

Jointed, or folding stays, or struts, for ships' berths and other folding furniture, which consists in rigidly securing the jointed stay members in their extended position by means of a locking-pin, stud, or projection, carried by one of the stay members at a point removed from the joint, or folding centre, and a corresponding gap, or recess, on the other member, the said locking device being adapted to be engaged with one another when the said stay members are brought into line, whilst the joint connexion between the folding members is made by a pin and slot, or equivalent arrangement, which admits of the engagement and disengagement of the locking devices by a relative movement.

20,765 of 1903.—C. F. CHRISTON: *Heating and Cooking Apparatus.*

A heating and cooking apparatus, comprising a furnace and flue, a removable cooking-pan, or other like receptacle, located immediately over the furnace, a hollow removable cover covering the top of the receptacle, into which all steam and vapour from the receptacle rise, and a flue-pipe for carrying off the steam, or vapours, from the cover to the furnace flue, whereby steam and offensive vapours are got rid of expeditiously instead of filling the apartment.

23,620 of 1903.—F. A. MURRAY and C. A. MURRAY: *An Adjustable Shooting-board to be used in connexion with Carpentry Work.*

This device consists of two rectangular wooden uprights of any width, or height, placed at any distance apart at right angles to, and flush with, the shooting edge of a shooting-board. These are connected by a base, and extend any width to the shooting edge. Between these two uprights a tilting table, having one of its longitudinal edges rounded, is so hung on pivots driven through the rectangular uprights that the rounded edge is flush with the shooting edge of the board. With the pivots as centres, slotted arcs are provided in the two uprights at convenient radius, so that when the tilting-table is moved on the pivots, a constant edge is presented to the plane used for bevelling. This tilting-table is clamped at different angles by means of screws, or fasteners, travelling in the slotted arcs aforesaid. A slot is cut through the centre of the tilting-table parallel with the shooting edge and to within a short distance of each end, which slot carries travelling bolts, to which are attached two slotted blocks of any dimensions, which, being thus slotted, will clamp the work to be planed in any position desired.

1,091 of 1904.—C. R. CATCHPOOL: *Manufacture of Fixing, or Nailing, Bricks and Blocks.*

A method of making porous bricks, or the like, by mixing and grinding together in a perforated grinding pan shale, or other suitable brick-making material, combined with preferably about 25 per cent. to 50 per cent. of a highly inflammable material, such as sawdust, or the like, conveying the mixture which passes through the perforated bottom of the grinding-pan to a mixing machine, where water is added to render the mass sufficiently plastic, and forming it into bricks, or blocks, by means of any suitable brick-making machine, or by hand moulding.

1,275 of 1904.—F. W. MELLOWS: *Roof Glazing.*

According to this invention, each glazing bar is provided with a cleat, or the like, preferably bolted to its underside, and so shaped as to be adapted to clamp a portion of the roof purlin to which the glazing bar is to be secured between the latter and itself. These cleats are preferably attached in the required positions to the glazing bars in the shop where the latter are made so that the glazing bars may be quickly and easily secured in position to the roof purlins, and so that the minimum amount of work is necessary on the roof.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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1,315 of 1904.—W. A. HILDYARD: *Bolts, or Fasteners for Doors, Windows, and the like.*

This consists in constructing bolts, or fasteners, for doors, windows, and the like in such a manner that they are automatically shot and locked, that they cannot lock accidentally, and that the shoot cannot be forced back from the outside.

9,455A of 1903.—G. DALTON: *Combinations of Stone or Ore Crushers, Elevators, and Screeners.*

This consists in the combination and construction of a travelling, or wheeled, platform carrying a stone-breaker or ore-crusher mounted longitudinally thereon, a bucket elevator, having the shafts of its lower and upper drums placed longitudinally with respect to said platform, a discharge shoot delivering broken, or crushed, material from the jaws of the breaker, or crusher, to the interior of the bottom, or receiving drum, of the elevator, and a screening drum placed longitudinally and forming a continuation of the upper drum of said elvator.

1,103 of 1904.—M. FAWCETT: *Construction of Fireproof Floors, Ceilings, and Roofs.*

The construction of fireproof floors, ceilings, and roofs in combination with concrete, either alone or with lintels, and iron or steel joists, having lower flanges of larger sectional area than the upper flanges.

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SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 2.—By KEMSLEYS' (at Braintree).

Felstead, Essex.—"Hick's Farm," 48 a. 2 r. 28 p., f. and c. £520
"Upper Kay's Farm," 35 a. 0 r. 17 p., f. and c. 750
Seven enclosures, 48 a. 0 r. 21 p., f. and c... 606

By March 3.—C. F. MOORE (at Cheltenham).

Withington, Glos.—A freehold farm, 85 acres. . 1,375
"Hadden House" and two cottages, f. 260
"Coats Close," 2½ acres, f. 100
"Compton Hill Ground," 15 acres, f. 210
"Sheppy Farm," 60 acres, c., subject to a life aged 69. 260

By T. S. PLOMMER (at Woolwich).

Plumstead, Kent.—218 to 230 (even), High-st., f., w.r. 146*l.* 4s. 2,000

March 7.—By B. BAILEY & CO.

Ilford.—1, Adelaide-ter., area 2,175 ft., f., p. .. 720

By WM. HOUGHTON.

Clapton.—3, Goulton-rd., f., e.r. 60*l.* 900

By ROBSON & PERRIN.

Holloway.—28, Benwell-rd., u.t. 59½ yrs., g.r. 8*l.*, y.r. 36*l.* 395
Dalston.—14, Colveston-cres., u.t. 52 yrs., g.r. 7*l.*, y.r. 46*l.* 380

By STICKLAND & HART.

Norwood.—4, Anerley-gr., u.t. 50 yrs., g.r. 8*l.*, y.r. 37*l.* 14s. 195
26, Whiteley-rd., u.t. 62½ yrs., g.r. 6*l.*, y.r. 30*l.* 270
46, 46a, 48, 48a, 50, and 50a, Rothschild-st., u.t. 95 yrs., g.r. 24*l.*, w.r. 163*l.* 16s. 1,200
Dulwich.—28, Park-rd., u.t. 55½ yrs., g.r. 10*l.*, y.r. 45*l.* 390

By WALTER VINCENT.

Harrow, Middlesex.—16, Butler-rd., u.t. 94 yrs., g.r. 10*l.*, y.r. 65*l.* 550

By T. LAVINGTON (at Swindon).

Ogbourne St. George, Wilts.—"South End Farm" (or "Hallams"), 164 a. 2 r. 18 p., f., p. 1,660
Seven freehold tenements and 0 a. 1 r. 16 p.. 100
Residence, tenement, and 0 a. 0 r. 16 p., u.t. 103 yrs., g.r. nil 150
Enclosure of land, 7 a. 2 r. 9 p., f. 260

March 8.—By LEOPOLD FARMER & SONS.

Kilburn.—304, High-rd, (s.), u.t. 78¼ yrs., g.r. 35*l.*, y.r. 250*l.* 3,320
17, Brondesbury-rd., u.t. 56 yrs., g.r. 13*l.*, e.r. 70*l.* 575

By ROGERS, CHAPMAN, & THOMAS.

Pimlico.—38, 44, and 46, Belgrave-rd., u.t. 21¼ yrs., g.r. 30*l.*, y.r. 380*l.* 3,240
73, Denbigh-st., u.t. 27¼ yrs., g.r. 8*l.*, e.r. 75*l.* 585
Brompton.—110, Ifield-rd., u.t. 62¼ yrs., g.r. 7*l.* 10s., p. 340

By BOYTON, SONS, & BUCKMASTER (at Fulham).

Fulham.—16, Peterborough-rd., f., w.r. 54*l.* 12s. 375
52, Britannia-rd., u.t. 52½ yrs., g.r. 5*l.*, y.r. 43*l.* 380

By S. WALKER & SONS (at Brentford).

Brentford, Middlesex.—73, 74, and 75, High-st., with stabling in rear, area 3,850 ft., f., y.r. 30*l.* 550
255, High-st., and "One Tun Yard," area 6,450 ft., f., y.r 15*l.* 520

By J. C. PLATT (at Hammersmith).

Shepherd's Bush.—89 and 91, Becklow-rd., u.t. 74 yrs., g.r. 10*l.* 10s., w.r. 59*l.* 16s. 410

March 9.—By H. J. BROMLEY.

Forest Hill.—33, Kilmorie-rd., f., e.r. 38*l.* £525

By FRITH, GARLAND, & CO.

Harringay.—61, Pemberton-rd., u.t. 89½ yrs., g.r. 6*l.* 10s., y.r. 36*l.* 375

By HAROLD GRIFFIN.

Battersea.—15, 17, and 19, Stockwood-st., u.t. 62 yrs., g.r. 12*l.*, w.r. 66*l.* 6s. 450
22 and 23, Warsill-st., u.t. 61 yrs., g.r. 9*l.*, w.r. 71*l.* 10s. 500

By E. & S. SMITH.

Clerkenwell.—7 and 15, Baker-st., and 28a, St. Helena-pl., u.t. 7¾ yrs., g.r. 9*l.* 13s. 4d., y.r. 104*l.* 16s. 230
Fortis Green.—5, Cheapside (s.), u.t. 93¾ yrs., g.r. 15*l.*, e.r. 55*l.* 300
Brockley.—36, Adelaide-rd., u.t. 61¾ yrs., g.r. 8*l.*, e.r. 42*l.* 375
Notting Hill.—57, Blenheim-cres., u.t. 58 yrs., g.r. 12*l.* 2s., y.r. 52*l.* 2s. 435

By WAGSTAFF & SONS.

Canonbury.—12, Marquess-rd., u.t. 41¼ yrs., g.r. 10*l.*, e.r. 56*l.* 510

By WYATT & SONS (at Chichester).

Chichester, Sussex.—30, Westhampnett-rd., also mason's and builder's yard, and plot of land, part freehold and part long leasehold, p. 820
1 and 2, St. James'-rd., f., y.r. 22*l.* 16s. .. 335
10, Franklin-pl., f., y.r. 10*l.* 16s. 170
Hunston, Sussex.—Freehold cottage, y.r. 11*l.* 14s. 160

March 10.—By BISLEY & SONS.

Stratford.—12, Cruickshank-rd. (s.), f., y r. 36*l.* 415
Rotherhithe.—602, Rotherhithe-st., f., w.r. 26*l.* 280

By CHESTERTON & SONS.

West Kensington.—23 to 29 (odd), Gunterstone-rd., u.t. 73 yrs., g.r. 44*l.*, y.r. 230*l.*.. 2,170
Chiswick.—341, Chiswick High-rd. (s.), u.t. 75¼ yrs., g.r. 15*l.*, y.r. 80*l.* 1,070

By CRASKE & SONS.

Manor Park.—21, Albany-rd., u.t. 72½ yrs., g.r. 3*l.* 16s., q.r. 23*l.* 215

By FAREBROTHER, ELLIS, & CO.

Walthamstow.—The Marshes, five pieces of freehold grazing land, 5 a. 1 r. 20 p..... 450

By HAMPTON & SONS.

Finchley.—Granville-rd., "Holdenhurst," and block of building land, 13 acres, f. 11,480
Granville-rd., plot of building land, 0 a. 1 r., f. 600
Lingfield, Surrey.—Two freehold cottages and 0 a. 1r. 36 p. 270

By HAMILTON, MIALL, & CO.

Kensington.—29, Maclise-rd. (laundry), beneficial lease for 20 yrs., y.r. 70*l.*, with goodwill, plant, etc. 210
Shepherd's Bush.—1 and 3, Uxbridge-rd., profit rental of 88*l.* 18s., u.t. 10 and 12 yrs. 255

By NEWBON, EDWARDS, & SHEPHARD.

Victoria Park.—76, 78, and 80, White Post-la., u.t. 56 yrs., g.r. 9*l.*, w.r. 93*l.* 12s. 495
Somers Town.—47, 48, and 49, Clarendon-st., u.t. 26¾ yrs., g.r. 30*l.*, w.r. 102*l.* 18s. 400
61 and 62, Clarendon-st., w.r. 91*l.*; also i.g.r. 10*l.*, u.t. 10¾ yrs., g.r. 30*l.* 140
Tottenham.—30 to 40 (even), Montague-rd., u.t. 66 yrs., g.r. 23*l.* 5s., w.r. 163*l.* 16s. .. 870
Ball's Pond.—20 to 28 (even), King Henry's-walk, f., w.r. 161*l.* 4s. 1,640
Holloway.—61, Cornwallis-rd., u.t. 51 yrs., g.r. 5*l.* 5s., y.r. 30*l.* 300

By STIMSON & SONS.

Walworth.—277, Walworth-rd., and 2, 4, 6, and 8, East-st. (s.), f., y.r. 200*l.* 4,100
279 to 295 (odd), Walworth-rd. (s.); also 1, Walworth-pl., f., y.r. 745*l.* 15,425
Walworth-rd., "Sir William Walworth," p.h., f.g.r. 150*l.*, reversion in 29 yrs. 5,850
301 to 309 (odd), Walworth-rd. (s.), f., y.r. 395*l.* 8,000
Walworth-pl., f.g.r. 33*l.*, reversion in 59 yrs.. 925

By G. A. MCDOWALL (at Stratford).

Plaistow.—31, 33, and 35, Gordon-st., f., w.r. 68*l.* 18s. 530
48 and 50, Grange-rd., f., w.r. 36*l.* 8s. 300
1, Meredith-st., f., w.r. 19*l.* 10s. 160
35, Cecil-rd., f., y.r. 32*l.* 365

March 11.—By PRICE, ARROW, & TAYLOR.

Battersea.—22, Winstanley-rd., u.t. 60½ yrs., g.r. 6*l.*, w.r. 33*l.* 16s. 195

By WILLIS, CROUCH, & LEE.

Ealing.—Windmill-rd., "Oak Villa" and "Ash Villa," u.t. 72 yrs., g.r. 15*l.*, y.r. 56*l.* 480

By WINDRUM & CLEAVE.

Plaistow.—2, Lower-rd., u.t. 74 yrs., g.r. 5*l.*, w.r. 31*l.* 4s. 250

***Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.**

MEETINGS.

FRIDAY, MARCH 18.

Institution of Mechanical Engineers.—M. Edouard Sauvage on "Compound Locomotives in France." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "House Drainage." 7 p.m.

SATURDAY, MARCH 19.

Architectural Association.—Fifth spring visit, to the Belgrave Hospital for Children, Clapham-road, by permission of Mr. H. P. Adams.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., on "The Life and Work of Stokes," V. 3 p.m.

London Association of Correctors of the Press.—Jubilee Dinner, Grand Hall, Hotel Cecil, The Right Hon. Viscount Goschen, P.C., in the chair. 6.30 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Morden Hall Dairy Farm, Morden, Surrey. 3 p.m.

Junior Institution of Engineers.—Conversazione at the Westminster Palace Hotel. 7 p.m.

Institute of Sanitary Engineers, Ltd.—Visit to the new buildings of the Prudential Assurance Co., Ltd., Holborn Bars, London, W.C. 3 p.m.

MONDAY, MARCH 21.

Surveyors' Institution.—Discussion on the paper recently read by Mr. H. J. Elwes, F.R.S., entitled "British Timber and its Uses." 4 p.m.

Regent-street Polytechnic (University Extension Lectures).—Professor Vivian Lewes on "The Chemistry of Air, Fire, and Water," VIII. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. Bertram Blount, F.I.C., on "Recent Advances in Electro Chemistry," III. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. E. Worth on "Water Supply, Sources of Supply, and Distribution." 7 p.m.

Liverpool Architectural Society.—Mr. Hastwell Grayson, M.A., on "The Domestic Flue."

TUESDAY, MARCH 22.

Institution of Civil Engineers.—Papers to be further discussed: (1) "The Use of Cement Grout at the Delta Barrage in Egypt," by Sir R. Hanbury Brown, K.C.M.G., M.Inst.C.E.; and (2) "The Barrage Across the Nile at Assyut," by Mr. G. H. Stephens, C.M.G. Time permitting, Papers to be read: (1) "Lowering the Sill of the Ramsden Dock, Barrow-in-Furness," by Mr. Leopold Halliday Savile; and (2) "Burntisland Harbour: Construction of the East Dock," by Mr. R. Henderson. 8 p.m.

Architectural Association Camera and Cycling Club.—Mr. F. R. Taylor on "The Excursions of the A.A. Camera and Cycling Club in 1903." 7.30 p.m.

WEDNESDAY, MARCH 23.

Society of Arts.—Mr. T. Brice Phillips on "The Rural Housing Question." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Quarterly Meeting of the Directors. 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(1) Inspection in the district of Hackney. (2) Mr. J. E. Worth on "Sewerage." 7 p.m.

Institute of Sanitary Engineers, Ltd.—Extraordinary General Meeting, 4.30 p.m. Council Meeting, 6 p.m.

St. Paul's Ecclesiological Society.—Mr. G. C. Druce on "Painting and Sculpture in the Roman Catacombs," illustrated by limelight views. 8 p.m.

THURSDAY, MARCH 24.

Carpenters' Hall (Free Lectures on Matters Connected with Building).—Mr. Basil Mott on "Development of Methods of Locomotion." 8 p.m.

Leeds and Yorkshire Architectural Society.—(1) Mr. J. Starkie Gardner, F.S.A., on "Architecture in Lead." (2) Election of Officers and Exhibition of R.I.B.A. Prize Drawings. 6.30 p.m.

Institution of Electrical Engineers.—Mr. K. Edgcumbe and Mr. F. Punga on "Direct Reading Measuring Instruments for Switchboard Use." 8 p.m.

FRIDAY, MARCH 25.

Institution of Civil Engineers (Students' Meeting).—Mr. J. M. Kennedy on "The Relative Advantages of Continuous and Alternating Current for Traction Purposes." 8 p.m.

Royal Institution.—Professor Dewar on "Liquid Hydrogen Calorimetry." 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. E. Worth on "Sewage Disposal." 7 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. W. H. Baxter on "Some Woodworking Tools and their Economic Working." 8 p.m.

SATURDAY, MARCH 26.

Sanitary Institute (Sessional Meeting).—Mr. W. E. Riley, Architect to the L.C.C., on "Municipal Re-Housing." 11 a.m. Visit in the afternoon to L.C.C. dwellings.

Royal Institution.—Right Hon. Lord Rayleigh, M.A., on "The Life and Work of Stokes," VI. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage Outfall Works, Barking. 3 p.m.

Edinburgh Architectural Association.—Visit to Gothic Ironworks, Falkirk.

TO CORRESPONDENTS.

W. G.—J. B. W. (Below our limit).—N. C. H.—J. P.—P. W. (Amounts should have been stated).—G. W. (We do not insert lists of tenders when amounts are not stated, unless the work is carried out at a schedule of prices).

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" at railway depôt.
Red Wire Cuts	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	18 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality, White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	30 0	per ton, "
Best Ground Blue Lias Lime	21 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8¼	" "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancester in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
CloseburnRedFreestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality.*

	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides (slabs random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
" " " 6 in. sawn both sides	landings 2 7	per ft. super. deld. rly. depôt
" " " 3 in.	do. 1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 best seconds "	12 15 0	" "
20 × 12 " " "	13 10 0	" "
16 × 8 " " "	7 0 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 best blue Portmadoc	6 12 6	" "

SLATES—(*continued*).

	£ s. d.	
20 × 10 best Eureka unfading green	15 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	17 2 6	" "
18 × 10 " "	12 10 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 10 0	" "
18 × 10 " "	9 10 0	" "
16 × 8 " "	6 10 0	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. " "
Best Brosely tiles	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " "
Hip and Valley tiles	4 0	per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 " "
Do. Ornamental do	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced	50 0	per 1000 " "
Do. pressed	47 6	" " "
Do. Ornamental do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD. At per standard.

	£ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards—		
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"

Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOINERS' WOOD.

White Sea: first yellow deals,	At per standard.	
3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks—per ft. cube	0 4 0	—

Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6

WOOD—(*continued*)—

	Per square. £ s. d.	£ s. d.
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do.	0 10 0	0 11 6
1 in. by 7 in. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ...	7 5 0
Compound Girders, ordinary sections	8 2 6 ...	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ...	8 17 6
Flitch Plates	8 5 0 ...	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ...	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 5 0 ...	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0 ...	8 5 0
Staffordshire "Marked Bars"	10 0 0 ...	—
Mild Steel Bars	8 15 0 ...	9 5 0
Hoop Iron, basis price	9 5 0 ...	9 10 0
" " Galvanized	17 10 0 ...	—
(*And upwards, according to size and gauge.)		
Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ...	—
" " 24 g.	10 15 0 ...	—
" " 26 g.	12 5 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ...	—
Ordinary sizes to 22 g. and 24 g.	13 5 0 ...	—
" " 26 g.	14 5 0 ...	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ...	—
" " 22 g. and 24 g.	16 10 0 ...	—
" " 26 g.	18 0 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0 ...	—
" " " 26 g.	14 0 0 ...	—
Cut nails, 3 in. to 6 in.	9 0 0 ...	9 10 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 10 0 ...	—
Pipe in coils	15 0 0 ...	—
Soil pipe	17 10 0 ...	—
Compo pipe	17 10 0 ...	—
ZINC—Sheet—		
Vieille Montagne ton	26 5 0 ...	—
Silesian	26 0 0 ...	—
COPPER—		
Strong Sheet per lb.	0 0 10½ ...	—
Thin " "	0 0 11½ ...	—
Copper nails "	0 0 11 ...	—
BRASS—		
Strong Sheet per lb.	0 0 10 ...	—
Thin " "	0 0 11 ...	—
TIN—English Ingots "	0 1 4 ...	—
SOLDER—Plumbers' "	0 0 6½ ...	—
Tinmen's "	0 0 8 ...	—
Blowpipe "	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d.	per ft. delivered.
" fourths	1½d.	" "
21 oz. thirds	3d.	" "
" fourths	2½d.	" "
26 oz. thirds	3½d.	" "
" fourths	3d.	" "
32 oz. thirds	4½d.	" "
" fourths	4d.	" "
Fluted Sheet, 15 oz.	2½d.	" "
" 21 oz.	3½d.	" "
⅛ Hartley's Rolled Plate	1½d.	" "
¼ " " "	1¾d.	" "
¼ " " "	2½d.	" "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 7
" " " in drums	"	0 1 10
Boiled " " in pipes or barrels	"	0 1 10
" " " in drums	"	0 2 1
Turpentine, in barrels	"	0 3 9
" in drums	"	0 3 11
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	"	19 0 0
Best Linseed Oil Putty	per cwt.	0 7 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

*** Denotes *accepted.* † Denotes *provisionally accepted.***

ALVASTON (near Nantwich).—For the erection of an infectious diseases hospital, for the Nantwich Joint Hospital Board. Mr. C. E. Davenport, architect, Nantwich :—

J. H. Holt	£11,100	0 0	J. Harding	£8,790	10 0
Marshall	10,818	0 0	Cox & Vaughan	8,697	0 0
Geo. Bullock	9,370	0 0	Thos. Huxley	8,650	0 0
Thos. Smith & Son	9,193	0 0	Townson & Son	8,399	10 0
J. Williams & Sons	9,114	0 0	Birchall Bros.	8,336	0 0
Mickiewright & Son	9,085	0 0	Gallimore	8,287	0 0
			J. T. Gresty	8,100	0 0
			F. Matthews, Nantwich*	7,700	0 0

ASKERN.—For rebuilding Railway Hotel, Askern. Messrs. Garside & Pennington, architects, Ropergate-chambers, Pontefract :—

Bourne & Wilkinson	£2,298	16 9	James Bryant & Son	£1,788	13 9
F. Foers & Son	2,084	2 8	Thompson & Co.	1,697	10 0
Dennis, Gill, & Son	1,867	0 0	Wm. Barton	1,630	0 0
Kelsey	1,851	0 0	H. Mollekin	1,584	0 0
Ullathorne	1,840	0 0	W. Darley, Pontefract*	1,562	15 3

BARNARD CASTLE.—Accepted for the erection of house, Staindrop-road, for Mr. J. Hardy. Mr. T. Farrow, architect, 7, Market-place, Barnard Castle. Quantities by architect :—

Bricklayer and Mason : C. Martin*	£226 14 10
Joiner : C. Martin*	91 17 3
Slater : C. Martin*	21 7 11
Plasterer : C. Martin*	25 0 0
Plumber : C. Raine*	35 0 0
Painter : J. Wrathall	7 5 0

BEDWAS (MON.). — For erecting twenty-seven dwelling-houses, for the Trustees of Bedwas Building Club. Mr. G. L. Watkins, architect, Station-terrace, Caerphilly :—

	Per house.		Per house.
W. & D. Thomas	£225	5	Isaac Williams £189 0
T. F. Howells	222	0	Williams Bros., Roath House, Bedwas* 185 15
A. Herne & Co.	220	0	
J. Charles	205	0	T. Rossiter & Sons 185 0
T. W. & E. J. Jenkins	199	10	
Colin Sava	£191	10	M. Harding 180 0

BRIDLINGTON.—For erecting a detached residence in Cardigan-road, for Mrs. Bentley. Mr. J. Earnshaw, architect, Carlton House, Bridlington :—

R. Musk	£635	18 0	E. Wilson	£527	0 0
J. Rennard	595	10 0	W. Hoggard	525	10 0
T. Spink	594	15 0	A. A. Booth	522	0 0
T. Wood	582	15 0	Smallwood & Straw	516	4 0
Sampson & Siddall	548	0 0	T. Kneeshaw	514	0 0
A. Gardam	533	19 6	J. Sawdon*	506	0 0

[All of Bridlington.]

BRIGHTON.—For new engineering workshop, etc., at the Municipal Technical School, for the Education Committee :—

G. R. Lockyer	£1,866	J. Barnes	£1,647
J. & W. Simmonds	1,778	R. Cook & Sons	1,636
J. Parsons & Sons	1,674	Sattin & Evershed, Freshfield-road, Brighton†	1,630
Rowland Bros.	1 669		
W. A. Field & Co.	1,661		
J. Longley & Co.	1,649		

CLEETHORPES (Lincolnshire).—For the erection of a fire-station and cart-sheds, etc., in Poplar-road, for the Cleethorpes-with-Thrunscoe Urban District Council. Mr. E. Rushton, Engineer and Surveyor, Poplar-road, Cleethorpes :—

Charles Lewis	£915	0	G. F. Mashford 569 0
H. Marrows	662	0	William Ion, Cleethorpes* 528 0
T. & E. G. Wilkinson	600	0	

CORK.—For the erection of a Celtic cross at Gill Abbey, for the Committee of the Soldiers' Memorial. Messrs. W. H. Hill & Son, architects, 28, South-mall, Cork :—

J. Maguire, Mulgrave-road, Cork* £320

CORK.—For additions to house at Shorn Hill, Cork, for Mr. W. H. Bible, jun. Messrs. W. H. Hill & Son, architects, 28, South-mall, Cork :—

D. Kelleher, Sunday's-well, Cork £250

COWPEN.—For making up Harper-street, portion of Wright-street and Gatacre-street, and Back Waterloo-road, for the Urban District Council. Mr. Grieves, Surveyor, Seaforth-street, Waterloo, Blyth :—

Geo. E. Simpson	£429	6 3	Jas. Shannon,
Jacob Robson	426	7 9	Morpeth* £413 10 11

DANDALEITH (N.B.).—For erecting cottages, for the Countess Dowager of Seafield. Mr. J. Brydon, architect, Seafield Estates Office, Rothes :—

		Offerers.
Mason : Jas. Fraser, Green-street, Rothes*	£68 15 0	15
Carpenter : Thos. McKenzie, New Elgin, Elgin*	89 7 0	8
Slater : A. Davidson, Elgin*	29 16 0	5
Plasterer : Hume Bros., Dufftown*	30 0 0	3
Plumber : A. Davidson, Elgin*	9 6 6	9
Painter : Jas. Stewart, Rothes*	7 5 0	2
	£234 9 6	

DARTFORD.—For heating and hot-water supplies and plumbing work to additions at hospital, Bow Arrow-lane, for the Joint Hospital Committee. Mr. R. Mardant, architect, 28, Theobald's-road, London, W.C. :—

S. W. Gibson & Co., Dartford £492 10 0

DINNINGTON.—For 1,300 yds. of pipe sewers, etc., at Dinnington Colliery, Northumberland, for Seaton Burn Coal Co. Mr. H. W. Taylor, A.M.Inst.C.E., St. Nicholas'-chambers, Newcastle-on-Tyne :—

J. B. Stott	£749	J. Coxon & Son	£512
Jacob Robson	653	W. Wright	509
J. Carrick	637	G. Simpson	504
J. W. Robson	634	J. Thompson, Gosforth, Northumberland*	495
E. Henderson & Son	611		
Millward & Co.	601	E. Edgar	486
W. Carr	545		
J. Shannon	542		

GORLESTON. — For rebuilding public-house at Gorleston, near Yarmouth. Messrs. Morgan & Buckingham, architects, 3, Redwell-street, Norwich :—

J. E. Pestell	£1,440	Barham & Swan, Lowestoft*	£1,398
C. E. Earl	1,424		

GRIMSBY.—For six sewer ventilating columns, for the County Borough of Grimsby. Mr. H. Gilbert Whyatt, Borough Engineer :—

	Steel Posts.	Cast-Iron Posts.
Stone & Co., London*	£53 2 0	—
Goldthorpe & Shuttleworth	53 12 6	—
Norton Bros. & Co.	63 0 0	£60 0 0
Blakeborough & Sons	65 0 0	—
Jos. Aird	67 10 0	—
Amos-Crosta Engineering Co.	—	75 0 0
Parsons & Wills	87 0 0	75 0 0

HARROGATE.—For the supply and delivery at Masham Station of 1,000 tons of Portland cement, for the Corporation. Mr. E. W. Dixon, Engineer, 14, Albert-street, Harrogate :—

	Per ton.
Otto Trechmann & Co., Warren Cement Works, West Hartlepool*	£1 12 9

HARROGATE.—For supply at Masham Station, N.E.R., of 2,000 wooden sleepers, for quarry railway, for the Corporation. Mr. E. W. Dixon, M.Inst.C.E., 14, Albert-street, Harrogate :—

4 ft. 6 in. by 9 in. by 4½ in. sleepers.	Per sleeper. s. d.
W. S. Easson & Co., Newcastle-on-Tyne.	1 2½

HARROGATE.—For flat-bottom steel rails, etc., for Masham Quarry Railway, for the Corporation. Mr. E. W. Dixon, M.Inst.C.E., 14, Albert-street, Harrogate :—

		Per ton. / Per cwt.
T. W. Ward, Albion Works, Saville-street, Sheffield*	28lb. rails	£5 4 0
	60lb. rails	4 6 9
	Fishplates for 28lb. rails	£0 9 0
	Fishplates for 60lb. rails	0 8 3
	Railway brobs	0 11 0
	Bolts, nuts, and washers for fishplates	0 15 0

HEBBURN.—For road works in Jervis-street and other streets, for the Urban District Council. Mr. H. Paterson, Surveyor, Argyle-street, Hebburn. Quantities by Surveyor :—

J. Thompson	£968	6 2	J. McLaren & Son	£763	1 3
J. Hollings	929	17 8	G. E. Simpson	729	4 5
F. Dixon	925	10 0	T. Callaghan, Jarrow-on-Tyne*	712	14 0
G. Thornton & Co.	871	8 5			
M. D. Young	838	11 8			
Wm. Kennedy	816	12 3			

[Surveyor's estimate, £766 17s. 9d.]

HIGH HARRINGTON.—For erecting a detached villa at High Harrington, Cumberland, for Mr. B. J. Whitaker. Messrs. W. G. Scott & Co., architects, Victoria-buildings, Workington :—

Builder : G. Mann, Workington*	£190 4 0
Joiner : J. Carruthers, Workington*	99 0 0
Slater : E. Burrow, Workington*	27 0 0
Plumber : D. M. Walker, Workington*	40 0 0
Plasterer : P. Gannon, Carlisle*	42 7 6
Painter : W. T. Sherwood, Workington*	11 0 0

HOLYWOOD.—For laying street crossings, flagging and curbing footpaths, and laying water mains, for the Urban District Council. Mr. W. D. R. Taggart, C.E., Town Surveyor. Quantities by Surveyor :—

For Streets : Grainger Bros.*	£511 0 0
For Footpaths : Grainger Bros.*	22 14 0
For Three Crossings : Grainger Bros.*	47 14 0
Extension of Water Mains : Thomas Greer*	2 8 0

[All of Holywood, Down.]

HULL.—For erecting a greenhouse, potting shed, etc., East Park, Holderness-road, for the Parks and Burial Committee of the Corporation. Mr. J. H. Hirst, City Architect, Town Hall, Hull :—

J. R. Woods	£440 0	F. W. Wilson, Hull*	£270 0
J. Allison	316 14		

HULL.—For the erection of two cabmen's shelters, in Wellington-street and Nelson-street, for the Corporation. Mr. J. H. Hirst, City Architect, Town Hall, Hull :—

H. Grassby	Wellington-street	£88 0 0
	Nelson-street	112 0 0
J. H. Kelly	Wellington-street	98 16 0
	Nelson-street	87 12 0
J. Darneley	Wellington-street	77 0 0
	Nelson-street	95 0 0
C. Bray	Wellington-street	75 0 0
	Nelson-street	85 0 0
G. W. Stephenson*	Wellington-street	68 0 0
	Nelson-street	78 0 0

[All of Hull.]

ISLEWORTH.—For new road and sewer on the estate of Sir John Dickson-Poynder, Bart., M.P. Messrs. Lee & Pain, Surveyors, 63, Lincoln's Inn-fields, W.C. :—

Patman & Fotheringham	£2,993	W. Neave & Sons	£2,435
Joseph Mears	2,986	C. Killingback & Co.	2,397
		S. Kavanah & Co.	2,266

HULL.—For the erection of school buildings, etc., for the Trustees of the Boulevard Baptist Church. Mr. T. Brownlow Thompson, architect, 15, Parliament-street, Hull. Quantities by architect :—

E. Good & Son	£3,450	0 0	Bowman & Sons	£3,072	0 0
F. W. Wilson	3,438	9 7	H. Neal	3,060	11 0
Amalgamated Builders, Ltd.	3,367	9 9	F. Bilton	3,051	15 8
J. E. Train	3,145	16 4	J. Simpson & Son	3,031	10 6
G. Houlton	3,124	0 0	T. Goats	3,008	0 0
J. Railton	3,122	12 9	J. R. Woods	3,007	0 0
G. Berridge	3,094	12 7	M. Harper	2,980	19 0
			H. T. Arnott	2,959	0 0
			H. Kaye*	2,910	0 0

[All of Hull].

KILMARNOCK.—For electric lighting and tramway work for the Corporation. Messrs. Kennedy and Jenkin, engineers, 17, Victoria-street, Westminster, London :—

Arc and Incandescent Lamps, Posts, and Gear.

Oliver & Co., Woolwich*	£1,275 2 9

Feeders, Mains, Switch Pillars, and Road Work.

Callender's Cable & Construction Co., Ltd., Victoria Embankment, London, E.C.*	£14,115 8 4

Meters.

Chamberlain & Hookham, Ltd., Birmingham*	£209 2 0

KNUTSFORD.—For the erection of a free library, for the Urban District Council. Messrs. Darbyshire & Smith, architects, 17, Brazennose-street, Manchester :—

Burgess & Galt	£1,710	0	Clayton Bros. £1,482 14
Hamilton & Son	1,651	0	Hughes & Stirling 1,482 0
Beswicks	1,645	0	
Brown & Son	1,640	0	Redfern Bros., Knutsford† 1,435 0
Martin Stone	1,570	0	
J. Acton	1,510	0	

LONDON.—For stoneware pipe surface-water sewer, St. James'-lane, Muswell Hill, for Hornsey Borough Council. Mr. E. J. Lovegrove, Borough Engineer, Southwood-lane, Highgate, N. :—

J. A. Dunmore	£574	17 11	R. Ballard, Ld. £419 0 0
T. Adams	552	7 0	C. W. Killingback & Co., James-st., Camden Town* 415 19 10
Wilkinson Bros.	529	0 0	
Foster Bros.	512	0 0	
R. Jackson	476	11 3	
D. R. Paterson	468	17 0	

LONDON.—For making-up Down-lane (first portion) and Down-lane (second portion), for the Tottenham Urban District Council. Mr. W. H. Prescott, Engineer, Coombes Croft House, 712, High-road, Tottenham. Quantities by Messrs. Campbell & Son :—

	First portion.	Second portion.
E. Frost, Tottenham	£3,331 12 5†	£849 14 11
Grounds & Newton, Tottenham	3,357 9 6	847 12 0†
E. T. Bloomfield	3,370 6 0	857 18 0
O. Bloomfield	3,655 19 3	898 2 9
T. Adams	3,424 6 0	888 4 8

LONDON SCHOOL BOARD TENDERS.

Gordonbrock-road Site, Brockley : New School.

Boys' School—one story: Hall, 56 ft. by 26 ft. 4½ in.; classrooms, 56, 56, 48, 48, 40, 40, 40. Heating by low-pressure hot-water apparatus. Girls' School — one story: Hall, 56 ft. by 26 ft. 4½ in.; classrooms, 56, 56, 48, 48, 40, 40, 40. Heating by low-pressure hot-water apparatus. Infants' School—one story: Hall, 54 ft. by 26 ft. 6 in.; classrooms, 50, 50, 48, 48, 48, 48, 48. Heating by low-pressure hot-water apparatus and open fires. (School planned for future extension.) Area of site, 87,120 sq. ft. Playgrounds, area per child: boys', 66 sq. ft.; girls' 47 sq. ft.; infants', 42 sq. ft. Also Schoolkeeper's house, Cookery, and Laundry centre :—

J. Greenwood, Ltd.	£25,892	McCormick & Sons	£24,061
Perry & Co.	25,781	J. Carmichael	24,047
Leslie & Co., Ltd.	25,715	Treasure & Son	24,023
J. Simpson & Son	25,475	Hudson Bros.	24,004
J. & M. Patrick	25,464	W. Johnson & Co., Ltd.	23,995
C. Miskin & Sons	25,055	W. J. Mitchell & Son	23,993
T. L. Green	24,866	J. & C. Bowyer	23,683
E. Lawrance & Sons	24,829	Lathey Bros.	23,680
J. Garrett & Son	24,782	C. Dearing & Son	23,513
J. Longley & Co.	24,698	J. Smith & Sons, Ltd.	23,280
J. Chessum & Sons	24,607	Holliday & Greenwood, Ltd.	23,236
Martin, Wells & Co., Ltd.	24,540	G. E. Wallis & Sons	22,937
Patman & Fotheringham, Ltd.	24,211	W. Downs*	22,363
F. & H. F. Higgs	24,149		
Stimpson & Co.	24,100		
C. F. Kearley	24,076		

Holbeach-road School, Catford : Enlargement.

Enlargement: Boys', 96; girls', 96; infants', 108—total, 300. Classrooms, Boys', 56, 40; girls', 56, 40; infants', 60, 48. Providing two staircases for boys' and girls', cloakrooms for all departments. Stock rooms for boys' and girls', and teachers' rooms :—

Holliday & Greenwood, Ltd.	£5,577	J. Smith & Sons, Ltd.	£5,13
Rice & Son	5,558	Treasure & Son	5,1
Edwards & Medway	5,553	E. P. Bulled & Co.	5,0
G. E. Wallis & Sons	5,539	W. J. Mitchell & Son	5,0
J. & C. Bowyer	5,436		
W. Akers & Co.	5,201	T. D. Leng*	5,0

Bonneville-road School, Clapham Park : for Completion of New School.

The Board are now erecting a permanent school on the Bourneville-road site, Clapham Park, to provide accommodation for 996 children. The school is planned for enlargement by an additional classroom for each department, thereby increasing the total accommodation of the school to 1,124 places. The Board of Education have now approved a proposal to complete the school according to these plans at once; and the Works Committee accordingly recommended that the provision of these additional classrooms (the cost of which is estimated at £991) be carried out by Messrs. J. & C. Patrick, the contractors for the new school, on the contract schedule of prices.

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TENDERS.—LONDON SCHOOL BOARD (*continued*).

The "Alma" School, Southwark Park-road: Enlargement.

Boys': Providing two classrooms for 40 children each, head-master's room, and stock room. Girls': Providing two classrooms for 40 children each, head-mistress's room, and stock room. Infants': Providing two classrooms for 48 children each, head mistress's room, and stock room. Providing demonstration tables in boys' and girls' departments, and internal w.c.'s for teachers. The revised accommodation of the school, on the completion of the enlargement, will be—boys, 320; girls, 320; infants, 402; total, 1,042. (There is a total gain of 256 places, but as a class of 60 will be removed from each of the boys' and girls' halls and one of 80 from the infants' hall, the net gain is only 56 places):—

J. Greenwood, Ltd.	£2,985 0	J. Garrett & Son	£2,781 0
E. Triggs	2,884 0	H. Wall & Co.	2,779 0
E. P. Bulled & Co.	2,875 0	J. Marsland & Sons	2,775 0
H. Groves	2,862 0	E. B. Tucker	2,752 1
Rice & Son	2,804 0	W. Downs	2,688 0
F. G. Minter	2,803 0	G. Neal	2,672 0
Edwards & Medway	2,789 0	W. Akers & Co.	2,671 0
Holloway Bros., Ltd.	2,786 0	Lathey Bros.*	2,657 0

Sleaford-street School, Battersea Park-road, for Improvements, Including the Provision of Halls etc.

Providing halls, and additional lighting, restepping classrooms in each department; providing two classrooms in each department; enclosing, draining, and tar-paving the additional land; providing new system of heating apparatus, etc. The plans also include the erection of a new laundry centre on arches (thus forming a covered playground underneath), to take the place of the existing building, which will have to be removed in order to provide the additional classrooms. The revised accommodation of the school upon the completion of the improvements will be: Boys, 438; girls, 438 infants, 496; total, 1,372; being a loss of twenty-nine places in the accommodation, which is occasioned by the necessity of reducing the length of certain classrooms so as to form corridors and halls, and the recalculation of other classrooms on the seat basis.

General Builders, Ltd.	£11,760	Spencer, Santo, & Co., Ltd.	9,617
E. Lawrance & Sons	10,252	Edwards & Medway	9,584
J. Simpson & Son	9,997	T. D. Leng	9,578
Martin, Wells, & Co., Ltd.	9,989	Hudson Bros.	9,569
Rice & Son	9,945	J. Carmichael	9,548
J. Garrett & Son	9,857	Lathey Bros.	9,289
Holloway Bros., Ltd.	9,835	W. Johnson & Co., Ltd.	9,247
E. Triggs	9,701	Stimpson & Co.*	9,210

Basnett-road Site, Lavender-hill, Arrangements for Erection of Separate Department for Forty Older Mentally Defective Boys, Manual Training Centre, etc.

The Board of Education, on December 30, 1903, approved the proposal to provide a separate department for the accommodation of older mentally defective boys, consisting of two classrooms for twenty children each, and a room for manual work, subject to the specific approval of the plans. The Board of Education, on the same date, also sanctioned the provision of a manual training centre for forty boys on this site to replace the existing centre at Gideon-road, Lavender-hill. Preliminary plans have now been prepared for carrying out these additional works, and the Committee recommended that, so soon as the Board of Education shall have approved the plans, instructions be given to Messrs. J. Garrett & Son to erect the proposed buildings (the cost of which is estimated at 3,852*l.*), on their contract schedule of prices for the physically defective school.

Middle-row School, Kensal New Town, for Sanitary and Drainage Works.

G. Neal	£3,018	Burn Bros.	£2,776
R. P. Beattie	2,864	F. Bull	2,729
G. Godson & Sons	2,855	Lathey Bros.	2,700
F. G. Minter	2,801	J. Peattie*	2,665

Victory-place School, Walworth: for Skylights, Fresh-air Inlets, etc.

Infants' School—Altering five skylights in the hall and classrooms B, C, D, and F; forming window in the cloakroom; providing Tobin fresh-air inlets, and foul-air extract ventilators to improve the ventilation. Boys' department—Providing a ventilating skylight in classroom C, and four Tobin tube fresh-air inlets in C and D rooms:—

E. Triggs	£290	W. Downs	£243
H. Groves	265	J. Marsland & Sons	237
W. V. Goad	252	J. C. Chalkley	196
H. Line	249	E. B. Tucker*	194
Maxwell Bros., Ltd.	245		

The interior work at the following schools will be executed between March 12, and April 9, and the exterior painting between March 12 and April 16:—

Edinburgh-road: Cleaning Interior and Painting Exterior.

General Builders, Ltd.	£319 0	S. Polden	£230 10
G. H. Sealy	308 0	F. T. Chinchen & Co.	218 15
W. Hornett	250 0	Bristow & Eatwell.	203 0
Holloway Bros., (London), Ltd.	236 0	W. Hammond*	196 10

†*Blundell-street: Painting Interior.*

Thompson & Beveridge	£540	G. S. S. Williams & Son	£444
H. Wall & Co.	459	Stevens Bros.	428
G. Kirby	458	C. Dearing & Son	399
Marchant & Hirst	446	H. Bouneau*	375

† In this case the work will be carried out between March 19 and April 16, 1904.

White Lion-street: Painting Interior and Exterior (old and new buildings).

Parrot & Isom	£687	McCormick & Sons	£456
A. Porter	601	W. Chappell	365
M. Pearson	570	F. W. Harris*	360

High-street: Painting Interior.

Vigor & Co.	£400	W. J. Howie	£340
W. Banks	398	H. Groves	305
P. S. Howard	349	W. Hayter & Son*	280
R. Woollaston & Co.	345		

Invicta-road: Painting Interior and Exterior.

Vigor & Co.	£448 0 0	W. Banks	£374 12 6
W. J. Howie	414 0 0	H. Groves	345 0 0
C. G. Jones	391 11 0	W. Hayter & Son*	312 0 0
R. Woollaston & Co.	383 0 0		

Nynehead-street: Painting Interior.

A. J. Acworth	£260 0 0	W. Banks	£219 17 6
W. V. Goad	227 0 0	T. D. Leng	215 0 0
E. P. Bulled & Co.	224 0 0	H. Groves	198 0 0

Rathfern-road: Cleaning Interior (Old Portion) and Painting Interior (enlargement).

W. J. Howie	£253 0 0	W. Hayter & Son	£190 0 0
H. Leney & Son	228 0 0	W. Banks	184 17 6
G. Kemp	218 0 0	C. G. Jones*	177 12 0
H. Groves	197 15 0		

Teesdale-street: Cleaning Interior.

A. E. Symes	£285 0 0	C. Willmott & Son	£208 0 0
W. Martin	241 0 0	Barrett & Power*	205 0
W. Silk & Son	229 16 0		
H. Bouneau	215 10 0		

Wolverley-street: Painting Interior and Exterior.

H. Runham Brown	£593 0	Woollaston Bros.	£482 0
C. Willmott & Son	562 0	A. J. Sheffield	469 0
J. F. Holliday	534 0	Barrett & Power	459 0
G. Barker	493 0	W. Silk & Son	441 0
Vigor & Co.	491 0	J. Haydon & Sons	402 8

Leo-street: Painting Interiors (all Buildings on Site) and Exteriors (all Centres).

Lathey Bros.	£579 0	Maxwell Bros., Ltd.	£479 0
Bargman, Son, & Co.	548 0	W. Hooper	459 10
Macey & Sons, Ltd.	535 0	W. Sayer & Son	409 0
G. Kemp	507 0	W. J. Howie	400 0
		E. Triggs*	384 0

"Latchmere:" Painting Interior (Boys, Girls, and Infants).

F. G. Minter	£493 0	E. Flood	£430 0
R. A. Jewell	487 0	R. E. Williams & Sons	380 0
C. Gurling	468 10	J. Garrett & Son	376 0
Rice & Son	453 0	R. S. Ronald	370 0
W. Johnson & Co., Ltd.	443 10	J. & M. Patrick*	340 0

New-road: Painting Interior.

W. King & Son	£534 0	Maxwell Bros., Ltd.	£459 0
J. R. Sims	480 0	Lathey Bros.	423 0
Edwards & Medway	478 0	R. S. Ronald	410 0
C. Gurling	475 10	E. B. Tucker	394 0
Rice & Son	462 0	E. Triggs*	362 0

Rosendale-road: Painting Interior and Exterior.

Lathey Bros.	£296 0	Maxwell Bros., Ltd.	£269 0
W. J. Coleman & Co.	280 0	H. Leney & Son	266 0
Holliday & Greenwood, Ltd.	277 0	W. J. Mitchell & Son	249 10
W. Read	277 0	H. J. Williams*	226 0

Bromley Hall-road (Iron Buildings): Painting Exterior of Three Buildings.

Parrott & Isom	£320	Woollaston & Co	£72
G. Barker	125	A. J. Sheffield*	62
Vigor & Co.	89		

Running Contracts for the Supply of Various Articles of Furniture.

	Map and Diagram Tables. Each.	Platforms. 4 ft. 6 in. by 6 ft. per section.	Platforms. 6 ft. by 6 ft. per section.	Steps. Each.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
H. Bouneau	6 12 6	*2 6 0	*2 16 0	*0 8 0
T. Cruwys	7 10 0	—	—	—
A. Duncan	5 15 0	—	—	—
Goodall, Lamb, & Heighway, Ltd.	—	5 5 0	5 12 6	0 12 6
R. Goodman & Sons	*2 15 0	—	—	—
G. M. Hammer & Co., Ltd.	6 14 0	—	—	—
London School Furniture Company	6 5 0	2 15 0	3 0 0	0 5 0
North of England School Furnishing Company, Ltd.	—	4 0 8	3 11 5	0 6 2
E. Spencer & Co.	—	3 6 0	3 12 0	0 7 0
T. Wallis & Co., Ltd.	6 19 6	—	—	—
S. J. Waring & Sons, Ltd.	8 5 0	4 8 0	5 1 9	0 9 6
Previous prices	5 7 6	11 4 0 each platform of 4 sections	10 4 0 each platform of 4 sections	0 9 0 0 5 0

The Supply of Linen Boxes.

General Builders, Ltd., North of England School Furnishing Co., Ltd.	each	£4 12 9
W. Brake & Co.,	"	3 5 4
T. Cruwys	"	2 10 0
S. J. Waring & Sons, Ltd.,	"	2 5 0
T. Wallis & Co., Ltd.,	"	1 18 6
G. M. Hammer & Co., Ltd.,	"	1 17 3
R. Goodman & Sons,	"	1 12 0
London School Furniture Co.,	"	1 10 0
W. Martin,*	"	1 9 6
	"	1 8 3

[Present price, £1. 9s. each. Existing contract expired on Feb. 27, 1904.]

LANGHO (Lancashire).—For the erection of epileptic homes, etc., at Langho, near Blackburn, first portion of scheme to accommodate 240 patients, for the Chorlton and Manchester Joint Asylum Committee. Messrs. Giles, Gough, & Trollope, architects, 28, Craven-street, Charing Cross, London:—

Pattinson & Sons	£83,499	0	0
A. White & Sons	83,030	16	9
W. Thornton & Sons	76,725	0	0
Armitage & Hodgson	75,633	0	0
H. Vickers, Ltd.	75,000	10	6
Shillitoe & Son	73,100	0	0
H. Vickers & Son	72,700	0	0
W. J. Bloxham	72,250	0	0
W. Storr, Sons, & Co., Ltd.	71,899	0	0
Gerrard & Sons	71,800	0	0
T. Rowbotham	71,000	0	0
Willcock & Co.	70,500	0	0
W. Thorpe	70,413	0	0
Whitaker & Sons	69,882	0	0
John Boland	69,600	0	0
John Knowles	69,500	0	0
John Tinline	68,995	0	0
S. & J. Smethurst	68,630	0	0
James Hatch & Son	67,385	0	0
Moss & Sons, Ltd.	66,639	0	0
Brown & Son	66,000	0	0
R. Neil & Son, Manchester*	63,950	0	0

NEW MALDEN.—For erecting cottage homes, for the Kingston Union Guardians. Mr. W. H. Hope, architect, Seymour-road, Hampton Wick:—

J. Scofield	£9,167	7	6
Mark G. King	8,386	10	5
West & Richards	7,990	0	0
Perry & Co.	7,890	0	0
Potter Bros.	7,890	0	0
S. E. Moss & Co.	7,683	0	0
Speechly & Smith	7,650	0	0
Goddard & Sons	7,610	14	0
C. E. Sims	7,595	0	0
Mussellwhite & Sapp	7,539	0	0
G. Gray	7,430	0	0
W. J. Renshaw	7,393	0	0
Waller & Co.	7,350	0	0
J. Longley	7,345	0	0
B. H. Davey	7,287	0	0
Robson & Moon	7,285	0	0
C. Oldridge & Sons	7,268	0	0
Jones Bros.	7,211	18	4
Cropley Bros., Ltd.	7,198	0	0
J. Hebblethwaite	7,070	0	0
C. W. Horton	£7,051	0	0
Johnson & Co.	6,988	0	0
J. Appleby & Son	6,975	0	0
H. Somerford & Son	6,964	0	0
W. A. Smyrk	6,954	16	8
G. Kemp	6,949	0	0
H. Collings & Son	6,907	0	0
McDonald Bros.	6,906	13	6
J. Ferguson & Co.	6,882	0	0
W. Smith & Sons	6,784	0	0
F. Hawkey	6,629	12	0
J. Barker & Co.	6,626	0	0
E. Fitt McCarthy	6,593	0	0
A. F. Mitchell	6,484	3	3
J. Burges & Sons	6,439	0	0
Mallett & Wood, Cardiff-grove, Luton, Beds*	6,304	11	0
B. E. Nightingale†	5,757	0	0

† Withdrawn.

NEW MALDEN.—For the erection of public offices, fire station, etc., for the Urban District Council of Maldens and Coombe. Mr. Wm. Hope, architect, Seymour-road, Hampton Wick:—

G. F. Havell	£6,830	8	9
D. W. Barker	6,657	0	0
McDonald Bros.	6,566	3	9
Cropley Bros., Ltd.	6,089	0	0
Foster Bros.	6,031	0	0
Buckingham & Son	5,980	0	0
General Builders, Ltd.	5,890	0	0
J. G. Kimberley	5,836	7	0
Higgs & Owthwaite	5,754	0	0
B. E. Nightingale	£5,647	0	0
F. G. Minter	5,576	0	0
Lane & Son	5,561	10	0
A. W. Robins	5,490	0	0
Oldridge & Sons	5,490	0	0
Gaze & Sons	5,427	0	0
McCarthy E. Fitt	5,257	0	0
Ferguson & Co.	5,167	0	0
Goddard & Sons, Dorking, Surrey*	5,000	0	0

PONTYPOOL (Mon.).—For heating apparatus, Congregational Church. Messrs. Swash & Bain, architects, Midland Bank-chambers, Newport, Mon.:—

T. Waller & Co.	£300	0	0
Werner, Pfleiderer, & Perkins	211	0	0
Coalbrookdale Co., Ltd.	207	0	0
J. Attwood	200	0	0
J. Jones & Son	169	15	0
J. Grundy	167	0	0
J. Williams & Sons	150	0	0
H. Hope & Sons, Ltd.	149	10	0
W. A. Baker & Co., Ltd.	146	0	0
J. Howarth & Co.	145	15	6
Tomlinson & Milan	145	0	0
Paragon Heating Co.	142	0	0
C. Seward & Co.	124	0	0
R. Alger & Sons, Dock-street, Newport, Mon.‡	122	0	0
Brearley, Horrox, & Co.	115	16	0
H. Ashworth	115	10	0
J. King, Ltd.	97	0	0
J. Jackson & Co.	92	0	0

‡ Low pressure system.

REDHILL.—For gate lodge at Redstone Hall, for Sir Myles Fenton. Mr. A. Waring Venner, architect, Redhill:—

R. Wallace & Sons	£419	W. Wickman, Reigate*	£348
A. B. Apted	389		
Saunders Geal	384		

TENDERS—*Continued on page 327*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums	Designs to be Delivered
Thirty Labourers' Cottages	Lurgan R.D.C.	.....	April 6
Infirmary for 70 Beds at Workhouse, Newall, Otley	Wharfedale Guardians	25*l.*, 15*l.*, 10*l.*	May 2
*Public Library	Borough of Stamford	25*l.*, 15*l.*, and 10*l.*	May 31

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Materials	Yardley R.D.C.	A. W. Smith, Engineer, Council House, Sparkhill, Birmingham	Mar. 19
Maintenance of Fire Alarm Installation	do.	do.	do.
Baths, Peel Park, Bradford	Bradford Corporation	F. E. P. Edwards, Cit. Arch., Whitaker-bdgs., Brewery-st., Bradford	Mar. 21
Roadwork, Oakdale-road	Wallasey U.D.C.	W. H. Travers, District Engineer, Public Offices, Egremont, Ches.	do.
Street Works	Manchester Corporation	Paving, etc., Dept. (Surveyor's Office), Town Hall, Manchester	do.
Road Materials	do.	Chief Clerk, Highways Department, Town Hall, Manchester	do.
Making up and Completing various Roads	Plymouth Corporation	J. Paton, Borough Engineer, Municipal Offices, Plymouth	do.
Repairs at Cemetery	Banbury Town Council	N. H. Dawson, Borough Surveyor, Town Hall, Banbury	do.
Parochial House at Terryglass	Rev. J. Darcy	Byrne & Son, Architects, 20, Suffolk-street, Dublin	do.
Villa, near Menai Bridge	.....	H. Thomas, Architect, Castle-buildings, Carnarvon	do.
Granite and Slag	Towcester R.D.C.	W. Sheppard, Surveyor, Towcester	Mar. 22
Materials	Burslem Corporation	F. Bettany, Borough Surveyor, Municipal Offices, Burslem	do.
Farmhouse, Woodleigh	Mr. E. B. Luscombe	Mr. Barrons, Weir View, Totnes	do.
Sewer Entries and Jobbing Works, etc.	Deptford Borough Council	V. Orchand, Town Clerk, Municip. Off., 20, Tanner's-hill, Deptford	do.
Making up Cambus-road and Carson-road	West Ham Borough Council	J. G. Morley, Borough Engineer, Town Hall, West Ham	do.
Broken Limestone	Caerphilly U.D.C.	A. O. Harpur, Surveyor, Caerphilly	do.
Repair, etc., of Highways	Sevenoaks R.D.C.	W. H. Bolt, Surveyor, Leigh, Tonbridge	do.
Two Villas at Llantwit Vardre	Mr. C. Griffiths	A. Bryant, Architect, Midland Bank Buildings, Pontypridd	do.
*Roadmaking and Paving Works	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
Road and Sewers, Horfield	.....	W. P. Saunders, Architect, Rupert-chambers, Quay-street, Bristol	do.
Four Houses, Ermington, Devon	Mr. J. Treneman	W. Harvey, Puttapool, Cornwood, Devon	do.
Materials	Oldham Corporation	E. C. Foote, Borough Surveyor, Town Hall, Oldham	Mar. 23
Whinstone and Slag	Easingwold R.D.C.	F. J. H. Robinson, Clerk, Easingwold	do.
Stores and Materials	Rotherham Corporation	Tramways Manager, Tram Depot, Rotherham	do.
Conversion of Premises in Wade-st. to a Public House	.....	Jackson & Fox, Architects, 7, Rawson-street, Halifax	do.
Stones and Chalk	Cosford R.D.C.	E. W. Veale, Surveyor, Bildeston, Suffolk	do.
Alterations, etc., Hospital Boiler House at Workhouse	Stoke-upon-Trent Guardians	A. P. Miller, Architect, Hanley	do.
Emergency Staircases & Balconies at Workho. Hosp.	do.	do.	do.
Cement	.....	J. S. Pickering, Borough Surveyor, Municipal Offices, Cheltenham	do.
Baptist Chapel, St. Thomas, Swansea	.....	W. Beddoe Rees, A.R.I.B.A., 37, St. Mary-street, Cardiff	do.
Lime	Rochdale Gas, etc. Committee	J. Leach, Town Clerk, Town Hall, Rochdale	do.
Tubes and Fittings	do.	T. Banbury Ball, at Gasworks, Dane-street, Rochdale	do.
Main Pipes and Specials	do.	do.	do.
*New Infirmary, etc., at Workhouse	Chipping Norton Union	C. Smith & Sons, 164, Friar-street, Reading	do.
*Wood-Paving, etc., Netherwood-rd. & Richmond-rd.	Borough of Hammersmith	Borough Surveyor, Town Hall, Broadway, Hammersmith, W.	do.
Extention of Engine & Boiler Houses at Elec. Wks.	Southend-on-Sea Corporation	E. J. Elford, Borough Engineer, Southend-on-Sea	Mar. 24
Granite and Road Material	Luton Town Council	Borough Surveyor, Town Hall, Luton	do.
Lavatory and Urinal at Cattle Market, Cross-lane	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	do.
Lime, Pipes, and other Stores	Carlisle Gas Committee	W. J. Smith, Engineer, Gas Works, Carlisle	do.
Road Macadam	Rhondda U.D.C.	W. J. Jones, Engineer, Public Offices, Pentre, Rhondda	do.
Broken Granite, Edging, etc., and Cement	Peterborough City Council	J. W. Walshaw, City Surveyor, Guildhall, Peterborough	do.
Broken Granite and Slag	Kesteven County Council	W. B. Purser, County Surveyor, 4, St. Peter's Hill, Grantham	do.
Small Villa Residence at Sandsend, Whitby	Dr. Tinley	E. H. Smales, A.R.I.B.A., 5, Flowergate, Whitby	do.
Public Conveniences under the Shambles	Burslem Corporation	Borough Surveyor's Office, Queen-street, Burslem	Mar. 25
Road Material and Carting	Guildford R.D.C.	J. Anstee, C.E., Council's Offices, Commercial-road, Guildford	do.
Temporary Schools, Mauldeth-road, Ladybarn	Withington U.D.C.	E. Woodhouse, Architect, 88, Mosley-street, Manchester	do.
Residence at Tuam	Rev. Dr. Healey, Arch. of Tuam	D. N. Morris, 68, Harcourt-street, Dublin	do.
One 500 Kilowatt Steam Generator	Stockport Gas and Electricity Com.	A. J. H. Carter, Electricity Works, Stockport	do.
Electric Lighting at Cardepot	Swindon Corporation	Lacy & Sillar, Engineers, 78, King-street, Manchester	do.
Machine Tools, etc., for Cardepot and Repair Shops.	do.	do.	do.
Warehouse at Union Mills, Halifax	.....	R. Horsfall & Son, Architects, 22a, Commercial-street, Halifax	do.
Stores on Pothouse Wharf, Carmarthen	Western Counties Agric. Co-op. Soc.	The Association's Stores, Pothouse-quay, Carmarthen	do.
Saleshop & Premises, Church-st. & Orchard-st., Shef.	Mr. C. L. Grundy	Gibbs & Flockton, Architects, 15, St. James's-row, Sheffield	do.
Presbytery at Loughglynn, co. Roscommon	.....	Canon White, Loughglynn	do.
*New Coastguard Buildings, near Plymouth	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
Road Material and Cartage	Repton R.D.C.	T. R. Sidgwick, Surveyor, Repton, Burton-on-Trent	Mar. 26
Dwelling Houses & Shops, Bloomfield-sq., Aberlow	J. Campbell	Mr. J. Jamieson, Architect, 51, High-street, Elgin	do.
Alterations, etc., Romsey Police Station	Southampton County Council	W. J. Taylor, County Surveyor, The Castle, Winchester	do.
Widening of Bridges	Northumberland County Council	J. A. Bean, County Surveyor, The Moot Hall, Newcastle-on-Tyne	do.
Street Works	Hadleigh U.D.C.	T. F. Corder, Surveyor, 115, High-street, Hadleigh	do.
Road Material	Wrotham U.D.C.	A. J. H. Powell, Surveyor, Borough-green, Sevenoaks	do.
Detached Villa at Omagh, co. Tyrone	.....	T. Houston, Architect, Kingscourt, Wellington-place, Belfast	do.
Station Buildings & Agent's House, Boat of Garten	Highland Railway Co.	W. Roberts, Engineer, Inverness	do.
Footpaths	Helensburgh Town Council	J. R. Wilson, Burgh Surveyor, Helensburgh, N.B.	do.
Exten. of Purifying H'se at Gasworks, Blackstoun-rd.	Paisley Gas Corporation	G. R. Hislop, Engineer, Paisley Gas Works	do.
Workmen's Lavatory and Stores	do.	do.	do.
Street Works, Sludge-lane, Wakefield	The Council	City Surveyor, Town Hall, Wakefield	do.
,,500 Yds. of c.i. Watermains, etc., Broxb'ne & Wormley	Ware R.D.C.	Bailey Denton, Lawford & Symons, Eng., 9, Bridge-st., W'm'ster	Mar. 28
Covered Service Reservoir	do.	do.	do.
Pumping Station, etc.	do.	do.	do.
Extensions to Goods-shed, Donegall Quay	Belfast Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast	do.
Materials	Clayton Le Moors U.D.C.	A. Dodgeon, Surveyor to Council, Clayton le Moors	do.
Paving, Sewering, etc., Sandy-lane, Dukinfield	Dukinfield Corporation	S. Hague, Borough Surveyor, Town Hall, Dukinfield	do.
School, Devonshire-street, Higher Broughton	Salford Education Committee	H. E. Stelfox, F.R.I.B.A., 6, Princess-street, Manchester	do.
Materials	Gateshead Corporation	J. Bower, C.E., Borough Engineer, Town Hall, Gateshead	do.
Annual Contracts	West Molesey U.D.C.	Surveyor, District Council Offices, East Molesey	do.
*New School in Devonshire-street, Higher Broughton	County Borough of Salford	H. E. Stelfox, F.R.I.B.A., 6, Princess-street, Manchester	do.
Annual Contracts	Sowerby Bridge U.D.C.	Engineer, Town's Buildings, Sowerby Bridge	do.
Alterations, etc., Welsh Cong'l. Chapel, Taff's Well	.....	G. L. Watkins, Architect, Station-terrace, Caerphilly	do.
Furnishing Isolation Hospital and Buildings, Tonteg	Pontypridd U.D.C.	P. R. A. Willoughby, Surveyor, Pontypridd	do.
Cloakroom, etc., at Gordon-road Council Schools	Stroud Education Committee	W. Banks, A.M.Inst.C.E., Guildhall, Rochester	do.
*Precipitating Tanks, etc., at Irrigation Land	Barnet U.D.C.	Council's Surveyor, 40, High-street, Barnet	do.
Roofing at Wapping Goods Yard, Liverpool	Lancashire & Yorkshire Ry. Co.	Engineer's Office, Hunt's Bank, Manchester	Mar. 29
Painting, etc., Hos., Whitmoor Common, Worplesdon	Guildford, etc., Hospital Board	A. J. Sturgess, Architect, 25, High-street, Guildford	do.
Road Material	Malling R.D.C.	J. Marshall, Surveyor, West Malling	do.
1,400 Yds. of Quartzite, Basalt, or Granite	do.	do.	do.
Furniture and Fittings, York-road Branch Library	Leeds Corporation	H. A. Chapman, A.R.I.B.A., Prudential-bldgs., Park-row, Leeds	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Street Works	Stanley U.D.C.	J. Routledge, Surveyor, Council Offices, Stanley	Mar. 29
Excavating and Refilling Trenches for Gas Mains	Glasgow Corporation	Mr. Wilson, Engr. of the Gas Department, 45, John-st., Glasgow	do.
*Extension of Telegraph Factory, Holloway	H.M. Works	H.M. Office of Works, Storey's-gate, S.W.	do.
*Three Cottages at Knowle Asylum, Fareham	Co. of S'th'mpt'n Asylum Vis. Com.	County Surveyor, The Castle, Winchester	do.
*New Coastguard Detachment, near Pembroke	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.	do.
Road Materials	Rushden U.D.C.	W. B. Madin, Engineer, Vestry Hall, Rushden, Northampton	do.
Leadwork for Provan Chemical Works	Glasgow Corporation Gas Depart.	A. Wilson, Engineer, 45, John-street, Glasgow	do.
Benzol and Carbolic Plant for Provan Chemical Wks	do.	do.	do.
Two-Track Plate Girder Bridge	East India Railway Company	C. W. Young, Secretary, Nicholas-lane, London, E.C.	Mar. 30
*Making-up Passage at Rear of Uxbridge-road	Borough of Ealing	Borough Engineer, Town Hall, Ealing, W.	do.
*Three Temporary Schools	K'gs Norton, etc., U.D.C. Edu. Com.	Sur. to the Council, 23, Valentine-rd., King's-heath, nr. B'm'ham	do.
*Erection of Wall at Prince's-road Workhouse	Lambeth Guardians	Clerk's Office, Brook-street, Kennington-road, S.E.	do.
2,000 Gallon Water-Softening Plant	Swindon Corporation	J. G. Griffin, Electricity Works, Swindon	Mar. 31
Llysfaen Sewerage and Water Works	Conway R.D.C.	T. B. Farrington, A.M.Inst.C.E., Trinity-square, Llandudno	do.
Rossett Police House	Denbighshire County Council	R. Lloyd Williams, County Surveyor, Denbigh	do.
Presbyterian Church, Whitehead	Building Committee	J. J. Phillips & Son, Architects, 61, Royal-avenue, Belfast	do.
Stores (Granite, etc.)	Smethwick Corporation	C. J. Fox Allin, Borough Surveyor, Town Hall, Smethwick	do.
Rubble Concrete Quay Wall, Anstruther	Union Harbour Commissioners	Engineer's Office, 5, High-street, Burntisland	do.
Malt. at K'kando-Glenl't Dis., Dalbeallie, Strathspey	.....	C. C. Doig, Architect, Elgin	do.
Retort House, Floor, etc., Liverpool-street Works	Salford Gas Committee	W. W. Woodward, Engineer, Gas Offices, Bloom-street, Salford	do.
*Disinfector-fit Drying Rms, etc., St. John's-rd., W'h'se	St. Mary, Islington, Guardians	Master of the Workhouse, St. John's-road, Upper Holloway	do.
Repair of Highways, Bicester	Bicester U.D.C.	H. J. Gibbons, Launton-road, Bicester	do.
Repairs to Bridge at Waterford	Hertford R.D.C.	J. W. Riggs, Surveyor, St. Elmo, Fanshawe-st., Bengeo Hertford	April 1
Wesleyan Church and Church Parlour, Urmston	.....	J. Jameson Green, Architect, 19, South John-street, Liverpool	April 2
Club Premises, Ewart-street, Great Horton	Working Men's Club	S. Spencer, Architect, Old Bank-chambers, Gt. Horton, Bradford	do.
5,661 Yds. run of 9-in. & 12-in. Stoneware Pipe Sewer	Sutton-in-Ashfield U.D.C.	Messrs. Beesley, Son, & Nichols, Eng., 11, Victoria-st., W'minster	April 4
316 Yards of Brick Storm-water Drains	do.	do.	do.
684 Yards of Stoneware Storm-water Drains	do.	do.	do.
Setts, Curbs, Flags, etc.	Middleton Corporation	W. Welburn, Borough Surveyor, Middleton	do.
Granite Setts	Shipley U.D.C.	W. H. Dawson, Surveyor, Shipley, Yorks	do.
Street Works	Sunderland Corporation	Borough Surveyor's Office, Town Hall, Sunderland	April 5
Raising Road, Chiddingstone Mill	Sevenoaks R.D.C.	W. H. Bolt, Surveyor, Leigh, Tonbridge	do.
Heating and Ventilating Maryhill District Library	Glasgow Corporation	A. Davie & M'Kim, Measurers, 219, St. Vincent-street, Glasgow	do.
Disposal of Sewage (Contract 4)	Worcester Corporation	T. Caink, City Engineer, Guildhall, Worcester	do.
Twenty-six Houses on Gorse Hill Estate, Stretford	Co-operative Society	Secretary's Office, Downing-street, Ardwick, Manchester	do.
Six H'ses at Provident-av., Barlow-rd., Levenshulme	do.	do.	do.
*Making-up Roads	Beckenham U.D.C.	Council's Surveyor, Beckenham	do.
*Road-Making, etc., at Grays, Essex	Kent & Essex Ho., L'nd, etc., Inv. Co.	G. W. Cobham, 1, Edwin-street, Gravesend	April 6
Sewerage Works (Pumping Station, Contract No. 4)	Derby Corporation	J. Mansergh & Sons, Engineers, 5, Victoria-street, Westminster	April 7
*Electricity Generating Station	Stepney Borough Council	Borough Engineer, 15, Great Alie-street, Whitechapel, E.	do.
New Church and Schools, Old Shoreham-road, Hove	.....	E. J. Hamilton, 2, New-road, Brighton	do.
*Extension of Electric Generating Stn., Walthamstow	Walthamstow U.D.C.	Council's Engineer, Town Hall, Walthamstow	April 8
Ballneety Bridge over the Colligan	Waterford County Council	County Surveyor, Waterford	April 11
Bartlhaels Bridge over the Nier	do.	do.	do.
Covered Reservoir in Crow Holes Wood, Cliviger	Burnley R.D.C.	S. Edmondson, Surveyor, 18, Nicholas-street, Burnley	do.
Socket and Spigot Pipes	do.	do.	do.
Road Metalling	Magor R.D.C.	I. Thomas, Clerk, Union Offices, Queen's Hill, Newport, Mon.	do.
*Painting & Cleaning Leavesden Asylum, Watford, etc.	M.A.B.	Office of the Board Embankment, E.C.	April 12
*Painting & Cleaning North-Eastern Hos., S. Tott'ham	do.	do.	do.
*Painting & Cleaning Eastern Hos., Homerton, N.E.	do.	do.	do.
*Alt. to Laundry-bldgs., East'n Hos., Homerton, N.E.	do.	do.	do.
*Alter'ns. to Eng. Arrangem'ts, East'n Hos., Homerton	do.	do.	do.
*Building Materials, Dartm'r, P'kh'st, P'tland Prisons	Direc. Con. Prisons, H.O., Whitehall	Prison Department, Home Office, Whitehall, S.W.	do.
Extension, etc., Newry Fever Hospital	Down County Council	R. MacIlwaine, Secretary to Council, Court House, Downpatrick	April 15
*Electricity Station Buildings	Loughborough Corporation	A. E. King, Architect, Baxter-gate, Loughborough	April 16
Pumping Machinery at Graving Dock	Belfast Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast	April 18
*Electricity Generating Station, Greenwich	L.C.C.	Arch. Dept., Highways Section, Trafalgar House, 13, Char.-cross.	April 26
140,000 Bricks, delivered at Guildford Station	.....	F. G. Minter, High-street, Putney, S.W.	No date.
Slag, Limestone, and Granite	Wortley Rural Highway District	F. Crawshaw, Surveyor, Loxley	do.
Five Houses in Allen-road	.....	G. Westcott, Architect, 11, King-street West, Manchester	do.
Painting Eleven Houses, Mill-street, Ancoats	.....	H. Sheldon, Architect, Middlewich	do.
Materials	Streets Committee, Bolton	E. L. Morgan, Borough Engineer, Town Hall, Bolton	do.
Four Houses at Tingley	.....	G. Sharp, Old White Bear, Tingley	do.
Monkhill Wesleyan Chapel and Schools	.....	H. Higginson, Architect, 3, Londsale-street, Carlisle	do.
Country House, St. James's Park Estate, Harrogate	.....	H. & E. Martin, Architects, Cheapside-chambers, Bradford	do.
Rd.-Making & Sewer. Wks., Bruce-grove, Tottenham	Gov. & Com. Inc. Soc. Licen. Vict's.	George Treacher, 73, Moorgate-street, E.C.	do.
Demolition and Removal of Old Buildings, Tottenham	do.	do.	do.
Pump, Half-a-Mile of Pipe, Cattle Troughs, etc.	.....	T. B. Mason, Beenleigh, Harbertonbord, Devon	do.
Vivian Hotel, Aberavon	Truman, Hanbury, Bux'. & Co., U.V.	J. P. Jones & Rowlands, Architects, 3, Goat-street, Swansea	do.
Winter Garden, Beamish Hall, Stanley	Mr. S. D. Eden	T. E. Crossling, Architect, Stanley, Co. Durham	do.
Three Dwelling-houses, Shield-row, Stanley	Messrs. Humble, Mann, & Gibson	do.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	Stafford Union	Not stated	Mar. 24
*Assistant Surveyor	County Borough of Croydon	150*l.* per annum	Mar. 26
*Road Foreman	Wandsworth Borough Council	3*l.* 10s. per week	Mar. 28
*Architectural Draughtsman	University College of North Wales	2*l.* 2s. per week	Mar. 31
*Clerk of Works	Chorlton, etc., Joint Asylum Com.	4*l.* 4s. per week	April 6
*Assistant Examiner in Office of H.M. Works, etc.	Civil Service Commission	Not stated	April 14
*Quantity Surveyor	Lambeth Borough Council	Not stated	No date.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*,

TENDERS—*Continued from page* 325.

REDHILL.—For alterations, additions, and redrainage works to Thornbank, Redhill, for Mr. Thomas Knight. Mr. A. Waring Venner, architect, Redhill:—

King & Son	£390	Saunders Geal, Reigate*	325
A. B. Apted	359	Wallace & Sons:	275

‡Withdrawn.

REDHILL.—For residence on Redstone Park, Redhill, for Mr. H. T. Brown, Croydon. Mr. A. Waring Venner, architect, Redhill:—

Nightingale & Sons	£1,192	Saunders Geal	£1,010
Buckland & Waters	1,170	G. Waycott	998
King & Son	1,150	R. Wallace & Son, South Merstham*	869
Bush & Son	1,080		
Elsey & Son	1,076		

REDHILL.—For residence on Earlswood-road, Redhill, for Mr. A. Montague Isard. Mr. A. Waring Venner, architect, Redhill:—

Wm. Scott	£775	0	0	A. B. Apted	674	0	0
E. Worrsell	743	0	0	S. Buckman	649	0	0
S. Geal	725	0	0	C. Carter, Redhill*	640	0	0
R. Wallace & Son	719	0	0	S. S. Pink	639	10	0
W. Wickman & Son	687	0	0				

RYDE (Isle of Wight).—For bungalow residence near Ryde, Isle of Wight, for Mr. Rolands Rivolta. Mr. A. Waring Venner, architect, Redhill:—

Henry Linington, Wroxhall, Isle of Wight* £1,000

SELLY OAK.—For making new roads at the workhouse, Selly Oak, for the Guardians of King's Norton Union. Messrs. T. B. Hall & Jones, engineers, King's-court, 117, Colmore-row, Birmingham:—

Abel Cooper, Rotton Park-road, Birmingham* .. £501

SOUTHALL.—For construction of a truck shed at the sanatorium, and for additions to fire station, for the Southall-Norwood Urban District Council. Mr. R. Brown, Engineer and Surveyor, Public Offices, Southall:—

For Truck Shed.

P. Bell	£99 0 0	A. & B. Hanson, Southall*	£78 0 0
W. Booth	95 1 6		
G. H. Lough	80 0 0		

For Additions, etc., to Fire Station.

W. Booth	£312 14 6	A. & B. Hanson*	£267 0 0
G. H. Lough	275 0 0		

[All of Southall.]

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SOUTHEND-ON-SEA.—For making-up Richmond-avenue, passage at rear of Westcliff-avenue, Bournemouth Park-road, etc., for the Corporation. Mr. E. J. Elford, Borough Surveyor, Southend.

	Chinchilla-road.	Richmond-avenue.	Bournemouth Park.	Back Passage.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Parsons & Parsons*	925 5 0	323 9	627 7 1†	70 1 0
R. Ballard, Ltd.	1,132 0 0	384 0 0	672 0 0	103 0 0
W. Iles	935 0 0	340 0 0	655 0 0	—
Buxton & Jenner	943 0 0	346 0 0	632 0 0	85 0 0
J. Summerfield	991 0 0	332 0 0	654 0 0	—
Surveyor's Estimate	964 0 0	280 0 0	639 0 0	55 15 6

SURBITON.—For the erection of waiting, cleaning, and storerooms, and coachhouses adjoining mortuary, for the Urban District Council. Mr. Samuel Mather, Surveyor and Engineer:—

E. Tomkinson	£440 0 0	McDonald Bros., Surbiton*	£382 0 0
Adkins Bros.	419 12 0		
R. Atkinson	378 0 0		

THORNHILL (Yorks.).—For the erection of administrative buildings at Bunker's Hill, Whitley-road, for the Urban District Council. Mr. S. W. Parker, Surveyor to Council, Thornhill:—

Mason:	Ellis P. Sheard, Thornhill*	£318 11 0
Slater:	W. H. Thompson, Batley*	37 15 0
Joiner:	J. Richardson & Sons, Dewsbury*	139 0 0
Plasterer:	Parkinson Bros., Heckmondwike*	47 7 0
Plumber:	J. Auty, Dewsbury*	56 0 0
Painter:	J. Warhurst, Thornhill Lees*	4 10 0

TONYPANDY.—For the extension of Trinity Hall, and for new class-rooms, etc. Mr. R. S. Griffiths, architect, Excelsior-buildings, Tonypandy:—

A. Richards, Pintre and Burry* .. £2,860 0 0

WALTHAMSTOW.—For car depôt. Mr. G. W. Holmes, A.M.I.C.E., Engineer:—

W. Whitford & Co.	£9,389	Mayoh & Haley	£8,160
Foster Bros.	9,297	Wellerman Bros.	8,080
D. R. Paterson	9,044	J. Westwood & Co.	7,575
Holliday & Greenwood	8,760	B. E. Nightingale	7,498
Myall & Upson	8,570	J. A. Reed	7,244
L. Whitehead & Co., Ltd.	8,517	W. Lawrence & Sons	6,997
J. C. Garbett	8,350	W. Jones & Son	6,991
Hughes & Stirling	8,202	F. J. Coxhead	6,918
Francis Morton & Co.	8,200	Rowley Bros., 462, West Green-road, South Tottenham*	6,610

WESTON-SUPER-MARE.—For the supply and fixing of 138 yds. of ornamental c.i. railing on the approach road to Knightstone, for the Urban District Council. Mr. H. Nettleton, Surveyor, Town Hall, Weston:—

H. Dyer	£219 0 0	Hillman & Sons	£134 16 8
J. M. Williams	190 0 0	J. Monk	130 10 0
Haward Bros.	179 0 0	J. P. Curtis, Weston-super-Mare*	129 18 10
F. C. Stephen.	140 0 0		
Leaver & Fox.	135 0 0		

WEYMOUTH.—For road works in connexion with Ilchester-road, Westham, for the Urban District Council. Mr. W. Barlow Morgan, Borough Surveyor:—

Glyn-avenue.

J. T. Whettam, jun.	£480 0	J. A. Bartlett, Rodwell Works, Weymouth*	£417 8
S. J. Smith	420 0		

Ilchester-road.

J. T. Whettam, jun.	£540 0 0
G. F. Bowring	514 10 0
J. A. Bartlett	496 15 6
S. J. Smith, Alexandra-terrace, Commercial-rd., Weymouth*	469 0 0

WHITEHAVEN.—For waterworks, for the Rural District Council. Mr. G. Boyd, C.E., 33, Queen-street, Whitehaven:—

Contract No. 1.

Staveley Coal & Iron Co., near Chesterfield* .. £796 12 6

Contract No. 2.

Martin L. Boundy, Braithwaite, via Keswick* 649 2 6

Two Screening Tanks at Hensingham, near Whitehaven.

Henry Kitchin, Corkickle, Whitehaven* .. £95

WHITEHAVEN.—For altering a building at Oak Bank into a dwelling-house, for Mr. R. Shaw. Mr. J. S. Stout, architect, 36, Lowther-street, Whitehaven:—

Builder:	T. Davidson, Parton*	£460 0 0
Joiners:	Jackson & Son, Whitehaven*	208 15 3
Plumber:	W. Stratham, Whitehaven*	100 0 0
Plasterer:	G. Gamman, Whitehaven*	96 0 0
Slater:	E. Burrows, Workington*	30 14 4
Painter:	R. Woodnorth, Whitehaven*	17 0 0

WOMBWELL.—For the erection of new chancel, organ chamber, and vestries, St. Mary's Church. Messrs. C. & C. M. Hadfield, architects, Cairn's-chambers, 19, St. James's-street, Sheffield. Quantities by Mr. Leon A. Francis, 8, John-street, Adelphi, W.C.:—

W. Johnson	£2,813 8 5	D. O'Neill & Son	£2,339 0 0
Chadwick & Co.	2,462 10 0	G. H. Smith Mexbro'*	2,316 6 0
W. Nicholson & Son	2,348 11 3		

WROXALL (Warwickshire).—For the erection and completion of a keeper's house, boiling house, kennels, and outbuildings at Wroxall, near Warwick, for Mr. J. Broughton Dugdale, J.P. Mr. Charles M. C. Armstrong, architect, 5, High-street, Warwick:—

E. Kemp	£1,100 18 6	C. Hope, jun.	£935 0 0
R. Bowen	996 0 0	E. Smith & Son, Kenilworth†	896 0 0
J. H. Cashmore	988 0 0		
E. Talliss	979 0 0		

† Provisionally accepted.

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The Builder.

VOL. LXXXVI.—No. 3190. MARCH 26, 1904.

ILLUSTRATIONS.

Suggestion for an Imperial Monumental Hall and Tower at Westminster ..... By Mr. J. P. Seddon, F.R.I.B.A., and Mr. E. B. Lamb.
Ditto: view from below Westminster Bridge ..... Drawn by Mr. E. B. Lamb.
Design for a Fireplace ..... By Mr. Herbert Raine.
House, Sloane-street ..... Mr. R. G. Hammond, Architect.

Illustrations in Text.

Christchurch Harbour. Figs. 1 and 2 ..... Page 330
House at Sloane-street. Plans ..... Page 339
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The Institute and Fellowship.

THE record in the *Journal* of the Institute of Architects of the discussion at the special general meeting at the end of last month, which was in an official sense a private meeting, is rather depressing reading for those members who are concerned for the welfare and dignity of the Institute.

The discussion we refer to was one which arose on the Fellowship question, in reference to two resolutions of which notice had been given, and which were moved from the chair. The first one concerned the alteration of the by-laws necessary to provide that after December 31, 1906, everyone desiring to become a Fellow shall be required to have passed the examination qualifying him to be an Associate, or should be elected from the class of Associates, leaving the Council power to dispense with such examination under special circumstances. This legislation was, of course, inevitable in the long run, for it could not be expected that those who had passed an examination to become Associates would contentedly see men, perhaps not much older than themselves, but who could show the required period of practice on their own account, passed into the higher grade of membership without an examination. That is all plain sailing; the doubtful, or more than doubtful, element came in with the second resolution, which shall not be quoted here as originally proposed, since it is better that its terms should not be known beyond the circulation of the Institute *Journal* among members. It is sufficient to say that the effect of this extraordinary resolution was that everyone eligible as a Fellow had better be incited to join the Institute in the meantime, before the doors were barred by an examination, and that it had better be made as easy as possible for them to do so; and this purport was expressed with a simplicity and directness which took away one's breath. A resolution more damaging to the credit of the Institute we can hardly imagine, nor can we understand how the Council could be so short-sighted as to propose it in the terms they did. After various proposals in the course of the discussion, it was finally passed in this form: "That during the intervening period every architect eligible under the Charter for election who desires to join the Institute as a Fellow should be encouraged to do so."

This, though a great improvement on the crude form in which the resolution was first proposed, and which is better forgotten, still practically means the same thing—viz., that the Council are anxious to increase the number of Fellows, and that they propose to make their election as easy as possible in the interval between now and the institution of the examination test. To have passed such a resolution even in that modified form seems a very strange and unadvisable confession of weakness; nor is it likely to attract any but an inferior class of men. These, if they think it desirable to have "F.R.I.B.A." after their names, will no doubt be glad to take advantage of this interim of promised benevolence; but men of a superior order will hardly feel much disposed to apply for membership during a period when it has been plainly implied that Fellows are much wanted and that election will be made easy for them!

The origin of this ill-advised resolution seems to have been an impression that the Council, in requiring those who sought election as Fellows to submit drawings and photographs of executed works, had exercised a kind of closure against people who were eligible under the Charter, but whose designs did not please them. As far as we have been able to ascertain, there is not much ground for this idea; some applications have, we believe, been refused because the drawings accompanying them were of such a kind that it was not thought creditable that the author of them should be allowed to become a Fellow of the Institute; but we gather that they were rather extreme cases. Some eminent architects were very anxious at one time that the election as a Fellow should be, like election as a Royal Academician, a kind of testimony of superior talent; but we do not think that is practically workable or suitable to what is after all a professional society. Fellowship ought therefore to follow on a certain standard of professional position, but it is quite right it should be in part dependent on the quality of work done, and that the Council should be at liberty to refuse an applicant whose designs are of a standard which would discredit the Institute, even if his position was in accordance with formal regulations. They will hardly raise the status of the Institute by abandoning this wholesome practice.

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CHRISTCHURCH HARBOUR.

THE vagaries of the sea are well illustrated by the changing outlines of the coast, especially on the eastern and southern shores of Great Britain. Sometimes eating away land that can ill be spared, at others piling up shingle and sand where they are not wanted, profiting always by the negligence or folly of man, seeking persistently and relentlessly to undermine his protective works, and setting at naught the efforts of the map maker, the sea works its will with our little island.

A curious example of the way in which the sea disregards the rights of landowners and the interests of those engaged in the fishery industry is to be found at the present time in the neighbourhood of Christchurch. In former times the shingle travelling along Bournemouth Bay was arrested by the promontory known as Hengistbury Head, which, with the Beerpan Rocks extending seaward, formed a natural and most efficient groyne, and collected two extensive mounds of shingle on the west side, which extended as far as Double Dykes. But the eye of covetous man was set on the ironstone which occurs in seams of between 3 ft. and 4 ft. in thickness at the base of the cliff. Large quantities were taken away, and between the years 1847-1854 some 400 ft. of rock was removed.

After the demolition of this groyne the two mounds of shingle began to disperse and to move round the headland to the spit at the western side of Christchurch Bay. Behind Hengistbury Head, and sheltered by it from the south-west winds, is the entrance to Christchurch Harbour. Only the south-west side is thus protected, for the high land soon gives way to sand dunes stretching to the Haven at the outflow of the two rivers, the Stour and the Avon. The sand spit at Hengistbury, reinforced by shingle drifting round the point, has been extending for years past, and has now grown out for a length of more than one and a half miles in a north-easterly direction across the former mouth of the harbour, so that the entrance is no longer in the position shown in most of the maps available for reference, but between the elongated spit and another sandbank projecting from land on the other side. The spit is fully a quarter of a mile wide near the headland, and upon it sandhills have accumulated to a height of between 20 ft. and 30 ft., and even the narrower part of the spit is well above the high-water level of spring tides. Fig. 1, reproduced from a map dated

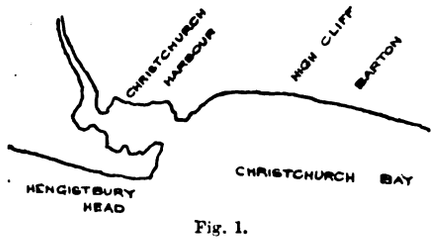

Fig. 1.

1858, indicates the general outlines of the harbour about thirty-five years ago, and Fig. 2, taken from Mr. Wheeler's work on "The Sea Coast," gives some idea of the conditions prevailing a year or two back.

But the sand spit at the mouth of the harbour continues to grow, and has extended half a mile within the last few years. What used to be the seashore at Mudeford has been transformed into the bank of a freshwater river, the opposite

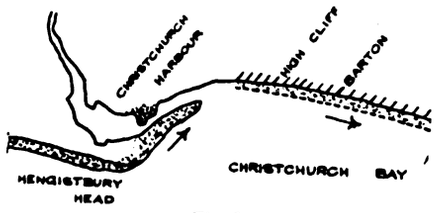

Fig. 2.

side of which is formed by a long sandbank rising 5 ft. or 6 ft. above sea level and measuring 50 yards in width at its narrowest point. The arrows in Fig. 2 show the direction of the littoral drift, and it is tolerably certain that but for the action of the river the harbour would have been closed up long ago, as happened at Pagham Harbour; but the river has been unable to prevent the formation of a bar at the mouth, which renders navigation well-nigh impossible even for fishing boats. At Christchurch, however, the scour of the river has prevented the sand from collecting along the beach to form an extended foreshore. Tidal action on one side, and the action of the river on the other, conduce to lengthen the sand spit, the tides driving the sand towards the harbour mouth and the stream forcing it forward in the effort to gain access to the sea.

The effect of the ever-growing sandbank is sufficiently serious to various classes of the community in the neighbourhood. All around the town of Christchurch meadows are flooded, roads are submerged, and the river channels are indistinguishable, for the water cannot get away with sufficient rapidity, owing to the obstruction at the harbour mouth. The bar which has formed at the mouth of the harbour makes it a matter of difficulty for the fishermen of Mudeford to get their boats to sea.

At the foot of the cliffs above the bar the old foreshore has been cut out by the scour of the river, the cliffs are being undermined, and a landslip is seriously feared.

The position is singular in more than one respect. In the first place there is the unusual spectacle of two foreshores at Mudeford, one on the original coastline and the other along the outer boundary of the sand spit. Summer visitors to the coast have found the shore converted into the bank of a river, and sea-bathing is now possible only from the spit. Next, it seems difficult to suggest a remedy for the existing blockade, not so much from an engineering standpoint as from considerations of legal character. If the bank were cut through, landowners might be in a position to demand recompense for any injury done to their property or to cover the cost of protective works. There are various other rights and privileges connected with the river and the harbour that must be respected. Knowledge of these checks private enterprise, and there does not appear to be any public authority with adequate power for dealing with the problem.

The present condition of the harbour is not altogether unprecedented, for it is said that there have been similar extensions of the sand spit in former times, and that in each case the obstruction was broken through by natural agencies. The duration of the bank on previous occasions has been about twenty years, and there is a hopeful impression that the present bank may be dissipated at no distant date. A sudden outpouring of the river, a high spring tide, and a violent gale from the south-west might certainly combine to break up the spit, but it would be much more businesslike if the authorities and other persons concerned could agree to invoke the aid of a competent engineer with the object of raising the existing blockade, and of taking such measures as a careful examination of the local conditions might show to be required for preventing a recurrence of the present trouble.

FLOODS AND THE LONDON MAIN DRAINAGE.

THE exceptional rainfall of last year was the cause of many floods in various parts of the country, and it is not surprising that certain districts in London suffered on more than one occasion. During the four months June to September the London County Council received more than a thousand complaints of floodings from local authorities and from the owners and occupiers of property, and in all probability those who took the trouble to write to the Council represented only a small proportion of the total number of persons who were injuriously affected by the excess of storm-water. On July 23 the abnormal rainfall of 3·59 in. was recorded at one of the London pumping-stations, and throughout the summer storms recurred at such frequent intervals that on several occasions the water had not subsided in the sewers after one storm before another downpour came. Obviously the excessive rainfall was the primary cause of the floods, but there were also secondary or contributory causes to which attention should be drawn. Many basements have been constructed at such a low level in relation to the sewers that it is impossible to drain them properly, and when the sewers are fully charged the combined storm-water and sewage rises through the drains and floods the basements. Property-owners themselves are in many cases to blame for these mishaps; in order to obtain a lofty story below ground they have deliberately run the risk of having it flooded. The sewers cannot be lowered to suit the convenience of a few individuals, and if they object to the floods they ought not to object to bear the expense of making their basements watertight. On the other hand, they may fairly claim that the public authority ought to take such measures for dealing with storm-water that the normal flow of sewage is not interfered with; it is one thing to be flooded with storm-water, but quite another thing to be flooded with foul sewage.

This brings before us another of

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the contributory causes to which we have referred. For good or ill, the sewage and surface-water of London are discharged into the same conduits, and, while the sewers are of sufficient capacity to carry off the sewage, many of them are not large enough to take also any great quantity of surface-water. This is the crux of the problem which the London County Council is called upon to solve. There can be little doubt that the separate system of sewerage would be the best for a great city situated as London is; it would go a long way towards preventing the flooding of basements with sewage, and would simplify the treatment of the sewage at the outfall-works. But the cost of a second system of sewers would be so enormous that even those Councillors who think imperially would not venture to advocate that it should be undertaken. Old cities have their disadvantages, and London is a conspicuous example. Narrow and inconvenient streets, a defective water-supply, inadequate sewerage, vested interests of every kind, are part of the burden which the past has laid on the back of the present; they are like the heavy debts for which the heir becomes responsible when he succeeds to his thriftless father's property. Up to the year 1815 no sewage was allowed to be discharged into the streams of London; these were reserved for surface-water, and cesspools were used for the reception of sewage. But in 1847 the great mistake was made; an Act of Parliament was passed, and houses were drained into the streams which discharged into the Thames. The streams became so foul that their natural channels were gradually replaced by brick culverts, and the combined system of sewerage was thus initiated. Later works, including the great intercepting sewers of Sir Joseph Bazalgette, have merely extended the system, which, we fear, it is now unfortunately too late to alter.

A third contributory cause of floods is the growth of London and the rapid covering of the natural surface of the ground with buildings and impervious paving. Year by year the sewers receive an increased quantity of sewage and a greater proportion of the rain which falls in the County of London, and it is evident that many of the sewers are now too small to carry off with sufficient rapidity the storm-water and sewage draining into them.

The London County Council has had this problem constantly before it. Since the Council was constituted in 1888 nearly nineteen miles of new relief-sewers have been laid, in addition to sewers which form part of the general extension of the system, and nearly two millions have been spent on these new sewers and on pumping-stations and other works for the prevention of flooding. In December 1899 the Council adopted without a division a scheme submitted by the Main Drainage Committee for the enlargement of the main drainage system, at an estimated cost (in round numbers) of 3,000,000*l*., and one-third of this work is either completed or in progress. In addition to the works included in this scheme, the Committee recently submitted to the Council a report containing suggestions for other relief-works, the cost of which is roughly estimated at about three-quarters of a million, exclusive of the cost of acquiring sites for new pumping-stations and outlets into the Thames. At present, however, the Committee merely asked for power to spend 5,000*l*. in the preparation of plans and for other incidental expenses in connexion with the work, and their request was granted.

The report, which is dated February 4, 1904, describes some of the more important works which appear to be urgently required. The first is a new relief-sewer from Holloway-road to the River Thames, the total length being over four miles, and the estimated cost, exclusive of the outlet, 250,000*l*. This sewer will discharge by gravitation into the Thames at all states of the tide; it will receive the storm-overflows from certain existing sewers and from the new middle-level sewer which forms part of the scheme for the extension of the main drainage system, and will, it is believed, prevent the floodings which have so often occurred in Mare-street, Hackney, and less frequently in the area between King's Cross and Blackfriars Bridge. A new sewer is also included for the prevention of floodings in the neighbourhood of Stroud Green-road and Blackstock-road, Stoke Newington; but this is a comparatively small matter, the estimated cost being only 25,000*l*. Nearly three times this amount is required for the extension of the Hackney Wick relief-sewer, in order to improve the drainage of the north-eastern part of Hackney, including Upper and Lower Clapton. In the West it is proposed to construct a new sewer, at a cost of 20,000*l*., to take the storm-water from the middle-level sewer near Notting Hill to the Counter's Creek sewer, which runs to the new pumping-station at Lot's-road, Chelsea. By this and other works relief will be afforded to the districts of Fulham, Hammersmith, Kensington, Chelsea, and Paddington.

South of the Thames, in addition to the new sewers included in the scheme for the extension of the main drainage system, it is proposed to construct two new pumping-stations in Wandsworth and Southwark, at a cost of 230,000*l*., exclusive of the sites, etc. With reference to the floodings in Loampit Vale, the Committee makes no recommendation, as it has not yet been able to come to an agreement with the Metropolitan Borough Council of Lewisham. The sum of 75,000*l*. is included for smaller relief-works north and south of the Thames, but details of these are not given.

That these works when completed will do much to prevent floods there can be no doubt, but it is evident that some time will elapse before they are even begun. The plans have not yet been prepared, and the Committee will have to submit another report with revised estimates before the Council's sanction can be asked or obtained for the commencement of the works. The Stock Exchange does not at present regard municipal loans with much favour, and the Finance Committee of the Council is evidently averse from asking the Council to commit itself to the expenditure of another million for drainage-works, unless retrenchment is practised in other directions. In commenting on the report of the Main Drainage Committee, the Finance Committee "feel it to be their duty to again refer to the fact that the present and prospective financial conditions tend to show that the provision of funds to meet the Council's heavy commitments will be a difficult operation, and that the larger the amount which the Council may find it necessary to raise the higher will probably be the price to be paid for it." The suggestion is then thrown out that it may be necessary "to take into serious consideration the postponement of the carrying-out of other schemes which may not be of such an urgent character as that now submitted by the Main Drainage Committee." To which suggestion the great majority of ratepayers will probably hope that good heed will be given.

NOTES.

Water Power. REFERRING to our recent remarks upon the utilisation of water for power purposes, we may call attention to the action of the French Government in this respect. After careful inquiry, that Government published a report showing the entire water power available throughout the country, with the result that a very large impetus has been given to local industries. In a pamphlet issued by the Minister for Industries it is stated that, whereas the last century showed the destruction of the individual worker and the concentration of mechanical power, the new century has opened with the dissemination of power and the bringing back of work to the homes of the people. In the neighbourhood of Lyons a whole mountain-side has been filled up with separate cottages, each occupant having supplies of electrical energy from the city and being engaged in making fabrics that were formerly produced only in large factories. We are quite aware that Great Britain does not possess such facilities for the production of electricity by water power as are to be found in some parts of France, but it is quite certain that the natural advantages evidenced in many parts of England, Scotland, Ireland, and Wales might be much more fully utilised than they are at present. The subject is one of the utmost importance, and deserves the serious attention of those who desire to aid the progress of industry and to bring the people back to the land.

Landlord v. Tenant. IN our issue of August 15, 1903, we commented upon the case of Harman *v.* Ainslie, in which Mr. Justice Wright decided that a proviso in a lease, giving the landlord the right to re-enter upon the premises on breach of any covenant to be performed by the tenant, did not apply to a breach of a negative covenant, such as covenants not to sublet or covenants not to carry on a particular trade upon the premises. The ground of this decision was that a negative covenant could not be one "to be performed" by the tenant. The Court of Appeal have now reversed this decision, holding that the word "performance" means the observance of an obligation and

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covers both classes of covenants. This judgment is satisfactory, for the former decision only would turn on the omission of the word "observe" in addition to "perform," which is usually found in clauses in leases dealing with forfeiture. It is curious that this question should have remained in uncertainty until the present day, although it has often been discussed, and the decision of the Court below was based on a very old case, which decided such a clause could not apply when the right to entry was given if a tenant made default in a covenant "after thirty days' notice" and the tenant had made some alteration in the structure, since the landlord was hardly likely to give a thirty days' notice not to alter the structure.

The Private Sidings Bill.

THERE are several questions which were dealt with and, it was fondly hoped, finally settled, by the legislation of a few years back, which are still a fruitful source of controversy and litigation between railway companies and their customers. One of these matters—in which some of our readers are doubtless interested—is the liability of railway companies with regard to private sidings; and this subject occupied the attention of the House of Commons last week. Several actions, brought at the outset to secure rebate for "terminal" services and accommodation, have turned on the question of the "reasonable facilities" which railway companies are supposed to give in connexion with the construction and maintaining of private sidings. It would appear that the present state of the law on this subject is so uncertain and indefinite that even experts like the Railway Commissioners have had their decisions reversed by the Court of Appeal. This has occurred both in England and Scotland, and in these circumstances a bill has been introduced by the representatives of the sidings owners in the House of Commons, with a view to defining the rights of traders and the obligations of railway companies. The bill was read a second time on Friday last week, and referred to the Standing Committee on Trade; and Mr. Gerald Balfour promised, on behalf of the Board of Trade, to give impartial consideration to any amendment which might be suggested by the traders or the railway companies. Although a measure of this nature attracts but little public attention, it is calculated to prevent a great deal of disputing and litigation. But, judging from the small measure of success which has attended past efforts in the same direction, the "definitions" must be exceptionally clear and unmistakable.

Drain or Sewer.

MR. JUSTICE CHANNELL had before him in the case of Heaver's Executors *v.* Mayor, etc., of Fulham this week the old vexed question of "drain" or "sewer." Two houses had been built by the same owner, and the drain of one of them carried away the water from the sink of the other. It was contended that this junction made the drain a "sewer." The Judge, however, found that this system of drainage had been duly carried out with the sanction of the local authority under section 76 of the Metropolis Management Act, 1855, and therefore that the drain remained a drain by virtue of section 250 of that Act, being "a drain for draining any group or block of houses by a combined operation under the order of a vestry or district board." Other points were raised in the case which might seem in conflict with former decisions—for instance, it was suggested that the sinks might have been connected subsequent to the time the houses were erected and without authority; but the Judge intimated that since the houses remained vested in the family of the deceased the owners could have no higher rights than he had, and this would distinguish the case from Kershaw *v.* Taylor, commented upon in our issue of June 27, 1903. Again, a question was raised as to whether rain water was not led into the drain also from the other house, which might have made it a sewer (as in the case of Silles *v.* Fulham Borough Council, commented upon by us April 25, 1903), but, although the Judge discussed this question, he refrained from giving any express decision. We trust these questions will all be simplified in the promised Bill on the subject of the Public Health Acts.

Flats.

FROM the recent report of the Middle-Class Dwellings Company and other sources of information, it appears clear that there is a "slump" in flats. We may, therefore, expect to see a temporary cessation of the building of this particular form of habitation; indeed it is very likely that the small house will again be returned to by the builder. Flats, unquestionably, have many useful points, but they are not as a rule suitable for families. Hence the moment that the bachelor, the spinster, and the single couple found that the supply of flats was becoming abundant rents began to fall. Builders, in fact, forgot that flats are only a limited market, and the preposterously high rents have also caused economically-minded persons to rent or purchase small houses, which, if they have not fallen, have not risen in annual cost. In other words, the individual house owner has been able within the last twelve months to compete successfully with the proprietors of flats. These proprietors are often limited companies, and, therefore, we may expect to see a considerable reduction in the rent of flats during the next year or two. For rent must go down to obtain tenants, otherwise no dividends will be payable.

The Coal Smoke Abatement Society.

THE Coal Smoke Abatement Society, as reported on another page, held its annual meeting on the 22nd inst. at Stafford House. Sir William Richmond was in the chair, and moved the adoption of the report. Sir Thomas Barlow spoke strongly on the injurious effect of the smoky atmosphere not only on our bodies, but on all our surroundings. A vast sum of money is being spent annually by Londoners in cleaning and painting their houses; one of the speakers said he had made a rough calculation, and it amounted to certainly not less than 2,500,000*l.*, probably more. The Society has already done good work, and has the sympathy of the London County Council, the Office of Works, and the City Corporation, but it is sadly hampered by want of funds. Sir William Richmond made an appeal to the large audience, begging them to enrol themselves as members or get others to do so if they already belonged to the Society. The subscription is only 5s., though donations of larger sums are much needed.

Victorian Institute of Architects.

WE noticed in our last issue the newly-issued *Journal* of the Institute of Architects of New South Wales, and the article in it on the architecture of Sydney. The January number of the Journal of Proceedings of the Victorian Institute of Architects contains a paper on "The Streets of Melbourne from an Architectural Point of View," read by Mr. W. M. Campbell, Associate, before a meeting of the Institute in October last year. The author sketches concisely the history of the city, the character of the site when selected, and the reasons for its selection, and makes some good suggestions in regard to the most effective way of treating city architecture. We quote the following in regard to the general principle on which Melbourne was originally laid out:—

"Some two years after the landing of the first settlers in August, 1835, the place had grown to such importance as to necessitate its being properly surveyed, and laid out on some definite plan. This was done by the Government surveyors, Messrs. Hoddle and Russell, at the instance of Sir Richard Bourke, Governor of N.S.W., who himself visited the young settlement. The area included in this plan was inclosed by Spencer-street and Spring-street, Flinders-street and Lonsdale-street, and was virtually the plan we now have of that block. It consisted of a rectangle, divided by its intersecting streets into rectangular blocks. A fine breadth of 99 ft. was given to the main streets, but want of foresight was shown in reducing the width of the secondary streets. These latter were originally intended as back entrances to the yards and gardens facing the main streets—a purpose which they have long ceased to serve. The plan adopted has the advantages of rectangular building blocks, simplicity and economy of space, but gives a monotonous and uninteresting appearance to the city. There are none of these odd corners and irregular spaces, which suggest to public spirited citizens donations of fountains and statuary. There are no oases of grass and flowers, trees and shade; no seats or restful places, in soothing contrast to the bustle of the city. Everything is mathematically true and square. The perspective lines of the streets run away into indefinite distances without break or satisfactory ending. The general trend of expert opinion on city planning is now against this gridiron plan, as it is sometimes called. Points of interest, open areas, diagonal and curving roads, are considered desirable in the city plan. Washington, planned like a wheel, Paris a constellation of stars, Vienna a central block containing most of the principal buildings, encircled by park-like boulevards, are the types which have had most influence on recent city building in the old world."

"The Light of the World."

AT the Fine Art Society's Gallery is to be seen Mr. Holman Hunt's replica, life-size, of his celebrated picture "The Light of the World." The causes which are said to have led to the repainting of the subject are sadly indicative of the narrow sympathies of English people, and religious people more especially, in regard to art. The original picture was presented to Keble College, the authorities of which do not seem to have recognised its value as a work of art unique of its kind, and allowed it to hang in the library near a hot flue, by which the picture was practically ruined. There appears to have been

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something about its symbolism also displeasing to their theological views, as it was afterwards hung in an out-of-the-way position in Keble Chapel; though we observe that the Warden of Keble, in a letter in Thursday's *Times*, denies the impeachment. We have always been of opinion that the public enthusiasm about this picture was as much religious as artistic; but nevertheless it was a remarkable and memorable work, and it is much to be regretted that it should have fallen into the hands of people who could not understand its value or take proper care of it. The new version, besides the altered scale, differs in several points from the original, and unhappily in a manner that is not an improvement. The expression of the head is different and much less pathetic, and in the original there was a strange mystery of colour about the garment which seems to have escaped in the new version. It was very good of the artist to try to revive it, but if he had endeavoured to produce an absolute replica the same size as the original we should probably have been nearer to getting back what Keble College has destroyed. The picture was exhibited in a room to itself at the Fine Art Society, people sitting solemnly in a row before it as if they were in church, which appears to be the orthodox method of receiving one of Mr. Hunt's pictures on religious subjects.

The Institute of Water Colours.

THE present Exhibition of the Institute of Painters in Water-Colours is a curious combination of some really beautiful works, which we look at for their own sake; others of which the subject seems interesting, and one turns up the catalogue to see what it is about; and others (a good many) which are interesting in neither sense. The best landscape in the collection is Mr. Weedon's "Fittleworth Common" (6); all his exhibits are examples of true and unpretentious landscape painting. There are other—much larger—works, such as Mr. Bernard Evans's "Fountains Abbey" (75) and Mr. Severn's "Sun Effect near Kilkee" (129), which are what we call scenic effects, powerful as such, but not nature. Among other landscapes to be noted are Mr. F. G. Cotman's "The Last Load" (49); Mr. Reginald Jones's "The Mill on the Avon" (43), very good in the colour effect of the old buildings; Mr. Haité's sketch of "A Shady Lane" (182); Mr. Rainey's "A Woodland Scene" (200), Mr. John Reid's bright bit of sea in "Fishing with Grandfather" (324); Mr. David Green's "After the Storm" (371), an admirable beach scene, everything balanced and in unity; and Mr. John White's "Sea-weeders" (380). Among figure pictures is a life-size one by Mr. Lee Hankey, "Nothing to Sell" (305), which is the kind of art we abhor—a cheap sentiment picture of a starving man seated on a bench somewhere in London; disagreeable in colour and commonplace in idea, and with an apparent secondary meaning in its title which is not a nice one. There is no figure picture of the first order of interest; but there are clever pieces of humour, such as Mr. Steer's conception of Dick Swiveller and the Marchioness (210), poor in colour, but an excellent realisation of Dick; Mr. Frank Dadd's young soldier, "When I First put this Uniform On" (243); and Mr. Clifford's "One of Nelson's Men," a wounded middy parading the Thames side at Chiswick with his mother; both figures and landscape interesting. Mr. Gotch's half-length under the title "Amber and Black" (271) is a good piece of colour, which cannot be said of Mr. Sainton's "A Golden Harmony" (332), though the face of the figure floating in this yellow atmosphere is beautifully painted; so also is the nude body of the same artist's "Dryad" (376), an undressed figure (not a nymph) seated by a brook; a capital bit of painting, but the head is surely rather too large. A kindred subject, very prettily designed and good in colour, is Mr. G. H. Edwards's "The Message." Mr. Dudley Hardy has a very interesting subject in "In Time of War" (288), the margin of an English harbour with one of those towering, gilded, high-masted line-of-battle ships of the old glorious days waiting for the last of her crew; a work of which one may quote the old critical formula that "the picture would have been better if the painter had taken more pains."

The Woodbury Gallery.

SOME pictures, drawings, and studies by the late gifted brothers Henry Moore and Albert Moore are on view at the Woodbury Gallery in New Bond-street. The most interesting things in the Albert Moore collection are some of the small studies for figures and drapery, Nos. 18, 20, 21, and 23 especially. But the works by Henry Moore are the most valuable portion of the exhibition. The versatility of the artist, who was known to most people only as a sea-painter, is shown by some inland landscapes and a painting of flowers which reminds one rather of M. Fantin-Latour. But the studies of sea make the strong point of the exhibition. "In the Portland Race" (40), an almost rough sketch, is a splendid record of the impression of these "still-vexed" waters; "The Jersey Packet off Sark" (45), dimly descried in the distance across a waste of dark water, is equally fine. Moore always put the shipping at a distance in his sea pieces, because for some reason he would not take the trouble to study ships properly, and never felt at home with them. Other excellent pictures in this part of the collection are "Early Morning off Penzance" (46), "Off the Hampshire Coast" (60), and "A Sunny Afternoon" (64). But the two studies of rough sea surpass everything else, and are alone worth a visit.

CARPENTERS' HALL LECTURES:

CANTERBURY CATHEDRAL.

THE fifth of the present course of free lectures on matters connected with building was delivered in the Hall of Carpenters' Company, London Wall, on Thursday evening last week. The Dean of Canterbury presided, and in introducing the lecturer, Professor R. Elsey Smith, he said that the lecture on "Canterbury Cathedral" was partly prepared for delivery in that Hall by the late Professor Roger Smith, whose son, just a year after Professor Smith's lamented death, would read the lecture prepared for delivery a year ago.

Professor Elsey Smith then read an interesting paper on the cathedral, illustrated by a large number of lantern views. He said that the cathedral has sufficient peculiarities of plan and structure to make it a very interesting object to the student of architecture. Both the historical and the architectural side of Canterbury had been studied and analysed by two of the finest intellects of the last century. Dean Stanley's "Memorials" and Professor Willis's "Architectural History of Canterbury Abbey" formed, between them, a mine of valuable matter. Canterbury was marked by the peculiar form of Norman architecture which part of the building displayed—that part which dates from soon after the Conquest—and also by the French peculiarity of plan—a chevet or eastern apse surrounded by small chapels. Further, its treatment, by which he meant its columns, windows, carving, etc., of a rather later date, was essentially French, and not English—this was due to a French architect having been employed. Lastly, there was an entirely original and unusual development of plan at the east end. There were four points to be noticed:—(1) Exceptional Early Norman work, (2) the French plan of the east end, (3) French treatment, and (4) a quite exceptional choir. Having sketched the history of the cathedral from its foundation to the murder of Thomas à Beckett, the lecturer referred to the destruction by fire of Conrad's glorious choir in 1174—four years after the Archbishop's assassination, and to the calling in of a Norman architect. William of Sens found his clients convinced that the damage done by the fire was not irreparable; that columns, though cracked and split, could perhaps be made to do again; and that the same thing was true of the walls. Like a judicious architect he set himself to acquire the confidence of his clients, and this was partly done by the energetic and business-like way in which he arranged to import stone and other heavy materials by water. He made very careful surveys of the ruins, and later on suggested that the columns rent by the fire and all that they supported must be destroyed if the monks wished to have a safe building, and at length they agreed. The new columns were carried up 12 ft. higher than the old ones had been, and thus, necessarily, the whole building, east of the transept, was made far loftier in its proportions than before. The plan of the choir as it is at the present day was, no doubt, settled by William of Sens. It presents the peculiarity that the lines of the columns separating the nave from the aisles were sloped inwards for two bays starting at the ninth column, and there was added eastwards a beautiful and comparatively narrow centre, which is known as Trinity Chapel, and has double columns and other refinements, with a wide aisle running round it. This was intended to receive Becket's shrine. The slope was made to fit in tolerably well between the side walls of St. Andrew's and St. Anselm's towers, but it produced a singular and not altogether pleasing effect both inside and out. Lastly, a charming circular chapel, known as the Corona, was erected last of everything. After William of Sens' accident and his return to France, the English William completed what William of Sens had designed and begun, and the differences between the work of the two were not great. English William, however, showed, if possible, a more refined taste, and the carving of the capitals of his columns was of the most beautiful description. In 1378 Prior Chillenden pulled down the nave and transepts and west front and rebuilt them in the Early Perpendicular style. This work appeared to have been completed about the year 1410, and in design it in many respects resembled the contemporary work which was being carried on in the nave of Gloucester Cathedral at the time. About eighty or eighty-five years later the magnificent central tower was carried up by Prior Goldstone. Prior Chillenden in rebuilding the west front had left part of a Norman tower standing; in 1835 this was taken down and the present north-west tower erected. Another work was the construction of a heavy, exceedingly ugly top to the Corona, which it would be a charity to remove.

The lecturer gave a technical description of the building, and in conclusion he said:—"Nothing can well be more dignified or peaceful than the present aspect of Canterbury Cathedral. It is shut in from the rush and hustle of the outside world by the magnificent and extensive grassy close which surrounds it. Here and there we see a large and dignified canon's house, and here and there a grand tuft of venerable trees. All this seems to offer a striking contrast to the disturbed and distracted story we have gone through. Sacked in the XIth century, burnt just after the Conquest, no sooner rebuilt

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than the presbytery is pulled down to make room for a larger; the scene of, perhaps, the foulest murder in English history, and unquestionably the most debasing penance that any English king ever underwent; once more destroyed by a disastrous fire; then, for about three centuries, the most popular resort of pilgrimage in Europe—with its great days, when, it is said, 100,000 visitors would assemble, making it like a Crystal Palace on Whit Monday—its princely worshippers; then the crash, when in 1538 the Lord Cromwell destroyed all the splendid fittings of the interior—an interior, remember, probably as bright with gold, and jewels, and shrines, and colour as the most elaborately-finished cathedral that you cou'd find at the present day in France or Germany."

On the motion of the Chairman a vote of thanks was accorded to the lecturer for his address. The Rev. Dean said that from the year 600 the cathedral had been growing to its present perfection, and they would not be surprised to hear that works were requisite upon it to retain it in its present beauty. The Bell Harry tower now requires a great deal of reparation and to that end it had been very carefully examined by the cathedral architect. He was delighted to say that in its substantial structure the tower was safe. There was no danger of any such collapse as there was at the central tower of Chichester some time ago; still, the tower had been seriously damaged by the weather. The Ecclesiastical Commissioners had spent a thousand pounds in order thoroughly to examine the tower, and, when they knew the extent of the damage and had formed an opinion of what they ought to do, no doubt they would have to appeal to the British public to contribute several thousand pounds towards the maintenance of this great relic of English architecture and Christianity.

On the motion of Mr. Percy Preston a vote of thanks was accorded to the Chairman for presiding, and the meeting then terminated.

THE COAL SMOKE ABATEMENT SOCIETY.

THE annual general meeting of the members and friends of this Society was held on Tuesday, by permission of the Duke of Sutherland, K.G., at Stafford House, St. James's, Sir William Richmond, K.C.B., R.A., presiding.

The Chairman, in proposing the adoption of the report, said the Society, although small, was a very active one. It did a great deal of work, but they had not sufficient money to do all they would like. If they had more funds they could do double the work they at present accomplished; but still the amount of work done in the past year was very considerable. From January 1 to December 31 the Society's inspector reported 2,000 observations of smoke pollution, which led to the detection of 1,460 cases of nuisance, and upon those observations 1,278 complaints were forwarded to the various metropolitan local authorities. Following those complaints forty summonses were issued under the Acts, involving the offending firms in penalties and costs to the amount of 104*l.* 15*s.* In testimony of the effect of the Society's steady and persistent method of procuring the enforcement of the law, the Committee had been able to draw up a list of sixty-eight firms who, before the Society exerted and made itself felt, habitually polluted the atmosphere of our city with one or more chimneys, and whose works within the past six months had not been observed to emit any smoke at all. When they thought that all that work had been done with only one inspector he thought they would agree with him that it was a great achievement. Before their Society was founded none of the London boroughs paid any attention at all to the clause in the Public Health Act relating to the pollution of the atmosphere by smoke. The L.C.C. took no action in the matter, and the borough councils obstinately refused to obey the law. When they started the Society they determined to proceed in the simplest way, and, instead of trying to frame a new law, to try and get the existing law put into operation. They were now in co-operation with almost all the borough councils in London and with the L.C.C., and that body was now meditating a most desirable scheme, which was to fine offenders 10*l.* for the first offence, the fine to be doubled on a recurrence of the nuisance. That had been done at the instance of their Society. The City of Westminster was in harmony with the desires of the Society, and he was pleased to find that they were able to prosecute clubs for emitting black smoke. The manufacturers said that it was the domestic smoke that caused the nuisance, but that was not true; for, if they were to take away the factory smoke from London and its environments, they would abate half, if not more, of the smoke of London. Therefore the Society was going to continue its efforts in forcing the various county councils and borough councils to adopt the Act and enforce it with rigour. West Ham was a very great factor in the smoke nuisance question; the sanitary authorities of that place had been very remiss in the performance of their duties, and although they had received from the Society 572 observations, the borough councils had refused to act, so they were now taking the matter into stronger hands, and had appealed to the Local Government Board to perform the duties which the borough councils ought to do. With regard to domestic grates, there was no doubt that they could get rid of the smoke from that source if they chose, but the Society would rather press the question of the manufacturer first.

Dr. H. A. Des Voeux, the Hon. Treasurer, in seconding the motion, said he hoped friends would notice that the Society spent last year 47*l.* more than it received. He was inclined to think that much might be done with the domestic grate. There were 600,000 kitchen chimneys belching forth smoke in London every day, and he thought all ought to do what they could to diminish the smoke from that source.

The report was adopted.

Sir Thomas Barlow, proposed the following resolution:—"That the pollution of the air by coal smoke is injurious to public health and vitality, destructive to works of art and vegetation, and directly demoralising to the inhabitants of a great city." He said that it was always best to avoid exaggeration, and, although it was true that human life in this country was undoubtedly lengthening, there could be no doubt that in respect to London-born people there was a considerable deterioration in many different ways and due to many different causes. One factor that they were apt to forget was the influence of sunshine in promoting health; and the great hindrance to sunshine in this country, and particularly in London, was the amount of mineral particles in the atmosphere. When they talked about fogs, people generally thought about November fogs, but as a matter of fact we always had more or less fog in this country due to smoke contamination. The result was a lowered standard of health and vigour which was most manifested amongst growing people. We were only on the threshold of understanding the importance of sunlight as a factor in health, and architects and builders could do a great deal of good by giving increased window space. They could also do good by limiting the erection of those enormous flats which really converted some of the West-end streets into wells. But the most crying necessity was to reduce the amount of carbonaceous elements in the atmosphere. He need say little about the effect of smoke on many of our beautiful buildings—it was obvious to all—and it was nothing short of pitiful that so many of London's beautiful buildings should be ruined by a cause which was preventable.

Mr. W. N. Shaw, M.A., in seconding the resolution, remarked that he believed some people thought that smoke was useful in that it had the power of destroying germs, but that was a great mistake—there was no disinfectant to be compared with the action of sunlight. While people were very careful about what they ate and drank, they were wonderfully apathetic about the air they breathed; we did not even keep ourselves informed of the state of the atmosphere, although records were carefully taken in Paris. He estimated that London spent 2,500,000*l.* a year on dirt, so there was money in trying to prevent it.

Mr. Ebenezer Howard, of the Garden City Association, proposed the following resolution:—"That this meeting, in recognising the practical results already achieved by the Coal Smoke Abatement Society with the limited resources at its disposal, and in approving of its line of action, pledges itself to use its best endeavours to place it in a position to extend its operations." He said that in their first garden city they would adopt several means to try to minimise the smoke nuisance, and they looked for great help in that direction from the fact that they would have all their machinery propelled by electrical energy which would be generated by Mond gas.

Mr. Julian J. Corbett seconded the resolution which was carried.

The President and other honorary officers having been re-elected, the proceedings terminated with votes of thanks to the Chairman for presiding and to the Duke of Sutherland for the use of the room.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

V.—BELGRAVE HOSPITAL FOR CHILDREN AND BISHOP'S HOUSE, KENNINGTON, S.E.

THE large attendance of members at the fifth visit of the session on Saturday afternoon, March 19, testified to the success of the current series, in which a useful and varied selection of subjects has been made by the Committee.

The Belgrave Hospital for Children proved to be a source of keen interest and general admiration, both from the nature of its planning and from its architecture. We published a view, together with a plan and brief description of some of the materials used, on May 9, 1903, and we now supplement that account with some information of general interest arising from our inspection. The architect, Mr. H. Percy Adams, has succeeded in producing a truly impressive building, although as yet incomplete, in which a generous massing of the red brick material is the dominant influence in the breadth of the exterior effects. Unlike what is usually found in these institutions, the windows have stone mullions and transomes with metal casements; the recessing of this stonework in the walls and many another subtlety tell what pains and thought have been bestowed on the design. Another factor contributing to the satisfactory results is the steep tiled roofs, while the necessary sanitary excrescencies are well schemed with the general grouping and enhance the dignity of the whole.

This institution was formerly housed in the Grosvenor-road, Pimlico, but it became necessary to extend its work and to acquire new premises in another district, and the building under notice, which was opened early in 1903, now supplies its needs. The site provides frontage to three streets, and, although small in extent, has been utilised to the best advantage. The ultimate form of plan will comprise, broadly speaking, a central administrative block, three wings containing wards, and an out-patients' department. At the present time, however, the south-west wing and the upper part of the south-east wing have not been built. The main entrance on the ground floor is placed on the Clapham-road front facing north-west. To the left on entering are a casualty ward and small isolation room, arranged for the convenient reception and discharge of accident cases, while on the right is the secretary's office, etc. The entrance passage, which is barrel vaulted, finished with an interesting mosaic, leads to the central staircase hall. This is a lofty apartment, lighted at the roof by large dormers, in addition to windows in the walls. Here the feature is the teak staircase, the treads of which are solid timber. A very simple yet pleasing decorative treatment in marble, executed by Messrs. Burke and Co., has been applied to the ground-floor story. The flooring is laid in 12-in. squares of Piastraccia marble, and the walls, to a height of about 7 ft., are covered with the same material, finished with a small moulded capping of Irish green. A neat marble chimney-piece in an arched recess and a commemoration panel treated in excellent scale complete the elaboration of this charming interior.

A door opposite to the main entrance leads to the kitchen and larders occupying the lower story, which is the only part yet built, of the south-east wing. Lifts are provided for the delivery of coals and meals to the upper floors.

A corridor, decorated in a similar manner to the hall, gives access to the surgery and medical staff apartments in the north-east wing and to the out-patients' department, placed between the two last-named blocks. A successful piece of planning has been contrived for the convenient working of out-patients' demands. Entrance is gained from the side road, and immediately on entering cases are diagnosed, and directions given as to subsequent procedure. In the large waiting-hall adjoining notices and signals are displayed indicating the respective medical or surgical consulting rooms, whilst the central door leads to the dispensary, and onwards to the exit facing the back street, thus avoiding congestion about the entrances. In the basement rooms are provided for dealing

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with contagious or emergency cases. Although this department is practically one-story high, a few bedrooms are provided on the south side intended for isolation purposes. When built, the ground floor of the south-west wing will chiefly accommodate the matron's apartments.

Above the entrance, on the first floor, is a babies' ward, lighted on three sides by large mullioned windows; tile lining here, as indeed in all the wards, covers the whole of the walls, and a happy idea is introduced in large decorative panels with figure subjects representing nursery rhymes. These are designed by Miss Gertrude Bradley, and executed by Messrs. Simson in 6-in. glazed tiles. Doorways in the two front corners give access to small lavatory and cleaning places, cross ventilated, and disconnected from the ward in the usual way. The first and second floors of the north-east wing consist of children's wards, nurses' room, ward kitchen, linen-room, and disconnected sanitary apartments.

In addition to hot water heating, the wards are also warmed by Shoreland's stoves, occupying the centre of the room; these have specially designed glazed-ware coverings. With reference to the internal finishings, the walls are lined with a glazed tiled dado, and much effort has been made to maintain rounded corners in plaster, wood, and glazed-ware work. The floors are laid with teak blocks. No pains have been spared in making the wards cheerful, and no small detail omitted in the efficient arrangement of cleansing appliances.

In the central part of the second floor is a large operating theatre lighted from a long skylight. The walls and ceiling are lined with tiles throughout, and the floor laid with terrazzo paving. Various operating tables and the necessary appliances were inspected. Some special artificial lighting and water taps devised by Dr. Clinton Dent excited considerable interest. An independent system of electric heating and ventilation upon "plenum" lines is installed in order to produce required temperatures at all seasons of the year; this, together with the general warming plant, is the work of Messrs. Rosser and Russell. The skylight referred to is double glazed to resist external influence upon the temperatures of the interior.

Above this theatre, on the third floor, are nurses' recreation and writing rooms, and over the ward in the north-east wing are the nurses' bedrooms. The topmost story of the central block is given up to servants' bedrooms.

The heating chamber is situated below the main entrance, and contains two 20-ft. Lancashire boilers, fuel stores, etc. In the rear of the site is a small detached building containing mortuary, post-mortem room, and microscopic examination room. Thirty-seven thousand pounds is approximately the cost of the buildings so far as they are now finished.

Space does not permit of detailed reference to the innumerable small matters of vital importance necessary to a hospital building, but it is not too much to say that this institution is thoroughly equipped for its work, and is at the same time an admirable example of modern architecture.

The Honorary Secretary of the Association, Mr. Ambler, proposed a hearty vote of thanks to Mr. Adams, whose presence added materially to the success of the visit, and whose explanations were much appreciated. The kindness of the staff in permitting members to wander over the buildings was also recognised in the enthusiasm which greeted the proposal.

By the permission of the Bishop of Rochester, the party was afterwards allowed to visit the Bishop's house in South-place, Kennington-park-road, a four-story red-brick dwelling built by Mr. R. Norman Shaw some nine years ago. The house is planned to meet the demands put upon it by diocesan work. The entrance, on the north-west front, opens upon a vestibule beyond which, and at a higher level, is a top-lighted inner hall. The latter apartment affords access to the dining-room, drawing-room, and study, which are arranged *en suite* to accommodate large attendances at meetings or receptions. To the left of the entrance is a spacious chapel with organ gallery. The ceiling is in the form of a plaster barrel vault intersected by lunettes, whence the lighting is derived. Oak panelling about 8 ft. high and a deep distempered frieze surround the interior, the proportions of which are very satisfactory. The detail generally is of a simple treatment in the manner for which Mr. Norman Shaw is so well known.

After examining the offices in the basement and the bedrooms on the first floor, under the guidance of the Rev. K. Clarke, chaplain, the members were most hospitably welcomed and entertained to tea by the Bishop. This concluded a thoroughly interesting and enjoyable afternoon's work.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE subject of "The Advantages and Disadvantages of Practice in the Colonies," was introduced for discussion by Mr. P. L. Waterhouse, M.A,. at the ninth meeting of the Session on the 16th inst.

Mr. Waterhouse, at the outset, disclaimed any intimate knowledge of the conditions of architectural practice in the Colonies, but he had, in the preparation of his paper, communicated with several men "at the front." As a result the experiences of Messrs. Herbert Baker (Cape Colony and the Transvaal), John Begg (Transvaal and India), R. M. Hamilton (West Australia), E. O. Payne (Natal), and S. Clarke (South Australia), were laid before the meeting, with Mr. Waterhouse's comments thereon.

As regards equipment—training—for a colonial career, there was scarcely an accord of opinion in the communications from those over-sea, nor with those in the room. There were, on the one hand, lamentations of cultured training being found next to useless, thrown away, the store of knowledge and artistic capacity consequently rusting; practical energy rather than cultured art being in chief demand in a new country. On the other hand, that a good home-training with its strenuous effort and keen competition was the best possible preparation for successful work in a colony, especially if such training could be undertaken with some knowledge of the conditions prevailing in such colony. Yes; but how many men in their early student days suspect that they are destined for any colony whatever? To go out as a specialist of one kind or another would not do. The highly strung, sensitive, artistic man, would, in all probability, be quite out of place. You required to be your own quantity surveyor, and your own everything else. You had not to be shocked at the sight of a corrugated iron building, but you had to learn to make that unpromising material presentable, and so carry on war against the corrugated curse—the "Shedifice"; and you were not obliged to stoop to the red paint-pot in the absence of a passable local tile. Neither Mr. Waterhouse nor those who joined in the discussion could allow that a good training would ever go against a man, even though his lot were cast in an out-of-the-way part of a colony. The further away from the source of learning the more valuable the knowledge possessed. It was thought that a good all-round provincial training was obviously the best to fit a man for a colonial career; but as was also pointed out, the conditions which obtained in large cities, like Melbourne, Sydney, and others, were not so very dissimilar from those at home. Perspectives were not, however, plentiful, nor was there scope for designing wall-papers, and so on. There were other notes pitched in a minor key; the colonials being evidently fearful of an exodus in force from the Mother Country if a too roseate picture were painted. But clearly a man who might succeed here would not necessarily succeed there, although a "failure" here would fare no better elsewhere. But, it was asked, what counted for success? And what for failure? For the success of some most "successful" architects at home was not precisely the kind to be envied—at least in the architectural sense. Mr. Waterhouse observed—and his views were strongly supported in the discussion—that many of the alleged disadvantages were, in reality, advantages. It was by no means an unmixed advantage to have unlimited resources to draw upon; nor were new countries alone in feeling the pinch of the financial shoe. Besides, what architect ever thought he had enough to spend on his client's building? Judging from much modern architecture it had been well had less been lavished thereon. To be able to adapt and use simple materials suitably and appropriately, was distinctly worthy an architect's best endeavours. Where the standard was low, there should be more chance of rising above it; where there were no old examples for guidance the greater the need for one able to point the way. The old Dutch architecture of the Cape was, however, well worthy of study, while India possessed some of the finest architectural conceptions of the whole world. Joinery and constructive timbering of the very best sort could be seen at Hong Kong and Shanghai, and some of the modern work at Singapore was worthy a big city. In Sydney also—as Mr. Herbert C. Corlette, the special Visitor, reminded the meeting—good work had been and was being done. An example even dated from the late Georgian period, while a vigorous Gothic revival there had produced the Cathedral and University buildings in correct style. Moreover, there were very good openings out there if a man were content to mark time a bit, and not to rely too much upon introductions—at least unless backed by a good student "record" at home first. Mr. Corlette had found corrugated iron used in two layers, with a 12 in. space between them, effectual in preserving an equable temperature, and, of course, especially so if painted white outside. He had recently observed some barrack buildings on Salisbury Plain built of corrugated iron (with thatched roofs) which struck him as showing how that unpromising material could be pleasingly treated. It occurred to Mr. Corlette whether something could not be done in the way of reducing the undoubted disadvantage felt by those in the colonies in respect to their being cut off from their professional brethren at home, and it had occurred to him that it might be possible to arrange a sort of travelling exhibition of students' and other drawings somewhat after the manner of the practice of sending certain of the Institute prize drawings round the provinces, as is done in connection with the Allied Societies. He hoped the Institute of Architects might see its way to enlarge its boundaries in this respect. There were advantages, however, in the possession of which the colonial was quite enviously regarded by most of those who spoke:—The rapid growth of new cities, practically unlimited sites, no boundary disputes, no ancient lights, comparative immunity from trade catalogues and representatives, no building regulations, elephants to ram your concrete, etc., to say nothing of the scope for initiative, independence, resourcefulness, the zest of facing new problems under new conditions with new ideas. Mr. Begg had indeed summed up the discussion in advance by observing "that most men in practice at home seemed to wish they had emigrated, while most men practising in a colony seemed to wish they were doing so at home!"

The discussion had been opened by Mr. K. Gammell, and continued by Messrs. H. Gregory Collins, Herbert Passmore, A. S. Tayler, Louis Ambler, and the Chairman, Mr. J. H. Pearson, who emphasised the indebtedness of the section not only to Mr. Waterhouse, but to those gentlemen under other skies who had so kindly responded to the request for enlightenment on a subject of such wide interest.

THE SURVEYORS' INSTITUTION:

BRITISH TIMBER AND ITS USES.

AN afternoon meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, Mr. A. Buck, President, in the chair.

The Secretary, Mr. Julian C. Rogers, having read the minutes of last meeting,

Mr. Percivall Currey, Hon. Secretary, read a list of donations to the library, and, on the motion of the Chairman, a vote of thanks was accorded to the donors.

The discussion was then resumed on the paper recently read by Mr. H. J. Elwes, F.R.S., entitled, "British Timber and its Uses."*

Mr. Daniel Watney said they were all obliged to Mr. Elwes for his paper, and also for the photographs and the slabs of timber he had brought there for the members to see. Although Mr. Elwes had been engaged in forestry for so many years, and had travelled to all parts of the globe to see trees growing, yet he (the speaker) did not agree with his conclusions in regard to a timber famine. In most discussions on the subject it was said that we are on the eve of a timber famine, but that he could not understand, bearing in mind that there were unexplored tracts of country in which magnificent timber grew. It seemed to him that the difficulty was want of transport, and that when that difficulty was overcome we should not have the threatened famine. He had been

* See our issue for March 5.

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through large forests in Sweden and Norway, and he noticed that much timber was being quickly grown there; nor did he think that the supply of timber was falling short in this country. We were told that we do not manage our woodlands and forest lands on the proper principle, and that they did these things much better on the Continent. He had been in a good many forests on the Continent, and it seemed to him that the great object there was to produce fire-wood as well as timber. What we should call waste here was called fire-wood on the Continent. Mr. Elwes said we had about 14 million acres of waste land in England. There was certainly a large area, but the area available for planting was not so extensive as that. About half that amount would be the maximum available for planting, and there was no doubt that a large portion of this might be planted with advantage to the country, both in the matter of the future supply of timber and the present employment of labour. But where was the money to come from? That was a problem Mr. Elwes might very well give some attention to. As to the underwoods of the country, they were practically unsaleable now: they did not pay for the rates and the woodman's time in keeping the fences in order, and that was all the more reason why all the tellers should be saved. We were told that scientific forestry was required, but he thought that might be overdone. He thought that every owner of an estate and every agent ought to learn the principles of scientific forestry, but if the owner learnt practical forestry he could always educate the woodman and see the work done to his own mind. New plantations were often utterly neglected because the owner had no practical knowledge. As to natural reproduction, in the woodlands of England we did not need to plant—natural reproduction would do all that was necessary. In clay grounds oak came up naturally, as did trees in the beech districts. In the Chiltern Hills, when the big beech trees were taken out the small ones took their place and grew very rapidly. As to planting oak, he believed the best way was to dig the soil about 12 in. deep, and then to sow the acorns broadcast and sow them in. Provided the soil was suitable, that would soon produce a good plantation. After two or three years the edges of the plantation should be planted with holly. All would agree that the first thing to do if they were going to plant scientifically was to clear the rabbits away. He did not agree with what Mr. Elwes said, that anyone who put his money in consols rather than in timber planting would be a richer man. If planting was done with judgment he did not think such an opinion would hold. There was one sore point in all questions of forestry and planting, and that was the question of rent and taxes and estate duties, which pressed very heavily on owners. There could not be any profit out of planting for thirty years, and yet rent, rates, and taxes had to be paid all the time, and something ought to be done to exempt from such taxes for such a period all land planted for timber. It was said that money could be borrowed from some land company, on the authority of the Board of Agriculture, for planting; but he did not like that system at all. In such an event they must plant to the satisfaction of someone else. Turkey oak had been mentioned by Mr. Elwes, but in his experience it was no good for outdoor work, though it was a very good wood for indoor purposes. He did not think spruce was worth growing; larch was worth all the other conifers put together, but it was subject to canker. Japanese larch was said not to be subject to the disease, but we had not had much experience of the tree at present. He got some seed from Yokohama recently at 15s. per pound, and as there were about thirty or forty thousand seeds to the pound he did not think it was expensive. It seemed to him that ash was quite as dear or dearer than oak at the present time. Douglas fir seemed to be a tree of the future; he thought it would supersede larch.

Mr. G. Marshall said that probably one reason why comparatively little timber is planted now was that the landowner generally thought that there would be no return in his lifetime for money spent in planting his unproductive land. Again, the landowner did not care to spend money on planting when the land was heavily rated and subject to death duties, and this was a question which was of national importance and worthy of the attention of the Government. He was glad to think that more men were now receiving sound, practical forestry training than was formerly the case, and that efforts had been made, and were being made, by the Carpenters' Company and others to encourage forestry. Mr. Elwes had referred to the question of local authorities charging timber merchants for extraordinary traffic. In his (the speaker's) opinion, this was very unfair. As to oak, English oak was far better than American for strength and durability, but the landowner planted what he thought would return him the most money in the shortest time. A crop of conifers could be matured in about sixty years, but a crop of oak would take about 100 years. Ash should be planted wherever the soil was suitable, for it was getting very scarce; it was always saleable, even at a comparatively early age. Brown oak was a valuable wood, but it took a long time to grow. One tree not mentioned by Mr. Elwes which was very useful for estate work, was the Spanish or sweet chestnut. It was obtained for about half the price of oak, and it was most useful in repairing oak fences.

Professor Schlich said it was a good thing for forestry that gentlemen like Mr. Elwes were taking up the question; but what we must guard against were hasty conclusions based upon Continental systems. We ought to approach the subject with open minds, and take care that our facts were correct. Above all, in considering the Continental management of forests, we should not forget that the condition of things in relation to these forests were different from the conditions in this country. The whole question turned on a financial point. There was not the slightest doubt that properly-conducted forests could be as good an investment for money as what were called gilt-edged securities.

Mr. Stenning said that during the last thirty years a great change had taken place in regard to the prospects of English timber and underwoods. As to the legislation affecting English timber, first of all there was the vexed question of railway rates, which greatly favoured the foreign producer. Then there were the questions of extraordinary traffic on roads, the Factory Acts, Workmen's Compensation Act, and the Death Duties. Another matter affecting timber production was the increasing cost of labour. Recent legislation had been entirely against the English timber merchants. If we took the general tendency of the present day, there was a feeling among architects, and perhaps surveyors, against the use of English timber and very much in favour of foreign timber, and that was invariably the case in a riverside or seaside town. Then the Government were always encouraging the foreign article as against the English. As to a school of forestry, everything was known that could be taught in any school of forestry as to the production and use of British timber. Yew was practically an imperishable wood, as he knew from experience. Continuity of policy in regard to forestry was a most important matter. Estates often changed hands, and, while one owner would not touch his trees at all, another would cut them down. Oak, with proper management, would pay 7 per cent.

Mr. Cowper Coles said that as to planting trees on the waste lands that had been referred to, people who thought this could be done without difficulty seemed to forget common rights and rights of grazing.

Mr. H. Jonas said that the eucalyptus tree was an evergreen, and its leaves were paler than any other evergreen we had. As an ornamental tree he thought the eucalyptus would be worth cultivating. If yew posts were used with the bark upon them they would last as long as iron.

Mr. Scammell having asked a question as to preserving timber,

Mr. Elwes, in replying to the discussion, said he had written his paper because the members of that Institution had so much influence on the future of British timber. Nothing would result unless they made the Government realise that schools of forestry would be of no avail unless something could be done to compete with the foreigner. There was no other industry which was handicapped by such severe conditions of competition as the British timber industry. First of all we were handicapped by the railways, secondly by taxes, thirdly by the undue preference shown by architects, builders, and in some cases by surveyors, and by the Government, for foreign timber. The Government would not give British timber a chance of showing its true qualities, and British producers had in every way difficulties to contend with that no other country had. In the face of all that it was asked why we did not extend cultivation and employ more labour. Dr. Schlich took a much more sanguine view than he (the speaker) did, yet he thought that a great deal more might be done than had been done in the matter of afforestation. As to railway rates, the gross unfairness of those rates could not be realised except by a timber merchant, or until they tried to collect from various parts of the country various pieces of timber. The most incredible instances had come before him during the last few months, showing the unfairness of these rates, but he believed that when merchants kicked and refused to pay the rates the railway companies generally cut down their charges, especially if a company, in any special case, were told to take the timber as it was not worth the cost of carriage. In most cases it was a matter of an individual against a company. As to the uneven growth of timber, that showed the enormous advantage of growing trees from seeds. By doing so one was able to acquire more knowledge about the trees to select. As to future timber supplies, he believed that a famine was much more imminent than Mr. Watney seemed to think, and he knew that millions of acres of virgin forest had been exhausted in America. As to the question of extraordinary traffic, the judgment recently delivered in the Norfolk case seemed to show ignorance on the part of the judge in regard to the conditions under which this so-called extraordinary traffic arose. In his opinion neither Douglas pine nor Japanese larch would become the trees of the future. He would express a warning against planting Japanese larch on a large scale. Although it did not seem to be susceptible of canker, yet they must not forget that it was now planted from healthy seed. Very often the stock from which our larch was planted was not healthy. Acacia was like sweet chestnut, it ought to be cut early. Yew was not only an almost indestructible wood, but it was a very beautiful wood when properly cut and polished. He hoped that the general question would not be forgotten, and that it would be brought before Parliament or the local authorities. The first requisite in order to get English landowners to increase the area of their plantations was to make them believe that they were being properly and fairly treated.

It was announced that the next meeting will be held on the 18th prox., when Mr. Thomas Blashill will read a paper entitled "London Streets and London Street Traffic."

Country Meeting at Newcastle.

The Council of the Institution have accepted an invitation from the members of the Northumberland and Durham, and the Cumberland and Westmorland Provincial Committees, to hold their next country meeting at Newcastle-on-Tyne, on May 26 and 27. Visits are being organised to the Elswick Works, Parsons' Turbine Works, and various other places of interest in Newcastle, and excursions to the Roman Wall, to Carlisle, Aspatria, Keswick, and other places in the Lake Districts.

MODERNITY IN DECORATION.

UNDER this title Mr. Lewis F. Day gave a lecture on the 23rd inst. to the Incorporated Institute of British Decorators at the Technical College, Bradford. The lecture was mainly in the nature of a protest against the assumption that the "New Art," so-called, was really entitled to represent the modern spirit, and a warning against the folly of cutting modern Art adrift from the past. We make too much, he said, of "modernity," we think too much of being "up to date." Our art is necessarily, and cannot help being, modern; there is no use either in forcing the note of novelty or trying to make it as modern as can be. There are tendencies of the times, he pointed out, such as the lack of sobriety and seriousness, which there is surely no need to affect. He would have artists neither hasten to meet the mood of the moment nor blindly submit to it, least of all endeavour to outrun it. He had a good deal to say as to the rashness of letting go all hold upon tradition, of which decoration can never be independent, owing as it does undoubted allegiance to traditional styles of architecture.

Admitting all danger of dependence upon precedent, and especially of slavishly following historic style and adopting its forms, he argued strongly in favour of studying what has been

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done, both for the lessons in technique and treatment to be learnt from it, and for its inspiration. He contested the theory that the study of old work is responsible for blunting the faculty of design. The man who is content to copy was never, he thought, fit to do more; it was not the fault of teaching, but owing to the rarity of the inventive faculty, that originality was a thing so scarce among us. The tendency of trade decorators to work in some accepted "style" he put down not to their study of traditional design but to trade expediency, to the trouble it saved to adopt a ready-made manner; and he twitted the modern artist with his timidity. Why be so afraid of not being modern? Apropos of the study of old work, he gave some useful advice as to the use (the limited use) of sketches and to the abuse of learning. The moral of what he had to say on the point of style was, in fact, "eclecticism"—choice; the fusion, perhaps, not the confusion, of types; though he admitted Historic Style to be at the best only an incentive—less a thing to follow than a point of departure.

The extravagances of what is termed the "New Art" he accounted for by modern ignorance of the old, for to know must be to appreciate the best. The restlessness of "up-to-date" design put it, he thought, quite out of the question in serious decoration, of which the first condition was repose. Naturalism, self-assertion, disdain of convention were no new things in Art, though we carried them perhaps in the XXth century to greater excesses than wiser men before us.

Mr. Day insisted, nevertheless, upon the value of originality and upon the right of the artist to be himself; asserting, indeed, that if he had anything in him he would be himself in whatever he did—even in what he (the lecturer) called "translation."

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Shoreditch Borough Council 480*l.* and 806*l.* for dust-destructor purposes; Battersea Borough Council, 1,235*l.* for pipe sewer reconstruction works; Hackney Borough Council, 8,967*l.* for paving works, and 27,375*l.* for various purposes; Mile End Old Town Guardians, 9,650*l.* for alterations and additions to schools; Wandsworth Borough Council, 9,000*l.* for contributions to street improvements; Westminster City Council, 52,226*l.* for various purposes; and Woolwich Borough Council, 1,076*l.* for purchase of freehold land for an open space and for machinery, and 2,550*l.* for purchase of site for baths, etc. Sanction was also given to the following proposed loans:—Hackney Borough Council, 26,000*l.* for electric lighting, street lighting, and dust destructor; Hampstead Borough Council, 9,477*l.* for paving works; Lambeth Borough Council, 25,083*l.* for paving works; and St. Pancras Borough Council, 19,000*l.* for electric light installation.

The Building Act Committee and the Works Committee.—The various committees were then appointed. The Building Act Committee consists of the following councillors: Messrs. W. Davies, F. Goldsmith, W. Goodman, R. W. Granville-Smith, H. J. Greenwood, T. E. Harvey, Capt. F. Hemphill, H. Jephson, H. A. Harber, John Lewis, John Smith, Hon. A. L. Stanley, H. R. Taylor, R. C. Phillimore, and Edward White.

It was proposed that the Works Committee should consist of the seven following members, all belonging to the Progressive party: Messrs. T. H. W. Idris, L. Sharp, Edward Smith, A. M. Torrance, Henry Ward, D. S. Waterlow, Lord Welby.

Mr. Robinson moved as an amendment that the names of Lieut.-Colonel Rotton and Mr. W. W. Thompson should be substituted for those of Lord Welby and Mr. Waterlow. He protested against the Moderate party being studiously excluded from the Works Committee, and suggested that such action was calculated to lead people outside the Council to the conclusion that there was something in the actions of the Committee which they were desirous should not see the light of day.

Mr. Torrance said he would not consent to any Moderate being a member of the Committee until he saw some sign of repentance on the part of the Moderates, for their attitude towards the Works Committee had hitherto been that of wreckers.

After some discussion the amendment was negatived by 82 votes to 37 on a division.

Application under the London Building Act, 1894.—The Building Act Committee recommended, and it was agreed, that the Council, in the exercise of its powers under sections 13 and 82 of the Act, do consent to the erection of steel and iron sheds on a site on the west side of a way leading from Bromley-road, Catford, to Aitken-road (Messrs. T. George and Son for Messrs. J. Robertson and Sons).

Factory and Workshop Act, 1901, Amendment Bill, 1904.—The Parliamentary Committee reported as follows, the recommendation being agreed to:—

"The Factory and Workshop Act, 1901, Amendment Bill, which has been introduced into Parliament by Mr. Tennant, and is supported by Mr. John Burns, Sir John Dickson-Poynder, and Mr. Peel, proposes to amend in several respects those sections of the Factory and Workshops Act, 1901, which deal with means of escape in case of fire, and also to amend the existing law as regards some other matters. For instance, the limitation which restricts the obligation to provide proper means of escape from fire to factories and workshops where more than forty persons are employed would be removed, and when a factory or workshop is in premises, parts of which are used for such other purposes as offices or warehouses, the local authority would be empowered to require the provision of adequate means of escape from fire in respect of such premises. At present the local authority is unable to take action except with the consent of an objecting occupier of any part of the premises not actually used as a factory or workshop. The Bill further provides for reference to the County Court of any claim made by an occupier of any part of the premises against the owner of the building on account of interference with the part occupied The other alterations in the law which the Bill seeks to effect relate to the production to the local authority (in London, the London County Council) of plans and drawings of any proposed alteration and construction of factories and workshops, the location of lifts and shafts, and the prohibition of unsafe premises. As the Bill deals with matters with which, under the Act of 1901, the Council has experienced difficulties, we invited the views of the Building Act Committee on the proposals in the Bill, and they have expressed their concurrence therewith. Having regard, therefore, to the importance of many of the points raised, and to the fact that fires have occurred recently, resulting in serious loss of life, which, probably, could have been prevented had local authorities been possessed of larger powers of regulation, we feel that the Council would desire to signify in general terms its approval of the Bill. We recommend—That the principle of the Factory and Workshop Act, 1901, Amendment Bill, 1904, be approved."

Appointment.—Mr. E. H. Tabor was appointed resident engineer to supervise the construction of Rotherhithe Tunnel.

Site for Fire Station, Knightsbridge.—The Fire Brigades Committee recommended, and it was agreed that the Council do enter into an agreement to take, subject to the approval of Parliament, a 500 years' lease of a piece of vacant ground, 7,575 sq. ft. in extent, at the junction of Basil-street and Hooper's-court, Knightsbridge, at a ground rent of 790*l.* a year, the Council to have the option of obtaining a reduction of the ground rent to 10*l.* a year at any time within ten years from the beginning of the lease on payment of 20,000*l.*

Drury Lane Theatre.—The Theatres and Music Halls Committee brought up a long report in which they stated that they had formulated suggestions for the improvement of Drury Lane Theatre, but no satisfactory proposals for dealing with them had been submitted. The Committee had since conferred with the representatives of the Theatre Royal, Drury Lane (Ltd.), with regard to the points in dispute, and had thoroughly inspected the theatre, with the result that, except as regards a few minor details, they were not prepared to waive any of their suggestions, and had so informed the company. Indeed they felt it necessary to acquaint the company of certain other matters, not referred to in the original suggestions, which they thought should have attention. In a letter from the company, dated January 25, 1904, it was stated that, failing a satisfactory settlement between the Council and themselves, they would be quite willing for the matter to be settled by an independent arbitrator; and in order, therefore, that that course might be taken, the Committee proposed that the whole of their suggestions should be embodied as requirements in a sealed notice under the 11th Section of the Metropolis Management and Building Acts Amendment Act, 1878. They therefore recommended that a notice under the Metropolis Management and Building Acts Amendment Act, 1878, be prepared by the solicitor, containing 143 requirements. Included in the recommendations are the following:—

"(1) That the existing gallery staircases be reconstructed in accordance with the regulations made by the Council in July, 1901, and that two additional exit staircases, 4 ft. 6 in. wide, be provided from the upper portion of the gallery to the streets.

"(2) That all doors in exit ways or staircases, including those to private boxes, be hung on the exit way or staircase side of the wall, be made to close with the stream of traffic going out and be made self-closing.

"(3) That the gallery and balcony tiers, including the floor of the gallery refreshment-room, be reconstructed in fire-resisting materials; that in the reconstruction, the seating and gangways be arranged in accordance with the regulations made by the Council in July, 1901; and that the staybars and wooden struts obstructing the seats in the gallery be removed, and that the steppings be improved to the satisfaction of the Council.

"(8) That all wood-linings be removed from all parts of the theatre, and where wood construction is exposed by so doing, plaster on metal lathing be substituted.

"(9) That the wooden louvres at the back of the gallery saloon be replaced by metal louvres.

(11) That all recesses and projections in exit ways be defended to the satisfaction of the Council.

"(14) That the doorways leading from the balcony corridors on to the grand staircases be increased in width to 4 ft. 6 in. between the leaves of the doors when open.

"(17) That the seating of the first circle be re-arranged to comply with the regulations made by the Council in July, 1901, and that slopes be substituted for the two steps by the private boxes.

"(18) That the seating in the grand circle be re-arranged in accordance with the regulations made by the Council in July, 1901.

"(21) That the refreshment bars at the end of the stalls, corridors on the p. and o.p. sides be separated by partitions of fire-resisting materials from the passages leading to the stalls exits adjoining, the doors being made self-closing and being hung to close with the main of traffic.

"(23) That when the pass-doors between the pit and the stalls corridor are not being used as exits the openings be filled in with partitions which do not resemble doors.

"(25) That the stalls seating be re-arranged in accordance with the regulations made by the Council in July, 1901.

"(26) That the pit seating be re-arranged in accordance with the regulations made by the Council in July, 1901.

"(27) That the spikes and iron pins be removed from the staybars of the pit entrance barriers.

"(31) That the rooms at the north side of the vestibule used as store for seats be cut off from the vestibule and pit entrance lobby, and from all other parts of the theatre by fire-resisting partitions, ceilings, and doors.

"(33) That central handrails be provided to the flights of the grand staircases not now so fitted, and that the stair rods be replaced by others which do not cause inconvenience.

"(34) That the doorways from the grand saloon to the grand staircases be increased in width to 3 ft. 6 in., the doors to be hung to close with the stream of traffic and to leave no recess, and that the bolts be removed from these doors.

"(35) That the kitchen and store at the north side of the grand saloon be cut off by fire-resisting materials and doors.

"(36) That the box stairs on the prompt side be reconstructed in fire-resisting materials without winders.

"(38) That the decorations around the proscenium opening, including the columns and fronts of the private boxes, be rendered fire-resisting, that the hollow space be filled in with fire-proof materials, and that the woodwork forming part of the old proscenium wall on the auditorium side be removed.

"(39) That the unnecessary woodwork beneath the floor of the orchestra be removed.

"(40) That the staircase from the grand circle to the stage level be reconstructed of fire-resisting material.

"(42) That gas be replaced by electric light throughout the theatre.

"(48) That the use of the tunnel as a dressing-room be discontinued.

"(49) That the openings between the tunnel and the spaces beneath the auditorium and the orchestra be fitted with fire-resisting doors.

"(50) That the use of the rooms in the basement o.p. side be discontinued as dressing-rooms or that they be properly separated from the stores. That the rooms be put into proper repair and the lighting and ventilation improved to the satisfaction of the Council.

"(58) That the floor of passage at the back of the stage be made fire-resisting, and that the doors from the sloping way to Russell-street be fitted with automatic fastenings as a means of exit from this part of the theatre.

"(61) That alternative means of escape be provided from all dressing-rooms.

"(63) That the floor of the property-making workshop be made fire-resisting.

"(64) That the iron doors to goods lift be made to close automatically; that the window to the cupboard looking into the lift be bricked up, and that the lift be completely enclosed.

"(70) That the scene store be properly ventilated to carry off smoke in case of fire and be separated from the workshop above by means of a fire-resisting floor.

"(73) That the opening between the electrical box and stage be fitted with a fire-resisting screen and releasing gear to the satisfaction of the Council.

"(74) That the gear for lowering the fire-resisting screen and turning on the sprinklers be duplicated so that they can be manipulated at or near the stage door as well as from the stage, that some means be adopted to accelerate the descent of the fire-resisting screen, and that stop and drain cocks under seal be fitted to the supply to the sprinkler to allow of periodical inspection.

"(75) That the portion of the stage floor between the fire-resisting screen and the orchestra wall be made fire-resisting so as to complete the separation between the auditorium and the stage at this point.

"(76) That the space between the fire-resisting screen and the proscenium wall be made good in fire-resisting materials at the sides and head.

"(77) That all scenery, wings, sky borders, cloths, draperies, gauze cloths, floral decorations, properties, hangings, curtains, etc., whether on the stage, in the auditorium, or in other parts of the premises, be rendered and maintained non-inflammable.

"(78) That the upper and lower flies and bridges be reconstructed in fire-resisting materials.

"(85) That the auditorium roof, including the wooden ceiling, be removed, and be reconstructed in fire-resisting materials to the satisfaction of the Council.

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"(91) That all exit doors from the auditorium and the stage be provided with distinctive lights fitted over them, such lights to illuminate the exit notices, and be maintained throughout the performance.

"(92) That all exit doors be provided with notices clearly painted on them indicating the method of opening them.

"(93) That broad conspicuous lines at shoulder level, with frequent arrows indicating the way out, be painted on the walls in all the corridors and exits leading to the street.

"(94) That an inscription of the following nature be exhibited on the fire-resisting screen—'Safety Curtain'—in sufficiently large letters that it can be read from all parts of the house.

"(95) That a second fire-resisting screen and sprinkler be provided on the auditorium side of the proscenium wall with duplicate releasing gear from the orchestra and stage entrance.

"(96) That all doors leading from the seating or exit ways to other parts of the premises be made to correspond in colour and decoration with the walls in which they occur.

"(97) That all soft woodwork beneath, on, or above the stage be removed, and steel and hardwood construction substituted.

"(101) That the hemp ropes by which the back battens are suspended be replaced by wire ropes.

"(107) That all fire-resisting doors be made self-closing and silent.

"(119) That the fittings generally in the theatre be overhauled, and put into good condition, or renewed, and that in the case of the gallery, the fittings be fixed higher, or others of a different kind be used."

The recommendations were agreed to without discussion, and the Council shortly after adjourned.

THE LONDON ASSOCIATION OF CORRECTORS OF THE PRESS:

JUBILEE DINNER.

THE Jubilee Dinner of the London Association of Correctors of the Press was held in the Grand Hall of the Hotel Cecil on Saturday last week, the Right. Hon. Viscount Goschen, P.C., presiding. The company included Sir W. H. Russell, Sir W. Lee-Warner, Sir J. Jenkins, Sir John Macdonell, Major-General Sir E. H. H. Collen, the Hon. Oliver A. Borthwick, Mr. H. Cust, M.P., Mr. Ian Malcolm, M.P., Colonel G. Earl Church, Major Martin Hume, Professor H. Goudy, Mr. Max Beerbohm, Mr. J. W. Cleland, Professor I. Gollancz, Mr. E. T. Hall, Mr. Sidney Lee, Dr. Garnett, Mr. W. Pett Ridge, Mr. W. L. Courtney, Dr. C. Waldstein, Mr. J. Randall (Chairman of the Association), Mr. S. F. Crampin (Secretary), and others.

The loyal toasts having been honoured,

Mr. J. W. Cleland proposed "The Houses of Parliament," and Mr. Ian Malcolm, M.P., in reply, said that if correctors of the Press wished to make their importance better known they had but to go on strike for twenty-four hours.

Sir W. Lee-Warner then proposed "The Imperial Forces," coupled with the name of Major-General Sir E. Collen, who, in response, said that criticism was like discussion—the essence of progress. We should all welcome judicious criticism, which helped us on to that path of improvement which we all desire to tread.

Mr. W. Teignmouth Shore proposed the toast of "Literature." He said there may have been periods when our literature was greater than it is now and writers greater than those of to-day, but he believed that there had been no period in our brilliant literary history when books were more seriously written, read, discussed, criticised, and corrected than now. We were apt to overlook the great amount of valuable literary criticism we received day by day and month by month in the columns of the newspapers and magazines. Editors knew that there was an increasing demand for sound criticism of good books.

Sir John Macdonell, in reply, said that, if we compared the newspapers published to-day with the works issued in what was called the golden age of literature, we could not help being struck with the prodigious advance in the matter of accuracy, and that was due to a large extent to the correctors of the Press. He had asked himself what was the origin of their art and craft? Perhaps it might be found in some form in the great Benedictine monasteries, in which MSS. were copied, but he suggested that the craft was first organised in the workshops—in the offices of the great printers of the Renaissance. Judging from an interesting letter written by Erasmus, it would appear that Erasmus himself was actually something of a corrector of the Press.

Mr. Pett Ridge also responded, remarking that he wished they could extend the sphere of their operations and even do more for writers by inventing another of those cabalistic signs—the meaning of which he could hardly guess sometimes—a sign, for instance, meaning "Is this really worth printing?" or, "Do people ever behave in this way?"

Viscount Goschen, in proposing the toast of the evening, "The London Association of Correctors of the Press and the Jubilee Pension," said that on that occasion it was natural that their minds should be carried back fifty years and that they should reflect what changes had come to pass since that time. There had been changes in style, in spelling, in humour, and in tone, and none could give a better history of them than the correctors of the Press. Style had changed very much. It flowed more freely—possibly with less dignity and less formality—than in those old days. The numbers of authors who had joined the ranks of writers in the present day, as compared with the past, seemed to be a very interesting feature in the history of literature. Interesting suggestions had been made as to lady writers, and that company knew whether they had increased the labours of the correctors of the Press. He thought it very probable that they had. One of the reasons that he was there that night was that by descent he might say he belonged to the guild of printers. Towards the end of the XVIIIth century and the beginning of the XIXth great efforts were made in typography, and he might say that his grandfather for the sake of typography sacrificed profit. When engaged upon his biography, he (Lord Goschen) came across a story of a most remarkable corrector of the Press—a scholar, almost a poet, and a man of great capacity—and it was through letters from him that he was introduced to the trials, denunciations, and protests which correctors of the Press had to go through. But this corrector of the Press was not prepared to "take it lying down." He argued with the authors, corrected their grammar, and he was always so taken up with the subject he read that he made a great many mistakes, which resulted in his being a very indifferent proof-reader, though he was an excellent scholar. He wrote, "I sometimes sit from seven in the morning till five in the afternoon poring over papers. My own thoughts have hindered me as they seize and hold an idea otherwise than they ought to do. It is quite possible that niggling about words and syllables may often go to the wall where my soul cannot tear itself from some thought or some picture." Was that their experience? Were they carried away as they read by the glory of a work or by the brilliancy of the speaker whose passages they corrected? Or did their minds become mechanical and pass over glories and garbage, scarcely knowing the difference between the two? Then he would like to know the relations existing between authors and proof-readers as regarded spelling. Did they pass things as idiosyncrasies, or correct them as mistakes? How well it would be if the new British Academy would take the matter up, and end the battle between the s's and the z's, and such like. The correctors of the Press on the great daily papers did their work with an accuracy to which everyone who was acquainted with the subject paid a tribute. Very rarely did the readers pass a mistake. He was afraid that no inventor of science would ever lighten their work. Their exhaustive work must lead to many breakdowns, which meant that many good men had to go to the wall. Happy were they who were able to appeal to such an Association as that to render them assistance, with trust funds towards which, he was glad to say, there had been a record subscription that night. Before sitting down Lord Goschen asked the company to drink the health of Sir W. Russell, who exactly fifty years ago opened his career as a war correspondent.

Sir W. Russell replied.

Mr. Crampin, Secretary, also suitably replied. As to omitting to detect errors because they were so absorbed in what they read, correctors were sometimes engaged in very uncongenial work that was certainly not absorbing. For instance, a reader who had poetical instincts might have to correct, week after week, statistics about sewage farms and manure.

Mr. Feldwick proposed the "Visitors," coupled with the names of Professor Goudy, Mr. Max Beerbohm, and Dr. Waldstein, all of whom responded.

The concluding toast was "The Chairman," proposed by Mr. Randall, and suitably honoured.

THE STUDENT'S COLUMN.—Our Student's Column article ("Arches") is unavoidably held over until next week.

ARCHITECTURAL SOCIETIES.

DUNDEE INSTITUTE OF ARCHITECTURE.—On the 15th inst. Mr. P. H. Thoms, the Vice-President of the Institute, read a paper entitled "Some Characteristic Features of Scottish Architecture." He referred to the individuality, the vigour, and the picturesqueness of the Scottish Baronial style, and traced its history and development from the XIIth century till the XVIIth, when it was superseded by the Renaissance Art. He pointed out that the form of its early features was dictated entirely by utility, by the necessity for defence, and that the later features, while retaining early forms, were often adopted more for ornament than for use. A number of lantern slides were shown and described, illustrating various features, such as towers, bartizans, turrets, corbels, machicolations, parapets, gables, fire-places, and ornamental plaster. Some peculiarities of Scottish ecclesiastical architecture were described, and reference was made to the lamentable state of decay into which many of the old castles and churches had been allowed to fall, and the loss sustained by means of wanton demolition and irreverent restoration. The lecturer concluded by impressing upon students the necessity of studying their national style, so that future buildings might retain Scottish feeling and proclaim their nationality.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The fifth meeting of the session was held at 32, Sackville-street, Piccadilly, on the 16th inst., Dr. W. de Gray Birch in the chair. The Rev. H. J. Dukinfield Astley, Hon. Editorial Secretary, exhibited a photograph of a neolithic fireplace discovered in 1903, at Shawalton, N.B., by Mr. Thos. Downes. Numerous arrow heads, spear heads and celts were included in the find. The fireplace was perfect when discovered, in the shape of a basin, and filled with burnt wood and bones. This discovery is the more interesting from being in the district and neighbourhood made famous by the much debated finds of Messrs. Bruce and Donnelly at Dumbuck and Dumbuic. Mr. Astley also exhibited a large photograph of the six coffins, each containing an almost perfect skeleton, discovered during the recent excavations on the site of the great abbey church at Bury St. Edmunds. One of the skeletons has been identified as that of Abbot Samson, who died in 1211, and has been celebrated by Carlyle in his commentary on the Chronicle of Jocelin of Brakelond in "Past and Present." Some photographs of the ancient Saxon church at Bradford-on-Avon were exhibited; one being of the exterior as it now appears after the removal of all the surrounding cottages. Canon Jones, who first brought it to light, identified it with the very ecclesiola mentioned by William of Malmesbury as having been built by Aldhelm, first Bishop of Sherborne, at the close of the VIIIth century; but recent study of the architectural details as exhibited by the pilaster strips, and the porticus on the north side, have shown that it is later than the time of Aldhelm, probably about A.D. 975. Another photograph was of the interior, showing the east wall of the nave with the little chancel arch, hardly larger than a doorway, and considered to be the smallest in England. A view also of the Bridge Chapel was given. It is hoped that a visit will be paid to Bradford-on-Avon during the forthcoming congress at Bath in August. A paper was read by Mr. Andrew Oliver, dealing with the ancient appearance and condition of "Whitehall and the Thames," and the history of the numerous stately buildings which once lined the ancient thoroughfare of the Strand. The paper, as usual with those contributed by Mr. Oliver, was profusely illustrated by old engravings, maps (including Ralph Aggas's and that of Hoefnagel, 1560) and plans, which enabled his hearers to follow with ease his remarks upon so interesting a subject. A paper was also read by Mr. Patrick, Hon. Sec., contributed by Mr. Chas. Lynam, upon the remarkable Saxon doorway in the west part of the north wall of the ancient church at Laughton-en-le-Morthen, Yorkshire, which was visited by the Association during the congress last year. The present actual doorway and door, with the jambs, segmental head and hoodmould are of modern date; but, above and surrounding this present entrance are the rude architectural features of the ancient Saxon doorway—the semi-circular arch, rebated

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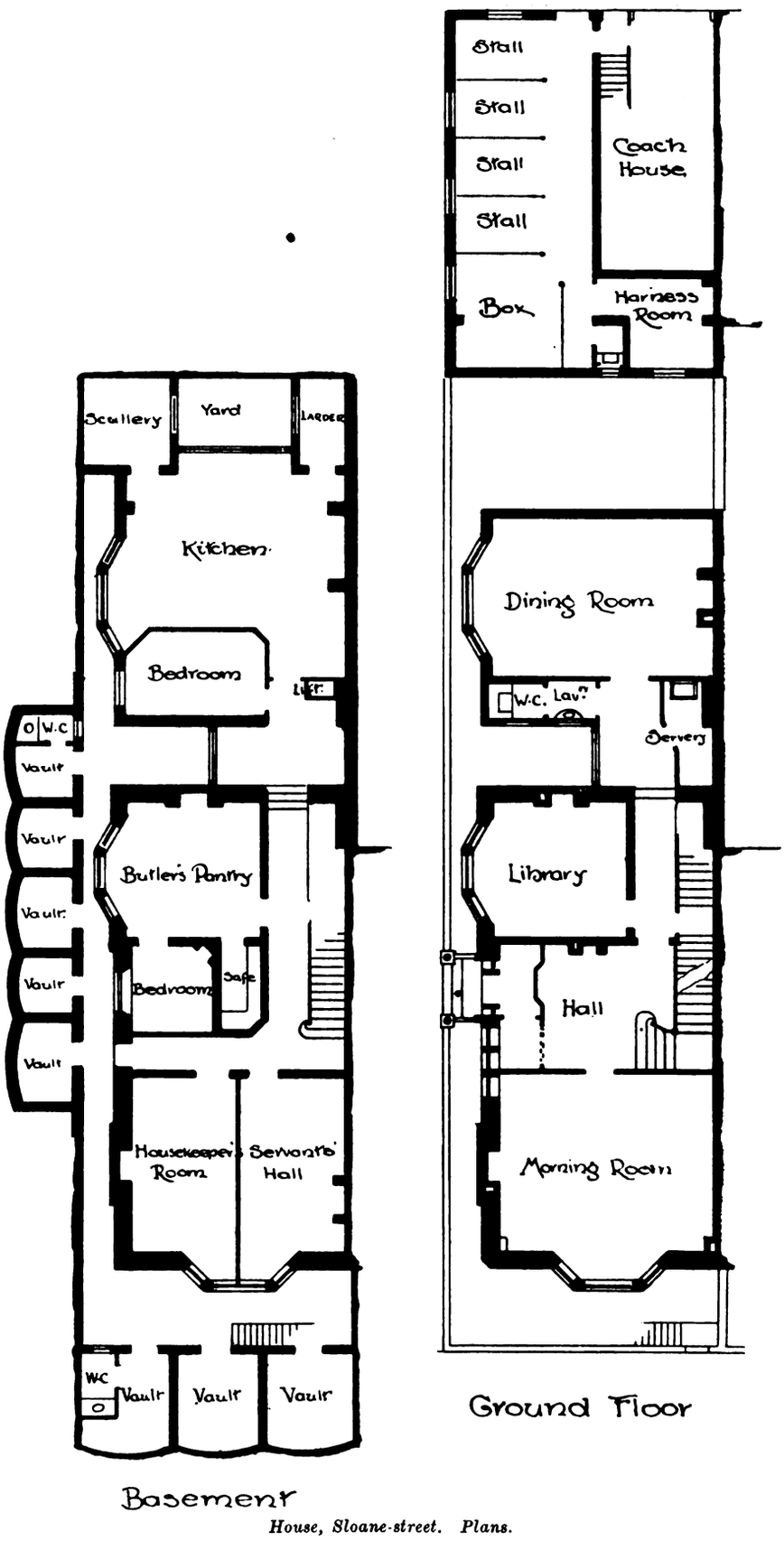
on its inner edge, with voussoirs increasing in length as they approach the centre line, the masonry smoothly wrought and joints closely fitted, but with stones irregular in size and their external line also irregular and unshaped. From the inside it is apparent that the original jambs exist and the arch-stones are of considerable size, but a modern lintel has been introduced across the opening, below the spring of the arch. On the outside, spaced at some distance from the jambs, are projecting pilasters which start from two courses of base stones in advance of the pilasters, terminating beneath projecting imposts. The shaft on the west side consists only of two stones, the lower one very long, and the upper one very short; on the east side there are three stones, the lowest one long and the uppermost two very short. The arch springs from the imposts, and its stones are rebated on the inner edge, projecting, on the face, from the wall in continuation of the pilasters below them, their outer surface being sunk back to line with the common face of the wall. This is not an uncommon feature in Saxon work, and may be seen in the pilaster groins at Wittering Church (Northants) and at Heysham Church (Lancs). There is a rudeness of workmanship in the external margin of the doorway, and in the character of the walling also, which contrasts forcibly with the more refined work of the door-arch itself, so that one is inclined to think the outer frame, with its arch and pilasters, is of the earliest Saxon period, and the inner-door arch of a later date. There is a touch of rough Roman feeling about the outer treatment, as though some clever workman, who could neither draw nor design, had struggled to put the thing together from recollections of some Roman work. The paper was well illustrated by charming sketches made on the spot, and by geometrical drawings laid down to scale. An interesting discussion followed, in which Mr. I. C. Gould, Mr. Compton, Mr. Astley, Mr. Baxter, Mr. Patrick, and others took part.

SURREY ARCHÆOLOGICAL SOCIETY. — The annual meeting of this Society was held on the 19th inst., at the Castle Arch, Guildford, Surrey. Viscount Midleton, the President, occupied the chair, and moved the adoption of the report and statement of accounts. The report is chiefly occupied with what the Society has been doing at Waverley Abbey, of which some account was given in our last (p. 314, *ante*). The report goes on: "With these results the Council has now decided to conclude the excavations, as it is advised that further work is likely to be too unprofitable to justify any increase of the heavy debt which the Society has already incurred on account of this important undertaking. The importance of the whole work is shown by the fact that the plan which it has now been possible to draw of the conventual buildings is the most complete of any which has yet been made of a Cistercian house. It is proposed to reproduce this plan in colour, and on the same large scale which has already been adopted for Fountains and other monasteries, in illustration of the full account of Waverley Abbey, which Mr. Harold Brakspear, F.S.A., has kindly consented to write for publication in the annual volume of the *Collections* for 1904." The report was carried unanimously. The retiring members of the Council, viz., Sir F. Pollock, Bart., Lieut.-Col. Marsden, and Messrs. F. A. Crisp, F. B. Eastwood, Edwin Freshfield, P. M. Johnston. W. More-Molyneux, and Ralph Nevill, were re-elected, as also were the auditors, Messrs. C. T. Davis and W. F. Potter, and the hon. secretary, Mr. Montague S. Guiseppi. Viscount Midleton then referred in feeling terms to the death of the Duke of Cambridge, patron and member of the Society, who took great interest in its proceedings, and he concluded by moving that a letter of sympathy and condolence be sent to the family of the late Duke. This was carried unanimously, and the proceedings closed with a vote of thanks to the Chairman for presiding.

WESLEYAN CHURCH, MEXBOROUGH. — On the 18th inst. the foundation and memorial stones of the new Wesleyan Church at Mexborough were laid. The new structure is situated in Bank-street, and will provide seating accommodation for 530 adults. The work is being carried out by Messrs. G. Sprake and Sons, builders, Doncaster, from the plans of Mr. J. S. Wills, architect, Derby. The total cost amounts to 4,722*l*.



House, Sloane-street. Plans.

Illustrations.

SUGGESTION FOR AN IMPERIAL MONUMENTAL HALL AT WESTMINSTER.

THIS grandiose suggestion for an English Walhalla, of which we give two illustrations, arose in the first instance from the exhibition at the Royal Academy, in 1901, of a small drawing by Mr. E. B. Lamb, representing a "design for a National Monument to British Heroes." This fell in, to some extent, with a former idea of Mr. Seddon's for a memorial hall at Westminster, and the two architects have worked out this scheme together.

From the plan it will be seen that the Hall is connected with Westminster Abbey, though the authors have not made the unwise pretence, which has been made by other projectors, that a new mausoleum connected with the Abbey offered an equivalent to "burial in Westminster Abbey." The proposed Hall would stand on its own merits as a place of monuments to eminent Englishmen.

The following are the authors' brief notes in explanation of their scheme:—

"This design is for a structure to contain monuments of high art to eminent men and women of all parts of the British Empire; that such will become a public necessity is certain, and no doubt will be called for before long.

"The site proposed by the authors, in the precincts of the Royal Abbey of Westminster, and of the Houses of Parliament, is fairly free and the only one fit for the purpose.

(*Note.*—This site was proposed for the memorial

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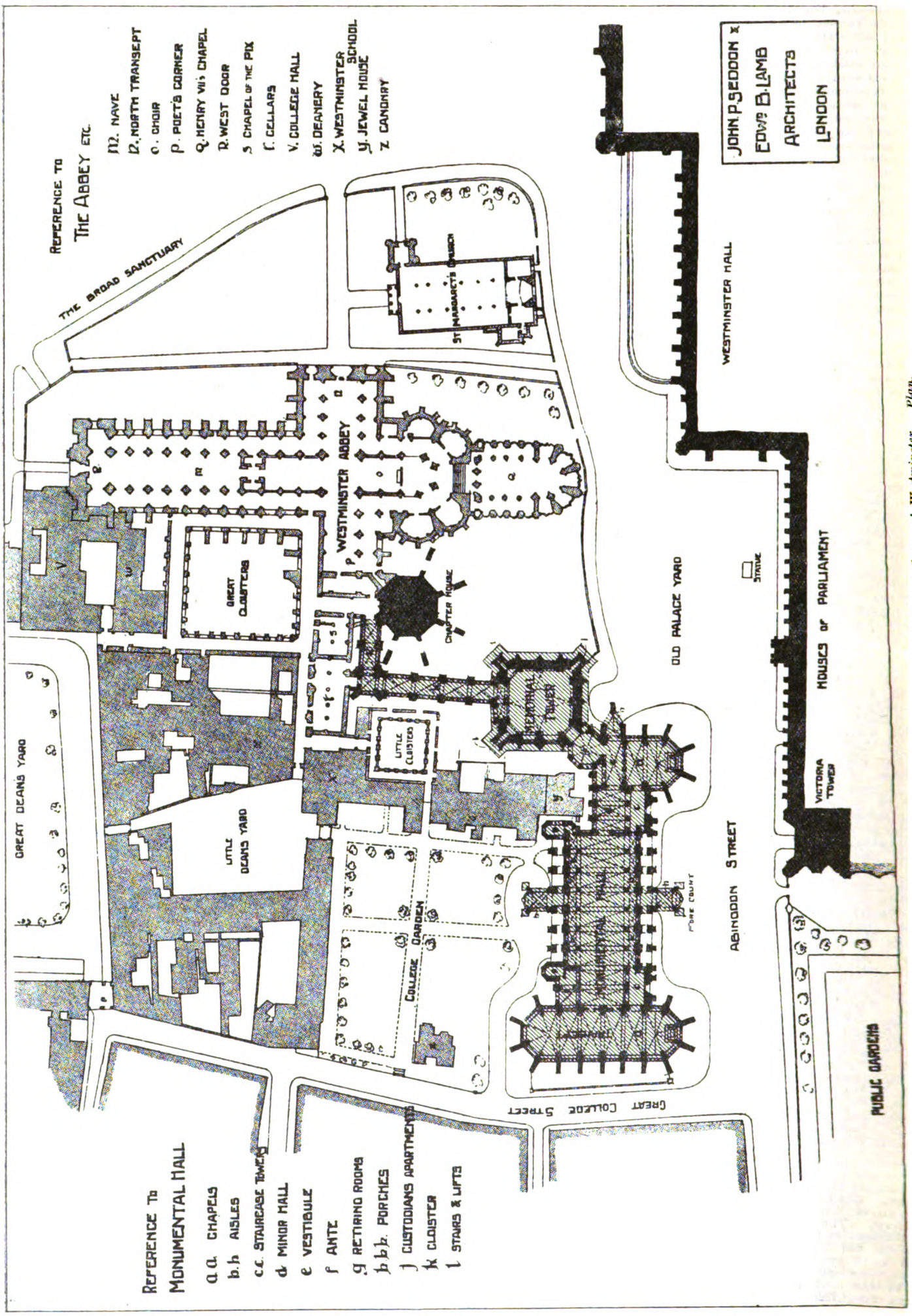
to the late Queen Victoria, but not considered appropriate for that, and rightly so for many reasons.)

"The whole group of buildings would form a worthy centre to the metropolis of the Empire 'upon which the sun never sets,' and in historic and religious interest could not be rivalled.

"Grandeur of scale and costly execution would, of course, be essential to the structure; yet the design could obviously be carried out in sections and by degrees.

"The idea, at any rate, the authors hope may lead to some adequate conception of a proper realisation of that 'Imperial thought' which has become dear to the heart of the nation and the Colonies of the British Empire."

The authors must, of course, be prepared at once for the criticism that their tower as proposed would have the result of dwarfing the Victoria Tower and the Houses of Parliament generally; and, indeed, apart from this



Suggestion for an Imperial Monumental Hall and Tower at Westminster. Plan.

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consideration, the immense scale proposed for the tower has a little too much of "megalomania" about it. A leading architectural feature on a somewhat more reasonable scale might be just as effective. But in other respects, and in regard to the plan particularly, we think the idea a very fine one, and well worthy the serious attention of the Government and the country, at least as to the main idea suggested. Even if this precise plan were not carried out, it would be something gained if the Government were induced to secure the land for such a purpose, instead of allowing it to be built over as private property. Westminster Abbey being now practically filled up as regards space for burials and monuments, we ought to contemplate the erection of a national Memorial Hall, and there is no place so suitable for it as Westminster, the historic centre of the capital.

The larger drawing has recently been exhibited, with others, in a studio near Sloane-square. The smaller one, the illustration of the scheme as it would appear from below Westminster-bridge, was specially made for us by Mr. E. B. Lamb, in order to show another aspect of the proposed grouping. As a picturesque sketch, made at the last moment, and in a wonderfully short time, it says much for its author's powers as an artistic draughtsman.

DESIGN FOR A FIREPLACE.

THIS is a design for a fireplace by Mr. Hubert Raine, which was exhibited at the Royal Academy two or three years ago, and was mentioned with commendation in our review of the Architectural room at the time.

HOUSE IN SLOANE-STREET.

THIS corner house was designed to occupy the site of two old houses, a portion of one being given up to widen the side street leading into Cadogan-square.

The external walls are faced with red bricks relieved with gauged brick arches. The stone bays and dressings are of Beer stone, the landings, porch, etc., of Portland.

The accommodation consists of thirteen bedrooms, two bathrooms; double drawing-rooms and ante-room on the first floor; dining-room, morning-room, library, and square hall on the ground floor; back stairs, service lift.

Mr. R. G. Hammond is the architect.

COMPETITIONS.

SCHOOLS, WALLSEND.—At a meeting of the Wallsend Education Committee, Canon Henderson in the chair, the sites and buildings subcommittee reported that Mr. W. S. Braithwaite, Architect to the Leeds Education Committee, who was appointed to adjudicate on the designs submitted in competition for the proposed schools at West View, had placed first the design by Mr. W. H. Knowles, F.S.A., architect, 37, Grainger-street, Newcastle, and second that of Mr. J. H. Morton, South Shields, and it was resolved that Mr. Knowles's plan be accepted. There were thirty sets of designs sent in. The schools are arranged in two blocks, one for senior and junior boys and girls, and the other for infants, and are intended to accommodate 1,300 children.

BRIDGE, AYLESFORD.—The first premiated design in the competition for a stone bridge at Aylesford over the Medway was sent in by Messrs. Dodd and Dodd, 37, Waterloo-street, Birmingham.

CHURCH AND SCHOOLS, LEEDS.—As a result of a recent limited competition for Trinity Church and Schools on the Cross Flatts Park Estate, Leeds, the designs of Mr. W. S. Braithwaite, Leeds, have been placed first. It is intended to provide a church to accommodate 650, with nave, transepts, chancel, organ-chamber, and end gallery, and a schoolroom to accommodate 400. The classrooms, ten in number, are grouped around the hall. A church parlour is also provided. The design is Late Gothic in character, is intended to be carried out in local stone, and will cost upwards of 6,000*l.*

BOOKS RECEIVED.

GREAT MASTERS: REPRODUCTIONS IN PHOTOGRAVURE. Part XI. (W. Heinemann. 5s.)

THE STEEL SQUARE. By Wm. Lanham. (E. A. Lovell, Bath. 2s.)

HEATING BY HOT WATER, VENTILATION, AND HOT WATER SUPPLY. By Walter Jones, M.I.Mech.E., etc. (Crosby Lockwood & Son. 6s.)

Correspondence.

"HOW TO JUDGE ARCHITECTURE."

SIR,—Every thoughtful reader of the *Builder* should be grateful for the article on "How to Judge Architecture" in your last issue, especially for the manly attempt to do justice to Mr. Penrose's memory. He, like an old Greek, knew as well as anyone that the refinement of the horizontal entasis would cease to exist if apparent to "the man in the street." To turn from the Parthenon to the spire, how hard would it be to decide (where doctors differ) as to the wisdom of the straight side, as at Salisbury, the concave one, as at Ulm, or the convex one of Freiburg, if each were to be condemned or praised by anyone who made that peculiarity the be-all and end-all of the design of each!

The absence of plans referred to would go far to leave the critic in the dark as to the why and wherefore of much that is inexplicable without them; indeed, I make bold to aver that very much that is purely sentimental can be infused into a plan by the lover of truth, who finds it comparatively easy, and entirely pleasing, to evolve a good elevation from a carefully thought-out plan. If the last be bad, the former cannot, of necessity, be as good as it might be, to say the least.

We most of us know that criticism of our work is frequently the most bitter and malignant from those who have the least qualification to pose as critics, and it is to be feared that similar reasoning (or unreasoning) applies also to the works of the great names of those in whose steps it is to be hoped we are humbly striving—if only at a distance—to follow. Wren's great work would have been less open to criticism had it been less interfered with by those who, not able to help, were at least all powerful to hurt. Let us invite trial by our "peers," and not by "a common jury." As you say very truthfully, the lack of good and interesting detail is a certain step towards failure. A design, too, may, as suggested, be old and also bad, as it may be new and also good; each must, in equity, be taken on its own merits, or otherwise.

E. SWINFEN HARRIS.

SOUTHWARK BRIDGE.

SIR,—I have not seen any notice in your paper respecting the reconstruction of Southwark Bridge, although the matter is of special interest as involving a great alteration in Rennie's design and both bridge and land levels on the north side; but the refusal of a House of Commons Committee to permit a rise in the Thames-street roadway, as required by the City Corporation scheme, brings the matter forward again for discussion and reconsideration.

I did before, and now again, suggest a viaduct in the middle of Queen-street for two vehicles only, continued by a bridge over Thames-street and on the north end of Southwark Bridge, leaving room for one vehicle each side of the structure. This would give a nearly level road for heavy traffic and retain space for light traffic, and also leave the old communication with Thames-street unimpaired.

CITY BRIDGE.

PATENTS IN AUSTRALIA.

SIR,—Your readers will probably be interested in hearing that the Governor-General in Council of Australia has decreed, in accordance with the new Federal Law, that patent applications for Australia can now be formally made at the Custom House of the capital city of each State. Applications so filed will be marked with the date, hour, and minute of receipt, and the applications will be subsequently recorded at the Patent Office as having been filed at that date. Applications thus filed will not be merely taken in order of their dates, but they will be held to be dated, as far as regards novelty, from the date of actually filing at the Custom House unless dated under the convention. Under the convention nearly all the principal countries and colonies have agreed to grant the right to a patentee who has filed an application for a patent in one of the countries or colonies to date any or all the other applications he may make for the same invention in other realms during the year as of the date of his original first application. The application in Australia can either be a provisional one or complete. The fees and stamp duties are just double those of an application for Great Britain and Ireland.

WM. P. THOMPSON AND CO.,
Chartered Patent Agents.

THE ARCHITECTURAL ASSOCIATION.

SIR,—As it appears that an alteration is contemplated as to the night of meeting of the Association, and as some suitable suggestions have been made in the *Builder*, let the following two then be seriously taken into consideration—viz., that the selected night of the meetings be on Tuesdays (this surely should meet with the approval of all parties concerned) and the hour be fixed for 8 o'clock, the correct and usual hour of societies of the status of which the Architectural Association ranks high as one.

A MEMBER OF THE ARCHITECTURAL ASSOCIATION.

[**** We print the letter of "a Member," but must renew our own caution against changing the day, which we think a mistake.—ED.]

FIRE RISKS IN FACTORIES.

SIR,—In view of the interest now generally exhibited with regard to fire risks, we think that our experience recently may be worth recording.

Unfortunately a rather serious fire broke out in one section of our works the other day, but, owing primarily to two causes, we have been fortunate in escaping with comparatively slight damage.

The fire commenced at one end of the top floor of a four-story building, measuring some 200 ft. by 50 ft., filled with valuable machinery, and with work in progress. The marvel is that once well alight it was possible to confine it to such a comparatively small area as was the case, about one-third of the roof being destroyed. This roof was on the saw-tooth principle, slated on the one slope, and with iron sashes and glass on the other slope; and this, in our opinion, prevented the fire from running from one end of the shop to the other. It was evident that the flames ran up the rafters under the slates very quickly, but, on arriving at the top of the ridge, they were checked by the open space, and had to curl down and commence again at a spot several feet below and at some distance away. This had to be repeated as each ridge was reached, and to this, we believe, we owe the fact that the roof escaped as it did.

The second reason for the fire being confined was the use of armoured fireproof doors over the opening into the stores adjoining. These doors stood their test remarkably well, and are hanging at the present moment in perfect working order.

P. G. EBBUTT
(For "Verity's Ltd.").

ROYAL COMMISSION ON LONDON LOCOMOTION.

AT the sitting of the Royal Commission on London Locomotion on Thursday last week evidence was given by Mr. R. W. Perks, M.P., formerly solicitor to the Metropolitan Railway Co., and at present Chairman of the Metropolitan District Railway Co. Witness described a large number of negotiations he had carried out for the amalgamation of various undertakings. He was opposed to the L.C.C. becoming the railway and transit authority for London and the suburbs, but was in favour of a tribunal to deal with all questions affecting the London and suburban railway, street, and other traffic. With a view to increase the efficiency of London railways, and to enable them to provide suburban services, witness submitted a number of suggestions to the following effect:—(1) That the Metropolitan and District Companies should amalgamate, and should charge a uniform fare; (2) railway companies should have power to run upon main thoroughfares cars propelled by electricity, or other power as feeders for their main lines along routes beneath or over which it is inexpedient to construct railways, and that power should be given to the railway companies to subscribe to tramcar undertakings; (3) the present prohibition upon the railway companies acquiring and holding lands should be removed, so that the railway companies might be encouraged to construct suburban lines by looking to some extent for their remuneration to the increment which would take place from the value of the lands by the construction of the railways; (4) railway companies should be exempt from local taxation along routes where new competition had been set up by the local authorities running at the public cost competitive tramcar or railway undertakings.

At the sitting on Friday, Mr. Perks gave further evidence. He pointed out that the Thames Embankment, Holborn Viaduct, and several bridges were built by the Metropolitan Board of Works to a large extent from the coal dues, which produced 350,000*l.* a year. In his opinion that was a very reasonable form of raising capital for the construction of Metropolitan works. He would not hesitate himself to reimpose this tax for the purpose of constructing main roads and other works. He suggested that a circular road should be constructed round London which would couple up all the

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little towns round. The road would be seventy-two miles long and 250 ft. wide, with two bridges over the Thames. It would couple up numerous little suburban towns, but in twenty years' time the whole of the districts would be covered with houses. The cost of such a road would not be more than the cost of Kingsway. He estimated the cost at 4,500,000*l.* Electric tramcars could run on this road.

OBITUARY.

MR. D. W. STEVENSON.—We regret to hear of the death, on March 18, at Edinburgh, after a long illness, of Mr. D. W. Stevenson, the sculptor, aged sixty-two years. Mr. Stevenson was elected an Associate member of the Royal Scottish Academy in 1877; nine years subsequently he became a full member of the Academy. When fifteen years of age he entered, as a pupil, the studio of William Brodie, sculptor. He designed and executed several public statues and memorials for both Great Britain and foreign countries, and carried out many commissions for private individuals. Of his more important sculptured works we should mention the bronze statue of "Highland Mary" set up at Dunoon eight years ago; the statue, also in bronze, of Burns at Leith (1898); the marble bust of Burns for Tullie House at Carlisle; the statues of King James I. of Scotland and of John Napier of Merchistoun, the inventor of logarithms, for the façade of the National Portrait Gallery at Edinburgh (1898); the marble busts of Thomas Carlyle for the Carlyle Memorial House in Cheyne-row, Chelsea; of William Burns, the historian, and Allan Ramsay for the Wallace Memorial at Stirling; of Dr. Robert Brown, the botanist, for the Picture Gallery of the Marischal College at Aberdeen; and the medallion portrait, in bronze, set up two years since in the Indian Museum at Calcutta in memory of the late Dr. John Anderson, who was the first superintendent of the Museum during the interval 1865-86. Mr. Stevenson was also the sculptor of the monument to the late R. Burns Clegg in the East Cemetery at Kinross, and of the drinking fountain, carved in Scotch red sandstone, with a marble bust of the late H. W. F. Bolckow, which in the autumn of 1896 was erected in the Albert Park at Middlesbrough.

MR. B. H. NUNN.—We have to record the death, on the 19th inst., of Mr. B. H. Nunn, architect, of Brighton. Mr. Nunn, who was the son of a builder at Homerton, made the original drawings for the Brighton Workhouse, in which work he was associated with the late Mr. George Maynard, then Surveyor to the Guardians. After Mr. Maynard's decease he designed and carried out the new casual wards and two new infirmary pavilions. The last public work upon which he was engaged was the new board-room and offices in Prince's-street for the Guardians. Mr. Nunn acted as engineer for the main drainage scheme of Hurstpierpoint, which was carried out under his direction. He also did much work as a quantity surveyor, in which capacity he was engaged on all the important contract works carried out for the Brighton and Hove governing bodies, and many works out of Brighton, including extensive works at the Asylum, Hayward's Heath, and at Lewes Gaol, police stations at Portslade, Preston, Hurstpierpoint, Worthing, and Patcham, new workhouse, Chailey, etc. In 1891 Mr. Simeon Hunt became his partner, and has carried on the practice since 1895, when Mr. Nunn retired.

GENERAL BUILDING NEWS.

CULROSS ABBEY CHURCH.—A number of tradesmen have been asked to tender for the work of restoring Culross Abbey Church, which in the early part of last century was deprived of some of its best architectural features. To thoroughly renovate the church a sum of about 5,000*l.* will be required. Seventeen hundred pounds have been subscribed, apart from the heritors' contribution. Alternative schemes have been prepared by Sir Rowand Anderson.—*Scotsman.*

CHURCH, GRIMETHORPE, YORKSHIRE. — The Church of St. Luke, which has been erected at Grimethorpe, at a cost of 6,500*l.*, has just been consecrated, as we stated last week. The church is built of red brick with stone facings. The building consists of a nave of five bays, with north aisle, chancel, organ chamber, choir, clergy vestries, and porch. It is intended at a future time to have a south aisle and chapel added to the church, the south side now being built up with a temporary wall. At present the church is illuminated by lamps, but these will be replaced by electricity as soon as possible. There is seating accommodation for about 500 persons. The architect was Mr. C. Hodgson Fowler, Durham, and Messrs. Bowman and Sons, Stamford, were the contractors.

ST. BARNABAS'S CHURCH, JESMOND. — This is the first church built under the Jesmond Church extension scheme. The style of St. Barnabas's Church may be described as an adaptation of XVth century architecture. The chief features that strike one on looking at the building are the apsidal ends east and west, which were originally suggested by the peculiar shape of the site. The plan consists of nave and chancel, 28 ft. wide, the combined length of which is 137 ft., narrow aisles, containing passages, which can be extended in width when desired, so as greatly to increase the accommodation, a tower, and clergy and choir vestries. The tower, when finished, will rise to a height of 85 ft., with traceried battlemented parapet and pinnacles. At present the height is about 40 ft., with a turret containing a bell in one angle. The materials are stone externally, chiefly from the Byker quarry; internally the walls are faced with plaster. The roofs are of pitch pine, the outer covering being of Westmorland green slates. The screens and wall panelling are of pitch pine. The nave has six bays on each side of rather low arches, with an arcade of pointed arches above, springing from slender shafts. The same arrangement is found on the south side of the chancel, whilst on the north side it is varied by a lofty organ chamber arch. The roof is of the open timber type. The pulpit is of oak from the designs of the architects, and executed by Messrs. Brown and Hughes, of Newcastle. The choir fittings were originally in the Parish Church. The electric installation has also been given by the Parish Church congregation, the brass gasoliers originally at the Parish Church having been converted into electroliers and installed by Messrs. Reid, Ferrens, and Co. The heating is by steam, and has been carried out by Messrs. Dinning and Cooke; the builders and joiners are Messrs. Wm. and G. H. Scott, of Sunderland, the work having been carried out under the superintendence of Mr. R. Whichello, the clerk of works. The church was designed by the late Mr. W. S. Hicks, and has been completed by the present firm of Messrs. Hicks and Charlewood, of Newcastle.—*Newcastle Chronicle.*

R.C. CHURCH, GLENAMADDY, IRELAND.—The foundation-stone of the new Church of St. Patrick, Glenamaddy, was laid recently. The style of the new building is Gothic, and the plan consists of nave and aisles. The clerestory is to be supplied with eighteen pairs of lancet windows, suited to the height, and the roof is to be supported by sixteen octagonal pillars. The walls are supported by buttresses, and the outside will be of ashlar. The building is to be 130 ft. long and 60 ft. wide, and capable of accommodation for from 1,000 to 1,200 worshippers. Mr. Thomas Hamilton, of Galway, is the architect.

PRIMITIVE METHODIST CHURCH, WHITLEY BAY.—The new Primitive Methodist Church at Whitley Bay occupies a site at the junction of Oxford-street and North-parade, Whitley Bay. The main entrance doors face into North-parade and open into a porch, beyond which there is an inner vestibule, with doors leading directly into the aisles of the church. The internal dimensions of the church are as follows:—Length, 48 ft.; width, 36 ft., with a width of 40 ft. between transepts. There is seating accommodation for over 300 adults. The choir is placed in a recess at the back of the church. The rostrum and communion stand near, and an organ chamber is also provided. At the rear of the church there are a ministers' vestry, stewards' vestry, tea-room, lavatories, and outbuildings, also a hall and a side entrance porch. The walls are of brick, the main elevations being faced with red pressed bricks, with stone dressings. At the north-west corner there is a tower and spire. The buildings have been erected by Mr. W. A. Styan, of Whitley Bay, from the designs of Mr. T. E. Davidson, of Newcastle.

LITTLE ILFORD CONGREGATIONAL CHURCH AND SCHOOLS. — The opening ceremony of these buildings took place on the 17th inst. The block occupies a corner site, and a tower is a prominent feature of the design. The facings are of pressed red brick. The church provides accommodation for over 800 persons. A school-room, church parlour, and various class-rooms are provided. The contract has been carried out by Messrs. Gough and Co., Hendon, the architects being Messrs. George Baines and R. Palmer Baines, London, W.C.

PUBLIC SCHOOL, LANGSIDE. — The School Board of the parish of Cathcart have now accepted the plans for the new public school which is to be built at Woodlands, Langside. The successful architect is Mr. Andrew Balfour, I.A., Glasgow. The school is to accommodate 1,600 children, including 400 in the laundry and cookery rooms, and the total cost is estimated at 18,000*l.*

WESLEYAN BUILDINGS, LEATHERHEAD.—Mr. J. Weir, of Victoria-street, S.W., has prepared the plans for the erection of a large two-story building on the site of the old iron schoolroom adjoining the church at an estimated cost of 1,500*l.* The upper floor will be devoted to the "Wesley Hall," capable of seating 250 people, while below there will be class-rooms, rooms for Wesley Guild meetings, minister's vestry, and lavatories. In connexion with the scheme, new heating apparatus has been placed in the church at a cost of 100*l.*

CHURCH BUILDINGS IN KINGSWAY. — The Wesleyan Methodists have secured a site, with a frontage of 98 ft. and a mean depth of 70 ft., lying on the west side of Kingsway and to the south of Great Queen-street. The ground will be used for some extension buildings in connexion with the existing chapel in the latter thoroughfare, and the new buildings will stand at the corner of the projected new street to open westwards out of Kingsway and leading to Great Wild-street, Drury-lane.

LECTURE HALL AND SCHOOLS, YARMOUTH. — New Lecture Hall and Wesleyan Schools are being erected to meet the requirements of the Wesleyan Church, Dene Side, Yarmouth. The building is to be erected on a site to the south of the chapel, and is to consist of a central hall, with class-rooms on both sides. It will be lighted by electric current from the Corporation mains. The designs were prepared by Mr. R. Scott Cockrill, son of the Borough Surveyor. The builder is Mr. J. Easto, of Dene Side.

NEW INFECTIOUS HOSPITAL AT CONISBRO'.—The opening of the new Infectious Diseases Hospital which has been built at Conisbro' by the Doncaster and Mexbro' Joint Hospital Board took place on the 25th ult. The Hospital is situated on a site of 7½ acres, about 5 acres of which have been inclosed. The buildings consist of an Administrative Block, comprising rooms for the use of the Medical Officer, the matron, and the nursing staff, with kitchen and store accommodation. This block is more than sufficient to meet the present requirements, and it has been built with a view to future extension of the wards. The Scarlet Fever Block consists of Male and Female Wards, with two special wards containing one bed each for paying patients, with a large convalescent room over the central portion, provided with nurses' room, bath-room, and sanitary accommodation. There is also a Typhoid Block, with similar accommodation, and an Isolation Block for doubtful and other infectious cases. The Laundry and Boiler-house Block contains a wash-house fitted with the usual appliances for washing by machinery, an ironing-room with fan ventilating, drying closet, and a disinfecting chamber, fitted with Thresh's disinfector. There are also a mortuary stable, and ambulance sheds. A boiler-house, containing two boilers, which supply steam for the laundry, disinfector, hot-water apparatus for heating the wards, hot water supplies to all the baths and lavatories throughout the buildings, and for working the electrical plant. The Ward Blocks are all furnished with a glass verandah in the front, having a south aspect for the use of convalescents. The Hospital is appropriately furnished throughout, and telephone communication is provided between the various blocks. The whole of the buildings are illuminated by electric light from the De Laval Turbine Dynamo in the boiler-house, and the water is supplied from the company's main. The system of drainage is a simple one on approved lines. The buildings at present provide for the treatment of thirty-six patients, and the cost works out at 33*l.* per head. Messrs. Harold Arnold and Son, of Doncaster, were the contractors; Mr. J. M. Morton, of South Shields, the architect; Messrs. Benham and Sons, of London, sub-contractors for the engineering. The duties of clerk of works were carried out by Mr. Fred. Simpson, of Doncaster. The strings and dressings are of Doulton's buff terra-cotta, the ward stoves are Doulton's, as are also the whole of the sanitary fittings.

CHURCH ARMY HOMES, SWANSEA.—The St. David's Church Army Labour and Lodging Homes were opened recently by the Bishop of St. David's. The new building is situate in Rutland-street, and the hon. architect was Mr. H. C. Portsmouth. The "labour" and "lodging" homes are entirely separate. The premises provide a yard and workshop, quarters for the officer in charge and his family, reading-rooms and kitchens for each department, and fifty-two cubicles for sleeping accommodation. There is also a room set apart for a chapel. The top floor, of sixteen cubicles, is expected to be sufficient for the "labour" home, and the other thirty-six cubicles can be used for the "lodging" home.

LIVERPOOL COUNTRY HOSPITAL FOR CHILDREN. —The annual meeting of the friends and donors of the Liverpool Hospital for Children at West Kirby was held at the Town Hall on the 15th inst., when it was announced that

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plans for the hospital to be erected at Heswall, to accommodate 200 children when complete, had been prepared by Mr. A. P. Fry and approved by the committee.

POST-OFFICE EXTENSION, NORWICH.—The new portion of the Norwich General Post-office was opened recently. The building has been erected by H.M. Office of Works, the architect being Mr. W. T. Oldrieve, F.S.I., whilst the building operations have been carried on under the supervision of Mr. W. T. Bowman. The building, which is of Portland and Bath stone, comprises practically four stories. At the end of Crown-road an entrance for mail vans into the loading platform is provided, and the sorting office is on the ground floor. The postmen's sorting-room is on the first floor, and the instrument-room on the top floor, whilst on the King-street side of the basement is a caretaker's department with accommodation for packages, and storage for batteries in connexion with telegraphy. Extra accommodation has been provided for postmen in the shape of retiring-rooms, and separate rooms have also been set apart for male and female telegraphists.

ASYLUM, STORTHES HALL ESTATE, NEAR HUDDERSFIELD.—In a few weeks' time part of the new county asylum on the Storthes Hall estate, near Huddersfield, will be ready for occupation. It is being built by the West Riding County Council, and, when completed, will cost nearly half a million of money. The scheme is being carried out in sections. The buildings that will shortly be opened comprise an acute hospital for 200 patients and two cottage homes for workers, accommodating thirty-five cases each; but plans are now under consideration for the erection of the main institution to make provision for 600 further cases. The two firms of contractors who have carried out these works are Messrs. J. Radcliffe and Sons, of Huddersfield, and Messrs. W. Nicholson and Sons, of Leeds. The grounds have been laid out at a cost of 3,400*l.*, under the supervision of Mr. J. Vickers Edwards, the County Architect, in accordance with whose plans the whole asylum is being built. When completed it is intended that the institution shall house 2,000 inmates.

TEMPERANCE HALL, WYKE, YORKSHIRE.—Mr. T. P. Whittaker, M.P., recently opened the new hall which has been erected at Wyke in place of the old Temperance Hall. The new hall is of two stories. The lower room, which is 40 ft. long and 31 ft. wide, will be used for Sunday-school purposes. Above is a hall affording seating accommodation on the floor for 270 persons, and with a gallery for an additional hundred. The building has been erected to the designs of Mr. John W. Rowson, architect, of Girlington, Bradford. It will cost about 1,200*l.*

EASTBROOK HALL, BRADFORD.—This new hall, which is to be used for mission purposes, was opened on the 21st inst. The architects are Messrs. W. J. Morley and Son, Bradford. The building is 94 ft. by 90 ft., and is designed on the amphitheatre principle, octagon in shape, every seat being in full view of the platform. Accommodation is provided for 2,000 people. The main entrance (20 ft. wide) is from Leeds-road, with a large vestibule or crush hall 30 ft. by 18 ft., and four other entrances are provided at different points, each with a staircase leading to the gallery, thus affording ample means of entrance and exit to and from all parts of the hall. The gallery extends all round the hall and communicates with the platform on both sides. The organ, which was taken down when the old chapel was removed, will be re-erected behind and above the platform. The seats will be all separate tip-up seats, raised up in tiers for a large portion of the ground floor space as well as in the gallery. In addition to the large hall, there are included in the scheme a large lower hall about 40 ft. square, ministers' vestry, sisters' room, male adults' room, and young women's room, besides several class-rooms in different places, and a room for the choir and orchestra. The Leeds-road front is given over to rent-producing property in the form of shops and ware-rooms. A combined system of heating and ventilation is being installed by Messrs. J. Stott and Co., of Oldham. A large fan is fixed in the basement near the main entrance for the purpose of forcing fresh air into all parts of the building, but before passing into the building the fresh air is freed from all impurities by means of the Stott patent air filter or washer, which is in the form of a huge cylinder made of specially-prepared fibrous material, and revolves in a trough containing water. The heating of the large hall and the other part of the building will be independent of each other, and the temperatures can be controlled by the attendant in charge. A large air-mixing chamber will be provided above the ceiling of the large hall, into which the warmed or cooled air will be delivered, passing through numerous openings formed in the ceiling itself, the foul air being driven out through flues formed in the walls and carried to a main outlet shaft. The following are the names of the various contractors:—Masons' work and concrete, Messrs. J. Brown and Sons (Bingley); joiners' work, Messrs. Greenhow and Murgatroyd (Keighley); plumbers' work, Mr. Geo. Thompson (Leeds); plasterers' work, Mr. Thos. Bolton (Bradford); slaters' work, Messrs. Hill and Nelson (Bradford); painters' work, Mr. F. Holdsworth (Shipley) and Messrs. C. Pratt and Sons (Bradford); faience work, Mr. A. Whitehead (Leeds); steel work, Messrs. Dorman, Long, and Co. (Manchester); cast-iron work, Messrs. E. and W. H. Haley (Bradford); fibrous plaster work, Mr. W. H. Horne (Idle); white glazed bricks, Mr. H. R. Allen (Halifax); heating and ventilating, Messrs. J. Stott and Co. (Oldham). Mr. J. Billington acted as clerk of works.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOWS, PUDSEY.—Two stained-glass windows have just been placed in Trinity Methodist Church, Pudsey. The windows have been designed and executed at the studios of Kayll and Co., Leeds..

MEMORIAL WINDOW, PORTON, WILTS.—A memorial window has been placed in St. Nicholas Church, Porton. The window consists of two lights, one representing the Good Shepherd, the other the Sower, and each is surmounted by a canopy with an angel bearing a scroll. Messrs. Clayton and Bell, Regent-street, London, executed the work.

HAMPSHIRE WAR MEMORIAL.—A stained-glass memorial window and tablets, which have been erected in memory of the men of the Hampshire Regiment who were killed in South Africa, were unveiled recently in Winchester Cathedral. The memorial has been placed in the south aisle of the nave and occupies a bay-window on the east of the door. The work was carried out by Messrs. Powell and Sons, of Whitefriars, London.

HAWTHORN CHURCH, SEAHAM HARBOUR.—Two single-light memorial windows have just been executed by Messrs. Percy Bacon and Brothers, of London, and placed in Hawthorn Church, one representing St. Gabriel and the other St. Michael. An inscription brass is placed under each window.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, BUDLEIGH SALTERTON.—The Urban District Council, at a special meeting held on the 15th inst., adopted a scheme of water supply from the Colaton Raleigh source at an estimated cost of 10,000*l.*, and instructed their engineers, Messrs. Beesley, Son, and Nichols, M.M.Inst.C.E., of Westminster, to prepare the necessary plans and take the customary steps in connexion with the promotion of the requisite Act of Parliament.

FOREIGN.

GERMANY.—Professor Theodor Fischer, of Stuttgart, has applied for a patent for a plan of a theatre, which, by means of a movable ceiling, can be made into a large opera house or a small theatre at will. This ingenious invention should be of value in those towns where the expense of two separate buildings cannot be met.——Herr F. W. Büsing died at Berlin on February 25 in his seventieth year; Herr Büsing has been for some time editor of the German Architectural News.——The rooms for the architectural section of the Berlin Art Exhibition of 1904 have been designed by the architect Herr Schweitzer.——The new Evangelical Church at Weinfelden, designed by the architect Herr Pfleghard, is completed.

AUSTRIA.—A home for students is to be built in Vienna in connexion with the Technical Schools. The plans have been designed by Herr Theodor Bach, and the work is to be carried out by the Vienna Building Society. The building will accommodate about sixty students, and will also contain lecture halls, etc.——It has been decided to build an annexe to the Museum of Arts and Crafts in Vienna. The plans for the new building, which will be used chiefly for exhibitions, have been sketched out by the architect, Herr Ludwig Baumann.——The historical painter Professor Rudolf Müller died on March 7 at Reichenberg in his eighty-eighth year.——A model of the new Alpine railway in course of construction is to be sent to the Exhibition at St. Louis, with some photographs illustrating the same subject.——A site for the erection of a new workmen's shelter has been bought in Vienna. The building is to accommodate 500 to 600 persons.

SWITZERLAND.—The artist Herr Emil Schill is executing the mural paintings in the Town Hall at Basle; these will represent the Commerce and Industry and the Art and Science of the town. There will also be a large painting representing the Swiss Confederation (Bundesschwur) of 1291.

ISTRIAN CEMENT.—According to a recent despatch from H.M. Consul at Trieste, a large establishment for the manufacture of Portland cement is to be erected near Albona, in Istria, Austria-Hungary. The output is destined entirely for exportation. It is said that immense quantities of stone adapted for the manufacture of cement exist in the neighbourhood as well as a coal mine. All are situated close to the port of Rabaz.

MISCELLANEOUS.

GOOD FRIDAY WEEK.—In consequence of the Easter Holidays, next week we go to press a day earlier than usual. All communications for the Editor must reach him by *first post on Wednesday morning*, except lists of tenders, which will be received up to 10 a.m. of the same day.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. E. Roscoe Mullins, the sculptor, has removed from 24, Greville-road, N.W., to "Shirley," Dollis-avenue, Finchley, N.

THE MUNICIPAL YEAR BOOK.—The Municipal Year Book for 1904 (edited by Mr. Robert Donald, and published by Edward Lloyd, Ltd., Salisbury Square, E.C.), has been considerably improved. The plan of the book is that of a general summary of the work of each authority under the name of the city, town or district, with the statistical and other information arranged in special sections. The eighteen sections of the book are in the following order:—(1) London Municipal Government (County Council, City Corporation, Borough Councils, Water Board, Asylums Board, etc., etc.). (2) Municipal Government in England and Wales (contains the general summaries of the work of the Municipal Corporations, Urban District Councils, and Rural District Councils). (3) Municipal Government in Scotland (contains general summaries of the work of the principal Scotch cities and towns). (4) Local Government in Ireland (contains general summaries of the work of the principal Irish cities and towns). (5) Water supply. (6) Gas supply. (7) Tramways. (8) Electricity supply. (9) Housing of the working classes. (10) Markets. (11) Telephones. (12) Baths and wash-houses. (13) Education. (14) Libraries. (15) Cemeteries. (16) Refuse and sewage disposal. (17) Local taxation returns. (18) Municipal trading. There is also a directory of the principal societies and organisations connected with the various branches of local government. The work contains a mass of useful information admirably arranged. We have often had occasion to use previous issues of the Year Book, and rarely, if ever, have looked in vain for what we expected to find.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on the 17th inst. at the Society's House, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects—viz., building new churches at Bounds Green, St. Gabriel, Middlesex, 180*l.*; Maney, near Sutton Coldfield, Warwick, 125*l.*; and Prestwich, St. Hilda, Manchester, 75*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Caerphilly, St. Martin, near Cardiff, 75*l.*; East Tilbury, St. Catherine, Essex, 20*l.*; Harpole, All Saints, near Northampton, 25*l.*; and Meshaw, St. John the Baptist, near South Molton, Devon, 5*l.* A grant was also made from the Special Mission Buildings Fund towards building a mission church at Bushey, Herts, 50*l.* The following grants were also paid for works completed:—Ruckinge, St. Mary, near Ashford, Kent, 15*l.*, balance of a grant of 35*l.*; Rock Ferry, St. Barnabas, Cheshire, 135*l.*; Accrington, St. Mary Magdalene, Lancs., 150*l.*; and Plumstead, St. Alban, Kent, 50*l.* Two hundred and thirty-one pounds was also paid from trust funds held by the Society towards the repairs of eighteen churches. The Society likewise accepted the trust of sums of money as repair funds for the churches at Anfield, St. Margaret, near Liverpool, and Kenilworth, St. John. The annual general court of the Society will be held on May 19 at the Church House, Dean's-yard, Westminster Abbey, at 3 p.m. The chair will be taken by the Lord Bishop of London.

ABERDEEN CITY IMPROVEMENTS.—The Town Council of Aberdeen discussed at a recent meeting the proposed scheme of improvements. On the motion of Lord Provost Walker, seconded by Bailie Glass, it was unanimously resolved to proceed with the Gallowgate improvements, at an estimated cost of 55,000*l.* The street will be widened to 40 ft., and a feature of the plan is the provision of a public garden. On the proposal to widen Broad-

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street between Queen-street and Union-street, at a cost of 30,000*l.*, there was a long discussion. By seventeen to sixteen the Lord Provost's motion for carrying out the widening was adopted. By the same majority the reconstruction of the Town House, at a cost of 30,000*l.*, was carried. The next portion of the scheme considered was the widening of College-street to 40 ft. between Bridge-street and Marywell-street, and the formation of a new thoroughfare from Wellington-road to Holburn-street, the estimated cost being 39,000*l.* This branch of the scheme was carried by twenty-seven to three. Application will now be made in the present session of Parliament for a Provisional Order under the Private Legislation Procedure (Scotland) Act, 1899, to carry out the proposals adopted. The total cost of these works is 154,000*l.*, but it is expected that 27,000*l.* will be realised for the feuing ground at Gallowgate and along the new road.

THE "INVICTA" LOCOMOTIVE.—The locomotive engine which Sir David Salomons has offered to present to the London County Council for erection on some site in London was, it appears, a contemporary, if not a predecessor, of the "Rocket" and of the "Locomotion," and was built by Stephenson. It was used upon the railway line from Canterbury to Whitstable that was opened in May, 1830. After a while the railway was worked by horse-power, and the "Invicta," offered for sale in 1839, was ultimately stored by the South-Eastern Railway in their works at Ashford. The locomotive runs upon two pairs of coupled wheels, 4 ft. in diameter; the boiler, 10 ft. 5 in. long by 3 ft. 4 in. diameter, contains a single flue, 20 in. in diameter; the cylinders, 24 in. long, are inclined over the leading wheels and drive the trailing wheels, and have a diameter of 10½ in.; the stroke is 18 in.; the engine is of 12 horse-power, and measures 13 ft. 6 in. in length over all.

CHAPTER HOUSE, LIVERPOOL CATHEDRAL.—A fund, estimated at 10,000*l.*, has been opened by members of the Order of Freemasons for defraying the cost of building the Chapter House which it is proposed to dedicate to the memory of the late Earl of Lathom.

ADVERTISEMENT REGULATIONS IN NEW ZEALAND.—The authorities in New Zealand appear to be adopting a most spirited and enlightened line of action in regard to checking the disfigurement of cities or sites by advertisement—affording an example which might well be taken to heart by the Government and by local authorities at home. The Municipal Corporation Amendment Act, passed last November, contains a provision enabling municipal councils to make by-laws "for regulating, controlling, or prohibiting the display upon, or over, public buildings, walls, fences, lamp-posts, pavements, or hoardings, situated in, or upon, or adjoining any land or street the property of the Corporation or under the control of the Council, or the display in any manner so that it shall be visible from any street or public place of posters, placards, handbills, writings, pictures, or devices for advertising or other purposes." The Police Offences Amendment Act, which became law the month before, included the following regulation:—"Every person who, without the special permission first had and obtained of the Commissioners of Crown Lands, of the local authority, or of the controlling authority of any educational or other public reserve, as the case may require (the proof of which permission shall rest on the person claiming to act thereunder), paints, carves, or other affixes, or displays, any letters, words, figures, or device for advertising, or other purposes, upon any land vested in the Crown or in any local authority, or upon any such reserve as aforesaid, or upon any such building, fence, or other structure erected thereon, shall for every such offence be liable to a penalty," etc. In another direction, powers of the highest importance are conferred by the Scenery Preservation Act, 1903, which provides as follows:—"The Governor may from time to time by proclamation declare that any lands so recommended to be reserved shall be inalienable unless by special Act of Parliament passed in that behalf, and no person shall cut or remove timber or in any way interfere with such lands or damage the scenic features thereof, and such lands may be fenced, preserved, and conserved intact as, and for, an inalienable patrimony of the people of New Zealand."

THE TECHNICAL INSTITUTE, NEW CROSS, LONDON.—The Goldsmiths' Company have addressed a communication to the director and staff of their Technical and Recreative Institute at New Cross intimating that the Institute will be closed by them as from September 29 of the current year. The Company have arrived at that decision, after much consideration, in view of the altered conditions imposed by the operation of the Education Act for London, whereby the supreme control of the Institute, for which they provided the site and buildings, and which they have equipped and maintained since its foundation sixteen years ago, out of their own private resources, now passes to another authority in the Metropolis. Reviewing their position, the Company feel that they are consequently unable successfully to continue as heretofore the important and independent work of their Institute, which, at the time of its establishment, constituted the only technical school after its kind in southern London. They are of opinion that it is not possible for a purely voluntary institution supported by a private body to compete successfully with institutions maintained at the public expense out of the funds which have lately become available for that purpose in London. The present buildings at New Cross were opened by the King, then Prince of Wales, on July 22, 1891, and were erected after the plans and designs of Mr. J. Wornham Penfold, architect, and surveyor to the Goldsmiths' Company. They include the old buildings of the Royal Naval School erected in 1842-3 which, with 7 acres of land, the Company purchased and extended for their later uses.

WAR MEMORIAL, EXETER.—A tablet is to be placed in the Drill Hall, Exeter, on which is inscribed the names of the men of the 1st Volunteer Battalion of the Devonshire Regiment who volunteered for service in South Africa during the war. The work has been executed by Messrs. Harry Hems and Sons, of Exeter.

"OLD" OXFORD AND ITS WORTHIES.—Supplementing the project which was accomplished, and with considerable success, at Cambridge some years ago, a consultative Committee, of which the President of Magdalen is chairman, have made arrangements for holding exhibitions at Oxford of portraits of eminent members of the University and of maps, plans, and views to illustrate the topographical and architectural history of the City and of the University buildings. The first exhibition will be opened on April 13, and will remain open until the middle of the summer term, in the East Writing School. It will consist of a series of portraits of historical personages who died before the year 1625 which are now in the possession of the University authorities, the several Colleges, and the Corporation of the City.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—According to returns furnished by seventy-five employers' associations, whose members are estimated to employ about 84,000 workpeople, and by trade unions with an aggregate membership of about 179,000, employment generally continues dull and much the same as a month ago. Compared with a year ago it is rather worse. Employment with bricklayers is reported as dull generally and much the same as last month, but worse than a year ago. With masons employment was fair in England, but worse than either a month or a year ago; in Scotland it was dull and much the same as in January last and in February, 1903. With carpenters and joiners, painters, slaters, and tilers it was dull generally, but in the case of the painters there was a slight improvement as compared with a month ago. The percentage of unemployed trade union carpenters and joiners at the end of February last was 6·9, compared with 7·7 at the end of January and 5·0 at the end of February, 1903. The percentage of unemployed trade union plumbers at the end of February was 9·3, the same percentage as at the end of January, compared with 8·2 per cent. a year ago.—*Labour Gazette.*

Legal.

ENDANGERING THE THAMES TUNNEL.

IN the Chancery Division on the 18th inst. Mr. Justice Farwell delivered judgment in the case of the East London Railway Co. *v.* the Conservators of the River Thames.

In this case the plaintiffs sought an injunction to restrain the defendants from dredging, etc., the bed of the Thames so close to the crown of the Thames Tunnel as to endanger its safety. What the defendants proposed to do to improve the trade of the port of London was to deepen the channel so that vessels of a larger size could come up as far as London Bridge. The plaintiffs' case was that the defendants, in order to accomplish that, were dredging the bed of the river, and intended to go so near the crown of the tunnel that it was not improbable water might break in and flood it and probably Rotherhithe as well.

The defendants' case was that under their statutory powers they were entitled to carry out the necessary works for improving the river's navigation, and they said that if the plaintiffs were afraid of their tunnel they ought to take steps to strengthen its construction.

His Lordship, in giving judgment, said it was absurd to suppose that plaintiffs, who had gone to enormous expense to acquire and work traffic through the tunnel should have that all taken away by the operation of the defendants. The plaintiffs had obtained Parliamentary sanction to construct a line through the tunnel for the public benefit, and, if the tunnel was rendered useless by flooding, the object of the Legislature would be defeated. He accordingly granted the injunction as asked.

Mr. Upjohn, K.C., and Mr. Waggett appeared for the plaintiffs; and Mr. Butcher, K.C., and Mr. Northcote for the defendants.

POINT UNDER THE METROPOLIS MANAGEMENT ACT.

MR. JUSTICE CHANNELL, in the King's Bench Division on the 19th inst., delivered judgment in the case of Heaver's Executors *v.* the Mayor, etc., of Fulham.

In this case the plaintiffs brought the action for an injunction to restrain the defendants from entering No. 29, Rosebery-road, Fulham, and in any way interfering with the drains and sewers in the premises for the purpose of converting them into a drain or sewer. The plaintiffs also asked for a declaration that the drain on their premises was a sewer within the Metropolis Management Act.

The facts giving rise to the action were shortly as follows:—In February, 1903, the plaintiffs were served by the defendants with a notice requiring them to abate a nuisance arising from a drain on the premises in question. A question then arose as to whether the drain was a sewer, and, as the County Council declined to decide the question, the defendants, for the purpose of getting the question decided, served the plaintiffs with a notice under section 53 of the Metropolis Management Act requiring them to disconnect the drain of No. 27 from the drain of No. 29 Rosebery-road. The plaintiffs then brought the present action, alleging that, as the drain carried the drainage of the two houses, it was a sewer, which was repairable by the defendants. The plaintiffs also contended that the drain was a sewer on the further ground that it carried the rain water from the roof of another house in the same road.

His Lordship, in the course of delivering a lengthy judgment, said he thought on the facts that the drain in question was a combined drainage done under the sanction of the Vestry, and on that ground he came to the conclusion that the drain was not a sewer. He said there was no necessity for him to deal with the question of the water gully, as there was no evidence that the drain was out of repair beyond the point where the gully carrying off the water from the roof of No. 31 joined the drain of No. 29. He did not intend to make any declaration with regard to the drain beyond the point of the connexion with that gully. He would, however, have hesitated a long time before deciding that because a rain-water gully carried away the rain water from the roofs of two houses that gully became a sewer. With regard to the service by the defendants of a notice under section 83 of the Act, he thought the defendants were wrong in so doing, as that section only applied to the service of the notice on the wrongdoer himself, in this case the late Mr. A. Heaver (the owner and builder). The plaintiffs would have been entitled to a declaration on that point, but as the proceedings had been taken mainly for the purpose of deciding whether or not the drain was a sewer, the defendants had succeeded on the main question. He, therefore, made a declaration that the structure down to the point where the water gully came in was not a sewer, and that the notice of July 31 was a bad notice. The defendants would have the costs of the action, but they must pay the plaintiffs the costs of having obtained an interlocutory injunction.

Order accordingly.

A stay of execution was granted with the view to an appeal.

Mr. Boxall, K.C., and Mr. Mayer appeared for the plaintiffs; and Mr. Danckwerts, K.C., and Mr. Courthorpe Munroe for the defendants.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

4,038 of 1903.—B. J. B. MILLS (A. Seigle): *Artificial Building Materials.*

A process for the manufacture of artificial stones, or the like, in which the mixture, composed of silicious sand, lime, or other analogous

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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materials is finally petrified by steam under pressure, such process being characterised by a preliminary and careful mixing of the sand and lime with a solution of chloride of calcium and of oxide of zinc; that is to say, capable of insuring, without artificial heating, the formation of an oxichloride of suitable composition, containing essentially calcium and zinc.

4,224 of 1903.—G. DEVENISH: *A Raft.*

A raft, consisting of a folding platform of strips of wood with notches and concentric edges, mounted on a central rod and held together thereby in conjunction with rods, guards, and floats, with runners and a keel, having at its ends a propeller, with its motor steering-gear fixed to its upper edge seat.

4,812 of 1903.—H. S. PALMER: *Machines for Moulding Hollow Concrete Building Blocks.*

The object of this invention is to provide a machine for the manufacture of building blocks from concrete and similar mixtures. The main frame comprises standards and a bed-plate, the latter having an elongated opening to permit adjustment of the cores. On the sides of the bed-plate are pairs of lugs pivoted to lugs carried by swinging side-plates. The ends of the bed-plate carry lugs pivoted to removable end-plates, one of the latter being arranged so that its pivot pintles may be removed to adjust the plate in position or to substitute a larger plate for the manufacture of corner blocks.

7,729 of 1903.—J. E. VARLEY and J. WILBY: *Means for Securing Sash Lines or Cords to Window Sashes or Sliding Frames.*

A sash line or cord fastening adapted to be readily attached to or disconnected from the sash stile, comprising a socket or cylinder having a contracted opening at its upper end, and screw threaded internally to receive a screwed plug or stud, or screw threaded externally to receive a screwed cap or sleeve having a contracted opening at its upper end.

8,934 of 1903.—A BROWN: *Dust, Draught, and Rain Excluder for Doors.*

This invention relates to a dust, draught, and rain excluder for doors. In carrying out the invention a strip or framing of metal or wood is attached to the door, at the bottom thereof, running across the width of the door; the lower edge of the said strip or framing being provided with a strip of rubber. The framing is prevented from moving laterally by means of screws fastened through the said framing to the door, but the framing may move vertically by an arrangement of vertical slots. Connected to the framing, at each end thereof, are two bell-crank levers, the lower ends of which are connected to the framing and the upper ends to a rod which works within guides on the door. One end of the said rod is connected by means of a pin to a lever, which is caused to abut against a screw fastened in the side of the frame of the door, so that, when the door is closed, the said screw forces the rod to move laterally, which has the effect of forcing the rubber strip down to the flooring, thereby closing any gap between the flooring and the bottom of the door. In order to bring the rod before referred to back again to its normal position, a spiral or other spring is preferably mounted on the rod.

9,036 of 1903.—J. MONK: *Shelters, Kiosks, and the like.*

This relates to shelters, kiosks, and the like which contain, or may be provided with, seats, and their main objects are to enable a great seating accommodation to be obtained upon any given floor or ground area and to provide a great amount of shelter against winds and storms. In carrying the invention into effect the shelter, or kiosk, is formed with three or more partitions, walls, or equivalents, which extend from the centre or from about the centre of the shelter to its outer edge or edges, or nearer to or in the direction of the outer edge or edges. These partitions may be regularly disposed, and have seats arranged along either one or both sides of each or any or all of them, as well as between the nearer ends of adjacent partitions if desired.

9,178 of 1903.—H. BROCKLESBY and S. GRATRIX, JUN., and BROTHER, LTD.: *Flushing Cisterns for Water-closets and the like.*

This consists in the combination, with flushing cisterns for water-closets and the like, of a cylinder, a loose-fitting piston within such cylinder, a non-return valve within the piston, and the said piston so connected to the cistern-outlet valve as to be moved to the opposite end of the cylinder when such valve is raised, and gradually return to its original position, the rate of return being such that the outlet valve comes to its seating before the cistern is fully drained.

9,384 of 1903.—C. J. FOOKS: *Casement Stays for Windows.*

According to this invention a long perforated metallic stay is loosely hinged or pivoted at one end on a counter-sunk back-plate, and at the other end of the said perforated stay a handle is formed. This said end, when the window is closed, falls into a square opening or socket cut in a projecting plate screwed to the bottom rail of the window. It also falls into a square opening or recess formed in a metallic projecting block which is screwed on to the side of the window frame.

24,744 of 1903.—C. F. HILKIER: *Thermometric Devices particularly adapted for Giving an Alarm in case of Fire or of a Sudden Increase in Temperature.*

A thermometer for indicating a sudden increase of temperature, characterised by a U-shaped tube sealed at both ends, the branches of the said tube being partially filled with mercury, above which is placed some volatile liquid, one branch being insulated from radiant heat, while the other is adapted to be acted upon directly by such heat.

25,078 of 1903.—O. M. EDWARDS: *Windows.*

A window, consisting in the combination of a guide-way, a sash adapted to move in the guide-way, holding devices adapted to bear against the sash at different points, one of which is provided with a movable part having a bevelled bearing surface and actuating means therefor, and a co-acting portion arranged substantially in the direction the sash moves, with which such movable part may frictionally bear, whereby the sash may be released from the holding action of such movable part when the actuating means are actuated in one direction.

25,769 of 1903.—A. MCGOWAN DENHAM: *Stoves.*

A stove, consisting in the combination of a heating and radiating surface forming the body of the stove, a reservoir for containing water located above said body, an illuminant placed between said body and said reservoir to generate heat in the latter, and means for conveying said heat to said body and for supporting said reservoir.

26,506 of 1903.—M. E. BLACKWOOD: *Coverings for Fireplaces for Use whilst Sweeping Chimneys.*

This invention relates to coverings for fireplaces for use whilst sweeping chimneys, and consists of a frame which is made in three parts so as to form three sides of a square, and joined together with hinges so as to be easily folded up. The frame may be made of strips of wood, or iron, or other suitable material, and is so made that it will expand in length and width, which is done by having slots in the strips, and connected by means of small iron bolts and thumb-nuts. By this means it is made to fit any fireplace. The frame is then covered with a sheeting of cotton or any similar fabric, and preferably of a black colour.

28,513 of 1903.—O. CHRISTIANSEN: *Cowl for Flues, Pipes, or Chimneys.*

Draught pipes and chimneys, characterised by the arrangement of an upper rotatable cowl and a number of channels at the lower part of the pipe or chimney-top projecting above the roof, which channels ascend at a slope from without and end in the interior of the pipe or chimney-top in order to prevent down-strokes of wind and to produce an effective draught in the pipe or chimney.

1,418 of 1904.—C. W. TREWEEK: *Flushing Tanks or Cisterns.*

Flushing tanks or cisterns, consisting of a reservoir formed at one end of the same and fitted with a valve operated by the ball-valve lever for permitting an inrush of the water from the tank to the reservoir, which water, acting upon the ball in the latter, quickly closes the ball valve.

1,580 of 1904.—H. HALL: *A Facing Tile.*

This invention has for its object a facing tile which is so formed that, when a number of them are fixed to a wall or other support, they shall leave a regular or uniform space around and between their front edges to enable a cement joint to be made between them. They are also provided with distance pieces of such a form on the face of one or the other of their overlapping parts that such distance pieces shall cut through the mortar or cement used in fixing the tiles, thereby enabling the latter to be readily fixed in a uniform plane. The back of the tile has recesses formed therein, between which the ribs of V-shaped cross section, the apices of which are on or about a level with the back face of the tile, and elongated holes are formed through the flange to enable nails, when required, to be passed therethrough at such positions as will enable the nails to obtain a good hold.

1,858 of 1904.—H. SMITH: *Adjustable Hinges for Doors, applicable to Buildings, Gates, Railway Carriages, and the like.*

This invention relates to adjustable hinges for doors. In carrying the invention into practice a flat metallic plate is constructed, and on each side a pivot-pin is fixed, and at convenient positions holes are drilled and tapped. In each corner is a counter-sunk screw-hole for fixing the plate by means of counter-sunk screws to any woodwork or to any other material. To the pins links or bars are secured. The ends of the said links or bars are attached to pivot-pins fixed to the front of a hinge, all loosely pivoted. The front of the hinge is provided with two longitudinal slots and at its end with the usual knuckle-joint and strap. The front of the hinge is adjusted to the plate by means of bolts (through the slots) being screwed into the holes.

7,637 of 1903.—W. H. OSBORN: *Fire Chamber of a Domestic Fire Grate or the like.*

A renewable fire-brick or like slab or block internally formed hollow, for use within the fire chamber of a domestic grate, or with a number of communicating air passages proceeding from an opening in the underside of the said block or slab, and discharging into exit holes which are sufficiently high up in the block or slab to lead over the top of or into the fire in the fire chamber.

8,862 of 1903.—J. TILLEY: *Machinery for Boring and Dowelling Wood Blocks for Flooring and like purposes.*

Machinery for boring and dowelling wood blocks for flooring and like purposes, characterised by four boring tools mounted to slide upon a bed and actuated by a cam movement in combination with a feed through the bed and a cam-lifted rod for raising the blocks ready for boring and at the same time removing the previous block.

9,707 of 1903.—W. D. CAY: *Construction of Piers, Breakwaters, and other structures.*

According to this invention piers, breakwaters, and other structures are constructed of blocks by rolling them into position. For this purpose the blocks are made of cylindrical or other form, such that they can be rolled from place to place, or they have fixed to or formed upon them suitable surfaces to support them whilst being rolled. The ends of the block may have trunnions fixed in them to facilitate handling and for securing them either temporarily or permanently.

26,751 of 1903.—W. MORRIS: *Brick Kilns.*

Brick kilns, the building of all flues practically on one level, consisting in the arrangement by which the hot products of combustion from a previous kiln pass directly into the one side of the juxta kiln, pass up the ashes holes, fire holes, and fire bags on that side only, being exhausted on the opposite side of said kiln through louvres in a steam flue running the length of the kiln, together with the special arrangement and construction of damper slides in the flues and the special use of dampers in conjunction with the said ashes holes.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 14.—By BEALE & CAPPS.

Notting Hill.—2, Silchester-rd. (s.), u.t. 37¼ yrs., g.r. 10*l.*, e.r. 55*l.*	£380
35, Lansdowne-rd., u.t. 38¼ yrs., g.r., etc., 17*l.* 2s., y.r. 70*l.*	550

By FULLER, MOON, & FULLER.

Kenley, Surrey.—"The Firs" and 1 acre, f., e.r. 100*l.*	1,680

By KEMSLEYS'.

Woodford.—5, Derby-villas, f., e.r. 25*l.*	315
Romford, Essex.—Market-pl., the "Pig in the Pound" b.h., and two cottages adjoining, f., y.r. 74*l.* 4s.	900
Walthamstow.—Chingford-rd., "High House," f., y.r. 30*l.*	920

By WEATHERALL & GREEN.

Bloomsbury.—Endell-st., f.g.r. 100*l.*, reversion in 13¼ yrs.	4,250
Soho.—35 to 49 (odd), Shaftesbury-av.; 57 to 75 (odd), Wardour-st.; 25 to 31, Rupert-st.; 7 to 11, Upper Rupert-st., area 23,406 ft., building lease for 80 yrs., let at per ann.	7,300

By BALCH & BALCH (at Camden Town).

Kentish Town.—12, Galsford-st., u.t. 44 yrs., g.r. 8*l.*, y.r. 50*l.*	515

March 15.—By C. H. BROWN.

Pimlico.—5, Winchester-st., u.t. 24 yrs., g.r. 9*l.*, y.r. 65*l.*	450
6, Moreton-pl., u.t. 25¼ yrs., g.r. 8*l.*, y.r. 50*l.*	400

By DAVID BURNETT & CO.

Hounslow.—34 and 40, Bulstrode-rd., f., y.r. 95*l.*	1,300

By FREDERICK WARMAN.

West Kensington.—38, Comeragh-rd., u.t. 72 yrs., g.r. 10*l.*, e.r. 52*l.*	370
Hackney.—16 and 17, Andrews-rd., and 1A, Antwerp-st., u.t. 31¼ yrs., g.r. 6*l.*, w.r. 83*l.* 4s.	330

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53, Southborough-rd., u.t. 49¼ yrs., g.r. 5*l.*, y.r. 39*l.* £355
Mile End.—45 and 47, Devonshire-rd., u.t. 17¼ yrs., g.r. 4*l.*, w.r. 58*l.* 10s. 195
Leyton.—144 and 170, South Birkbeck-rd., f., w.r. 57*l.* 4s. 445

By E. FOX & BOUSFIELD, in conjunction with MONTAGU & ROBINSON.

City of London.—17½, Addle-st. (warehouse), area 790 ft., f., y.r. 395*l.* 4,000
62, Cannon-st., and 25, College-hill (shop and offices), area 1,228 ft., f., y.r. 630*l.* .. 13,000
19, 21, and 23, Ludgate-hill, and 1, Ludgate-sq., with "St. Paul's-chambers" (shops and offices), area 3,580 ft., u.t. 54 yrs., g.r. 633*l.*, y.r. 3,165*l.* 20,000
Kensington.—25 to 39 (odd), Church-st. (s.), f., y.r. 1,170*l.* 28,650
Shoreditch High-st.—No. 149A (workshops, factory, etc.), area 6,500 ft., f., y.r. 170*l.* .. 2,800
Poplar.—1 and 2, Montague-pl., f., y.r. 80*l.* .. 1,300
3, Montague-pl. (factory, etc.), f., y.r. 80*l.* .. 1,300
Southwark.—132, Southwark-st. (warehouse), area 880 ft., f., y.r. 150*l.* 2,000

March 16.—By FRANCIS DOD & CO.

Wood Green.—1, 3, and 5, Lyndhurst-rd., f., w.r. 101*l.* 8s. 1,110
42, Palace-rd., f., e.r. 45*l.* 680
Palace-rd., a freehold building site 470
Tottenham.—38, Durham-rd., f., e.r. 28*l.* 360
Harringay.—138 and 140, Fairfax-rd., u.t. 85½ yrs., g.r. 10*l.*, y.r. 56*l.* 430
Edmonton.—459 and 469, Fore-st. (s.), u.t. 72½ yrs., g.r. 10*l.*, y.r. 85*l.* 1,000
Wood Green.—5 and 6, Byron-villas, u.t. 76 yrs., g.r. 14*l.*, y.r. 72*l.* 665

By FOSTER & CRANFIELD.

Plumstead, Kent.—31 and 43, Herbert-rd. (shop and livery stables), f., y.r. 120*l.* 10s. 2,100

By G. FUTVOYE FRANCIS.

Pimlico.—10, Rutland-st., u.t. 20½ yrs., g.r. 8*l.*, y.r. 46*l.* 310

By HUMBERT & FLINT.

Soho.—17 and 18, Rupert-st. (s.), area 1,200 ft., f., y.r. 350*l.* 6,800
Hammersmith.—St. Paul's-cres., etc., f.g.r. 300*l.*, reversion in 93¼ yrs. 7,000
Wood Green.—Victoria-rd., f.g.r. 46*l.* 10s., reversion in 94 yrs. 980

By RUSHWORTH & STEVENS.

Pall Mall.—Nos. 50, 50A, and 51, f.g. rents 120*l.*, reversion in 854 yrs. 3,520
Pall Mall-pl., f.g. rents 108*l.* 4s., reversion in 854 yrs. 3,090

By WM. WESTON.

Paddington.—109 and 109A, Westbourne Park-rd. (s.), u.t. 52 yrs., g.r. 8*l.*, y.r. 90*l.* 900

By E. FOX & BOUSFIELD, in conjunction with MONTAGU & ROBINSON.

City of London.—89 and 90, Milton-st. (warehouses), area 1,380 ft., f., y.r. 325*l.* 4,825
51 and 53, Moor-la. (warehouse), area 1,230 ft., f., y.r. 300*l.* 3,750
Southwark.—136, Southwark-st. (warehouse), area 700 ft., f., y.r. 120*l.* 1,625
City of London.—24, Warwick-la. (warehouse), area 640 ft., u.t. 52¼ yrs., g.r. 110*l.*, y.r. 330*l.* 1,100
13, Garlick-hill, and 1, Sugar Loaf-ct. (factory), area 2,680 ft., u.t. 32¼ yrs., g.r. 82*l.*, y.r. 350*l.* 2,750
Marylebone.—54, Baker-st. (s.), u.t. 18 yrs., g.r. 100*l.*, y.r. 400*l.* 2,275
Oxford-street.—No. 362 (s.), Corporation lease, g.r. 3*l.*, y.r. 250*l.* 7,600
No. 364 ("The Clarendon" p.h.), Corporation lease, g.r. 3*l.*, y.r. 200*l.* 8,050
13, Stratford-pl., part freehold and part Corporation lease, g.r. 5*l.*, y.r. 200*l.* 7,000
Euston-road.—18, Endsleigh-st., u.t. 19½ yrs., g.r. 30*l.*, y.r. 110*l.* 650
Strand.—1, Southampton-st., and 1, Exeter-st. (s.), area 1,060 ft., u.t. 25½ yrs., g.r. 24*l.* 3s., y.r. 270*l.* 3,025
2, Southampton-st., and 2, Exeter-st. (offices), area 1,080 ft., u.t. 25½ yrs., g.r. 24*l.* 3s., y.r. 270*l.* 3,000
Finsbury.—1 and 3, Sun-st. (warehouse), area 1,470 ft., u.t. 59 yrs., g.r. 110*l.*, y.r. 450*l.* 4,000
39, Wilson-st. (warehouse), area 1,140 ft., u.t. 59 yrs., g.r. 83*l.* 14s., y.r. 216*l.* 1,950
Maida Vale.—2 and 4, Randolph-cres., u.t. 62½ yrs., g.r. 42*l.*, y.r. 240*l.* 2,100
47 and 49, Warwick-road, u.t. 46½ yrs., g.r. 40*l.*, y.r. 150*l.* 890

March 17.—By H. J. BLISS & SONS.

Bethnal Green.—51, Auckland-rd., f., w.r. 33*l.* 16s. 500
Bow.—50, Milton-rd., f., w.r. 36*l.* 8s. 450
Mile End.—107, Devonshire-street, w.r. 33*l.* 16s., also l.g.r. 6*l.*, u.t. 27½ yrs., g.r. 11*l.* 170

By W. J. GARDNER.

Gray's Inn-road.—31, Ampton-st., u.t. 10½ yrs., g.r. 7*l.*, y.r. 45*l.* 155
43, Frederick-st., u.t. 10½ yrs., g.r. 7*l.*, y.r. 52*l.* 10s. 160
Kennington.—23, Hanover-gdns., u.t. 41½ yrs., g.r. 4*l.*, e.r. 36*l.* 315

By PHIBBS, GIBSON, & CO.

Herne Hill.—49 and 51, Gubyon-av., u.t. 71 yrs., g.r. 18*l.*, e.r. 110*l.* 850

By NEWBON, EDWARDS, & SHEPHARD.

Hoxton.—8, Hoxton-sq. (warehouse), u.t. 63 yrs., g.r. 50*l.*, y.r. 170*l.* 1,100
Islington.—138, Liverpool-rd., f., y.r. 52*l.* 600
13, Dean-st., u.t. 23 yrs., g.r. 4*l.* 4s., w.r. 55*l.* 18s. 200
Caledonian-road.—24, Market-rd., u.t. 49 yrs., g.r. 6*l.*, y.r. 36*l.* 355
Canonbury.—5 and 6, St. Mary's-rd., u.t. 41 yrs., g.r. 20*l.*, y.r. 110*l.* 995
Kentish Town.—6, Leighton-cres., u.t. 37 yrs., g.r. 8*l.* 10s., y.r. 52*l.* 10s. 355
Fulham.—796 and 798, Fulham-rd. ("Vicarage Farm Dairy" and "Holcroft Laundry"), u.t. 81½ yrs., g.r. 14*l.*, y.r. 65*l.* 980

By STIMSON & SONS.

Anerley.—174 and 176, Anerley-rd., also "Seymour Nursery," u.t. 26½ yrs., g.r. 24*l.*, y.r. 144*l.* £620
Norwood.—Upper Beulah Hill, l.g.r. 44*l.*, u.t. 59 yrs. g.r. 1*l.* 690
Marylebone.—130 to 136 (even), Carlisle-st., u.t. 17½ yrs., g.r. 16*l.*, w.r. 148*l.* 4s. 460
Croydon.—14 to 18, Fullerton-rd., u.t. 76 yrs., g.r. 20*l.*, e.r. 126*l.* 2s. 455
Shortlands, Kent.—55 to 61 (odd), Recreation-rd., u.t. 74½ yrs., g.r. 16*l.*, w.r. 78*l.* 425
Camberwell.—17, Graces-rd., u.t. 55 yrs., g.r. 5*l.* 10s., y.r. 33*l.* 300

March 18.—By HOWELL, SON, & BONNIN.

South Kensington.—86, Earl's Court-rd., u.t. 50 yrs., g.r. 1*l.*, p. 4,025

By F. VARLEY & SON.

Finsbury Park.—293, Green-lanes, u.t. 53 yrs., g.r. 15*l.*, p. 1,500
37, Gloucester-rd., u.t. 56 yrs., g.r. 13*l.* 13s., p. 820
Stoke Newington.—103, Bethune-rd., u.t. 86 yrs., g.r. 12*l.*, e.r. 75*l.* 810

Contractions used in these lists.—**F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; h.p. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.**

MEETINGS.

FRIDAY, MARCH 25.

Institution of Civil Engineers (*Students' Meeting*).—Mr. J. M. Kennedy on "The Relative Advantages of Continuous and Alternating Current for Traction Purposes." 8 p.m.

Royal Institution.—Professor Dewar on "Liquid Hydrogen Calorimetry." 9 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Mr. J. E. Worth on "Sewage Disposal." 7 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. W. H. Baxter on "Some Woodworking Tools and their Economic Working." 8 p.m.

SATURDAY, MARCH 26.

Sanitary Institute (*Sessional Meeting*).—Mr. W. E. Riley, Architect to the L.C.C., on "Municipal Re-Housing." 11 a.m. Visit in the afternoon to L.C.C. Bourne Estate, Clerkenwell-road, and Cottage Estate, Tottenham.

Royal Institution.—Right Hon. Lord Rayleigh, M.A., on "The Life and Work of Stokes," VI. 3 p.m.

Sanitary Institute (*Demonstrations for Sanitary Officers*).—Inspection at the Sewage Outfall Works, Barking. 3 p.m.

Edinburgh Architectural Association.—Visit to Gothic Ironworks, Falkirk.

Builders' Foremen's Association (*Memorial Hall, Farringdon-street*).—Mr. E. Willis on "Drainage, with the Practical Use of the Surveyor's Level." 8.30 p.m.

MONDAY, MARCH 28.

The Royal Institute of British Architects.—Mr. C. Stanley Peach on "The Design and Construction of Buildings Connected with the Generation and Supply of Electricity known as Central Stations," with Lantern Illustrations, and Working and Detail Drawings. 8 p.m.

Regent-street Polytechnic (*University Extension Lectures*).—Professor Vivian Lewes on "The Chemistry of Air, Fire, and Water," IX. 8 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Mr. J. E. Worth on "Scavenging, Disposal of House Refuse." 7 p.m.

Builders' Benevolent Institution.—Committee Meeting. 5 p.m.

TUESDAY, MARCH 29.

Institution of Civil Engineers.—(1) Mr. L. H. Savile on "Lowering the Sill of the Ramsden Dock, Barrow-in-Furness"; and (2) Mr. R. Henderson on "Burntisland Harbour: Construction of the East Dock." 8 p.m.

WEDNESDAY, MARCH 30.

Architectural Association Discussion Section.—Mr. G. P. Bankart on "Leadwork." 7.30 p.m.

Sanitary Institute (*Demonstrations for Sanitary Officers*).—Inspection of a house in Stoke Newington. 3 p.m.

Edinburgh Architectural Association.—Mr. T. Ross, F.S.A., Scot., on "The Remains and Evidences of Roman Architecture in Scotland." 8 p.m.

TO CORRESPONDENTS.

R. C. C.—H. S. (Amounts should have been stated).

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BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	,, ,, ,,
Facing Stocks ...	2 12 0	,, ,, ,,
Shippers	2 10 0	,, ,, ,,
Flettons	1 10 0	,, at railway depôt.
Red Wire Cuts ...	1 13 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing	5 0 0	,, ,, ,,
Best Blue Pressed Staffordshire ...	4 4 0	,, ,, ,,
Do. Bullnose	4 10 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 8 0	,, ,, ,,
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats.....	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers...	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamferred, Squints.	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats.....	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers...	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamferred, Squints	14 0 0	,, ,, ,,
Second Quality, White and Dipped Salt Glazed	2 0 0	,, less than best.

	s. d.	
Thames and Pit Sand.....	7 3	per yard, delivered.
Thames Ballast.....	6 0	,, ,,
Best Portland Cement	30 0	per ton, ,,
Best Ground Blue Lias Lime	21 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	,, ,,
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 1	,, ,,
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 2½	,, ,,

	s. d.	
Ancester in blocks.....	1 11	per ft. cube, deld. rly. depôt.
Beer ,, ...	1 6	,, ,,
Greenshill ,, ...	1 10	,, ,,
Darley Dale in blocks...	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 0	,, ,,
Red Mansfield ,,	2 4	,, ,,

YORK STONE—*Robin Hood Quality.*

	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. ,,
6 in. rubbed two sides ditto, ditto	2 6	,, ,,
3 in. sawn two sides slabs (random sizes)	0 11½	,, ,,
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	,, ,,
1½ in. to 2 in. ditto, ditto	0 6	,, ,,
HARD YORK—		
Scappled random blocks	3 0	per ft. cube ,,
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. ,,
6 in. rubbed two sides Ditto	3 0	,, ,,
3 in. sawn two sides (slabs random sizes)	1 2	,, ,,
2 in. self-faced random flags	0 5	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 ,, ,,	13 17 6	,, ,,
20 × 10 best seconds ,,	12 15 0	,, ,,
20 × 12 ,, ,, ,,	13 10 0	,, ,,
16 × 8 ,, ,, ,,	7 0 0	,, ,,
20 × 10 best blue Portmadoc	12 12 6	,, ,,
16 × 8 best blue Portmadoc	6 12 6	,, ,,

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SLATES—(*continued*).

				Per 1000 of 1200 at r. d.
20 × 10 best Eureka unfading green	15	2	6	,, ,,
20 × 12 ,, ,,	17	2	6	,, ,,
18 × 10 ,, ,,	12	10	0	,, ,,
16 × 8 ,, ,,	10	5	0	,, ,,
20 × 10 permanent green	11	10	0	,, ,,
18 × 10 ,, ,,	9	10	0	,, ,,
16 × 8 ,, ,,	6	10	0	,, ,,

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depôt.
Hip and Valley tiles	3	7	per doz. ,, ,,
Best Brosely tiles	50	0	per 1000 ,, ,,
Do. Ornamental tiles	52	6	,, ,, ,,
Hip and Valley tiles	4	0	per doz. ,, ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000 ,, ,,
Do. Ornamental do	60	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	0	,, ,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 ,, ,,
Do. Ornamental do	54	6	,, ,, ,,
Hip tiles	4	1	per doz. ,, ,,
Valley tiles	3	8	,, ,, ,,
Best "Rosemary" brand plain tiles	48	0	per 1000 ,, ,,
Best Ornamental tiles	50	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	8	,, ,, ,,
Best "Hartshill" brand plain tiles, sand faced.	50	0	per 1000 ,, ,,
Do. pressed	47	6	,, ,, ,,
Do. Ornamental do	50	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	6	,, ,, ,,

WOOD.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15	10	0	16	10	0
Deals: best 3 by 4	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0	12	10	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less thn best		
Battens: seconds	0	10	0	,, ,, ,,		
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	9	10	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0
Foreign Sawn Boards—						
1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.		
¼ in.	1	0	0	,,		
Fir timber: best middling Danzig or Memel (average specification)	At per load 4	of 50 ft. 10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft. average)	3	5	0	3	15	0
JOINERS' WOOD.						
White Sea: first yellow deals,	At per standard.					
3 in. by 11 in	23	0	0	24	0	0
3 in. by 9 in.	21	0	0	22	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	18	10	0
Second yellow deals, 3 in. by 11 in.	18	10	0	20	0	0
,, ,, 3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	15	10	0	16	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Petersburg: second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	10	0	14	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg:—						
First white deals, 3 in. by 11 in.	14	10	0	15	10	0
,, ,, 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
,, ,, 3 in. by 9 in.	12	10	0	13	10	0
,, ,, battens	9	10	0	10	10	0
Pitch-pine: deals	16	10	0	20	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	35	0	0	upwards.		
Oddments	24	0	0	26	0	0
Seconds, regular sizes	26	10	0	28	10	0
Yellow Pine oddments	22	0	0	24	0	0
Kauri Pine—Planks, per ft. cube	0	3	6	0	5	0
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	2	6	0	3	6
Small ,, ,,	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube.	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	7	0	0	8
¼ in. do. do.	0	0	6½		—	
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	21	0	0
American Whitewood Planks— per ft. cube	0	4	0		—	
Prepared Flooring—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	0	16	6

WOOD—(*continued*)—

	Per square. £	s.	d.	£	s.	d.
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
¾ in. by 7 in. do. do. do.	0	14	0	0	18	0
1 in. by 7 in. white do. do.	0	10	0	0	11	6
1 in. by 7 in. do. do. do.	0	11	6	0	13	6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	6	5	0	7	5	0
Compound Girders, ordinary sections	8	2	6	9	5	0
Angles, Tees and Channels, ordinary sections	7	17	6	8	17	6
Flitch Plates	8	5	0	8	15	0
Cast Iron Columns and Stanchions including ordinary patterns	7	2	6	8	5	6

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON—						
Common Bars	7	5	0	7	15	0
Staffordshire Crown Bars, good merchant quality	7	15	0	8	5	0
Staffordshire "Marked Bars"	10	0	0		—	
Mild Steel Bars	8	15	0	9	5	0
Hoop Iron, basis price	9	5	0	9	10	0
,, ,, Galvanized	17	10	0		—	
("And upwards, according to size and gauge.)						
Sheet Iron (Black)—						
Ordinary sizes to 20 g.	9	15	0		—	
,, ,, 24 g.	10	15	0		—	
,, ,, 26 g.	12	5	0		—	
Sheet Iron, Galvanised, flat, ordinary quality—						
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12	15	0		—	
Ordinary sizes to 22 g. and 24 g.	13	5	0		—	
,, ,, 26 g.	14	5	0		—	
Sheet Iron, Galvanised, flat, best quality—						
Ordinary sizes to 20 g.	16	0	0		—	
,, ,, 22 g. and 24 g.	16	10	0		—	
,, ,, 26 g.	18	0	0		—	
Galvanised Corrugated Sheets—						
Ordinary sizes 6 ft. to 8 ft. 20 g.	12	10	0		—	
,, ,, 22 g. and 24 g.	13	0	0		—	
,, ,, 26 g.	13	15	0		—	
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11	15	0		—	
Best Soft Steel Sheets, 22 g. & 24 g.	12	15	0		—	
,, ,, ,, 26 g.	14	0	0		—	
Cut nails, 3 in. to 6 in.	9	0	0	9	10	0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3lb. and up	14	15	0		—	
Pipe in coils	15	5	0		—	
Soil pipe	17	15	0		—	
Compo pipe	17	15	0		—	
ZINC—Sheet—						
Vieille Montagne ton	26	5	0		—	
Silesian	26	0	0		—	
COPPER—						
Strong Sheet per lb.	0	0	10½		—	
Thin ,, ,,	0	0	11½		—	
Copper nails ,,	0	0	11		—	
BRASS—						
Strong Sheet per lb.	0	0	10		—	
Thin ,, ,,	0	0	11		—	
TIN—English Ingots ,,	0	1	4		—	
SOLDER—Plumbers' ,,	0	0	6½		—	
Tinmen's ,,	0	0	8		—	
Blowpipe ,,	0	0	9		—	

ENGLISH SHEET GLASS IN CRATES.

	2d. per ft. delivered.		
15 oz. thirds	2d.	,,	,,
,, fourths	1½d.	,,	,,
21 oz. thirds	3d.	,,	,,
,, fourths	2½d.	,,	,,
26 oz. thirds	3½d.	,,	,,
,, fourths	3d.	,,	,,
32 oz. thirds	4½d.	,,	,,
,, fourths	4d.	,,	,,
Fluted Sheet, 15 oz.	2½d.	,,	,,
,, 21 oz.	3½d.	,,	,,
⅛ Hartley's Rolled Plate	1½d.	,,	,,
3/16 ,, ,, ,,	1½d.	,,	,,
¼ ,, ,, ,,	2½d.	,,	,,

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes or barrels	per gallon	0	1	6
,, ,, ,, in drums	,,	0	1	9
Boiled ,, ,, in pipes or barrels	,,	0	1	9
,, ,, ,, in drums	,,	0	2	0
Turpentine, in barrels	,,	0	3	8
,, in drums	,,	0	3	10
Genuine Ground English White Lead	per ton	19	0	0
Red Lead, Dry	,,	19	0	0
Best Linseed Oil Putty	per cwt.	0	7	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to J. MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder" by *Friday Morning's Post*.

PUBLISHER'S NOTICES.

Nat. Tel., 6113, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXIV. (July to December, 1903) was given as a supplement with issue of January 9 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each.

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Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE noon on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS advertising in "THE BUILDER" may have *Replies addressed to the Office*, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

TENDERS.

. Next week communications for insertion under this heading must reach us *not later than* 10 *a.m.* on Wednesday, as, owing to the Easter holidays, we go to press a day earlier than usual.

* Denotes *accepted*. † Denotes *provisionally accepted*.

AUDENSHAW.—For the erection of six dwelling-houses at Corporation-road, Audenshaw. Messrs. J. H. Burton and J. A. Percivals, architects, 150a, Stamford-street, Ashton-under-Lyne.

General Trades.

Z. Pike & Son, Hooley Hill* £1,277 12 0
(Nineteen tenders received.)

Plumbing and Glazing.

S. Morris, Denton* £144 2 0

BENGEO (Hertford).—For road works, for Mr. W. F. Parker. Messrs. Norris & Duvall, Surveyors, 60, Forestreet, Hertford:—

Smyth, White, & Co.	£3,106	4	3
W. A. Sparrow	2,915	15	0
E. Bloomfield	2,787	18	3
W. Griffiths & Co., Ltd.	2,734	8	4
A. T. Catley	2,526	0	0
Killingback & Co.	2,404	18	5
Wallace & Inns	2,387	1	6
R. Ballard, Ltd.	£2,371	0	0
G. Bell	2,162	0	0
H. W. Catchpole & Co.	2,140	16	3
W. H. Henshaw	2,075	10	5
T. Adams	2,042	15	7
J. C. Trueman	1,899	0	0
G. F. Tomlinson	1,735	0	0

BEXLEY HEATH (KENT).—Accepted for the supply of granite, flints, ragstone, and best glazed stoneware pipes, etc., for the Urban District Council. Mr. W. T. Howse, Surveyor, Council Offices, Bexley Heath:—

	Per ton. s.	d.
Granite.		
C. M. Manuelle, London	13	5
Quartzite.		
Road Maintenance and Stone Supply Co., Gravesend	11	1
Ragstone Riddlings.		
W. H. Benstead & Sons, Maidstone	6	6
Dug Flints.		
J. Barrett, Dunton Green	7	0
W. S. Harnett, Newington	6	2
Stoneware Pipes.		
T. Wragg & Sons, Swadlincote	—	

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BOGNOR.—For street works in Linden-road and Victoria-drive North, for the Urban District Council. Mr. Oswald H. Bridges, C.E., Bognor:—
W. Port..... £2,474 | Tate, Bros., Bognor* £2094

BOREHAM WOOD (Herts).—For six cottages at Boreham Wood, for Mr. Albert Williams. Mr. Henry James Wise, architect, 7, Great James-street, Bedford-row, W.C.:—
Bracey & Clark (Watford)*..... £1,260

BRISTOL.—For the rebuilding of the Foresters' Arms, for Messrs. Thatcher's Breweries, Ltd. Messrs. C. & C. Thompson, architects, Athenæum-chambers, Bristol. Quantities by Mr. H. J. Pearson, Bristol:—

R. Wilkins & Sons.	£1,429	W. & J. Bennett ..	£1,330
W. Cowlin & Son..	1,419	C. A. Hayes	1,323
E. Love	1,387	F. Chown	1,298
W. Foster	1,375	E. C. Norris*	1,205
A. E. Denby & Co..	1,339		

CAMBOIS.—For erecting Mechanics' Institute Lecture Hall and Caretaker's House, for the Workmen and Inhabitants of Cambois Colliery. Mr. T. Tulip, architect, Whinney Hill, Choppington:—

Barron & Temple....	£1,710 0 0	R. Baxter ..	1,651 0 0
J. W. Redford	1,689 16 6	Cook Bros.*..	1,594 17 0
J. Maughan..	1,662 0 0	Robson & Waddle ..	1,287 0 0
Gordon Bros.	1,654 3 0		

CARDIFF.—For cast-iron girders, etc., required in the construction of a covered service reservoir, Heath extensions, for the Corporation. Mr. C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff:—
Holwell Iron Co., Ltd., Melton Mowbray £622 3 1

CARDIFF.—For cast-iron socket pipes, etc., for the Corporation. Mr. C. H. Priestley. Waterworks Engineer, Town Hall, Cardiff:—
Holwell Iron Co., Ltd., Melton Mowbray £2,135 6 0

CARDIFF.—For the erection of a covered service reservoir to hold 1,700,000 gallons, at the Heath, for the Corporation. Mr. C. H. Priestley, M.Inst.C.E., Town Hall, Cardiff:—

J. & T. Binnes	£13,935 14 8
T. Taylor.....	12,118 11 6
W. Williams	10,704 16 6
A. Fasey & Son.....	9,845 16 1
J. Allan & Son	9,124 10 10
E. Turner & Son	8,323 14 6
C. T. Perkins, Bristol*	8,026 10 0

CARSHALTON.—For erecting a villa at Carshalton, for Mr. J. Garstone, and under the supervision of Mr. A. L. Dartnell, architect, 62, High-street, Croydon:—

W. Martin	£620 0 0	Truett & Steel..	£550 0 0
F. Ludlow	616 0 0	W. Roberts	529 9 0
C. Carpenter....	578 0 0		

CASTLEFORD.—For improvements in Nicholson-street, for the Urban District Council. Mr. W. Green, Surveyor to Council:—
J. L. Rodgers & Sons, Castleford* .. £1,090 4 6

CATERHAM.—For sanitary annexes, Caterham Asylum for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer and Surveyor to the Board. Quantities by Messrs. John Leaming & Sons:—

J. Ferguson & Co.	£4,000 0 0	R. & E. Evans	£2,769 0 0
		W. J. Renshaw	2,749 0 0
Leonard & Mason	3,100 0 0	H. Line	2,696 0 0
		C. Jackson ..	2,689 0 0
Enness Bros.	2,940 0 0	F. J. Webb..	2,663 4 0
R. A. Dean & Co.	2,869 11 9	J. J. Pink ..	2,530 6 3
		T. Cole, 125 & 127, Offord-road, Barnsbury, N.*..	2,328 18 5
Foster Bros.	2,785 0 0		
Gardner & Hazell	2,769 8 7		

[Engineer's estimate, £2,730.]

CATERHAM.—For fire alarms and telephones, Caterham Asylum, for the Metropolitan Asylums Board. Mr. W. T. Hatch Engineer and Surveyor to the Board:—

National Telephone Co., Ltd.	£580 0 0
Sherman, Redfern, & Muston	547 9 0
Jackson Bros.	533 0 0
Willey & Co., Ltd.....	520 0 0
J. Bakewell & Co., Ltd.	493 10 0
W. J. Furse.....	480 0 0
Wright, Methuen, & Co.	462 0 0
Tamplin & Makovski, Ltd.	455 0 0
Private Wire and Telephone Installation Co., Ltd.	401 8 6
J. T. Mayfield & Co.	395 0 0
P. Dewhirst.....	389 0 0
Sax, Julius, & Co., Ltd.....	384 10 0
A. V. Gifkins & Co.	378 0 0
E. T. Mackrill & Sons	375 15 1
E. Newbald & Co.	346 10 4
Baxter & Impey.....	328 10 0
Cox-Walkers	326 0 0
Gent & Hurley, 44, Belvoir-street, Leicester*.....	322 15 0
T. Hodgson & Co.	298 0 0

[Engineer's estimate, £520.]

CHELMSFORD.—For a pair of villas on the London-road. Mr. R. Mawhood, architect, Chelmsford:—

F. Johnson	£1,696	W. Samms	£1,530
Choat & Son	1,680	J. Rayner.....	1,498
Potter & Son.....	1,650	Moss & Co	1,411
J. Gowers	1,637	E. West, Chelmsford*	1,390
F. Weight	1,590		

COGGESHALL.—For alterations and additions to premises, for the Heart-in-Hand Industrial Co-operative Society, Ltd. Mr. J. W. Clark, architect, Coggeshall:—

Potter & Son	£388	E. Sach, Coggeshall*	£245
Jepp	275	Richards & Son	209
Suckling & Co.....	265		

[Architect's estimate, £250.]

DARTFORD (Kent).—For cleaning and painting works at the, Small-pox Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer and Surveyor to the Board:—

J. S. Fenn £379 10		Enness Bros., Erith* £268 0	
Vigor & Co.	310 0		

[Engineer's estimate, £270 10s.]

DEAL.—For rebuilding the Jolly Gardener public house, etc., for Messrs. Thompson & Son, The Brewery, Walmer. Messrs. W. J. Jennings and J. F. Duthoit, architects, 6, Claremont-place, Dover. Quantities by the architects:—

J. E. Turner....	£1,494 9	T. Turner & Co.	£1,415 0
G. B. Cotten....	1,490 0	G. H. Denne & Son.....	1,388 0
W. H. Grigg....	1,480 0		
G. Veeler	1,471 0	J. E. Hayward & Son, Deal*....	1,387 0
T. T. Denne....	1,460 0		
E. Trevers.....	1,423 0		

DEVONPORT.—For Morice Town School improvements, for the Devonport Education Authority. Mr. H. G. Luff, architect, 64A, Chapel-street, Devonport. Quantities by Mr. I. Harvey, Courtenay-street, Plymouth:—

	Contract A.	Contract B.
James Crockerell.....	£1,577 0 0 ..	£312 0 0
T. May	1,535 0 0 ..	298 0 0
Blake.....	1,500 0 0 ..	250 0 0
J. Partridge	1,499 0 0 ..	280 0 0
A. N. Coles	1,496 0 0 ..	318 10 0
A. J. Richards.....	1,461 0 0 ..	268 10 0
Ambrose Andrews	1,440 0 0 ..	293 0 0
S. Roberts.....	1,380 0 0 ..	280 0 0
Jenkins	1,361 0 0 ..	315 0 0
Stanbury	1,342 9 2 ..	265 9 0
A. R. Lethbridge & Son	1,225 0 0 ..	265 0 0
Axworthy	1,189 0 0 ..	365 0 0
J. T. Shepherd.....	1,184 9 5 ..	256 7 7
Pearce Bros.*	1,164 0 0 ..	250 0 0

DORKING.—For the construction of about 5,699 yards of 7in. and 9 in. pipe sewers, with the necessary manholes, lampholes, flushing chambers, etc.; also of sewage-disposal works, pumping station, rising main, roads, etc., at Westcott, in the parish of Dorking Rural, for the Dorking Rural District Council. Mr. W. Rapley, jun., Surveyor, Clovelly, Town-hill, Dorking:—

F. W. Trimm	£9,990 0 0	Streeters & Todhunter	£8,630 0 0
T. Free & Sons	9,648 18 3	E. T. Blomfield	8,417 17 8
G. G. Rayner	9,561 18 0	A. Dixon & Co.	8,350 1 0
H. Roberts ..	9,071 0 0	J. G. Pickard	8,184 13 11
G. S. Falkner	8,985 0 9	J. W. Dean, Ltd., Birkbeck Bank-chambers, Chancery-lane, W.C.*	7,773 0 4
Peerless-Dennis & Co.	8,869 0 0		
Johnson & Langley ..	8,642 7 4		
Davies, Ball, & Co.	8,633 19 9		

GATESHEAD.—For erecting a workshop and warehouse in Sun-street, for Mr. H. Hall. Mr. J. M. Dingle, architect, 3, Ocean-road, South Shields. Quantities by Mr. William Morton, Q.S., Sunderland;—

H. & S. Watson	£1,653 16 8
W. Emmet & Co.....	1,498 10 9
J. McGowan	1,453 2 1
C. T. George.....	1,440 0 0
R. M. Gibson	1,421 13 8
W. Franklin	1,408 8 9
J. Bewley	1,400 0 0
J. Hymers.....	1,386 10 6
J. Milne.....	1,375 0 0
Glen & Moffett.....	1,334 7 8
F. Hutchinson	1,326 5 8
H. & B. Arkless	1,315 1 0
W. C. Tyrie	1,311 11 6
J. McElhatton	1,289 4 10
W. Hall.....	1,288 18 11
R. M. Storey	1,270 7 0
T. & J. White, Newcastle*	1,228 4 3

KIDDERMINSTER.—For cast-iron rising main (water supply works—Contract No. 2), for the Corporation. Messrs. Willcox & Raikes, engineers, 63, Temple-row, Birmingham:—

Biggs, Wall, & Co.....£4,500 16 5		J. W. Dean, Ltd. £3,525 0 0	
C. Jordan & Co.	3,885 0 0	Davis, Ball, & Co., Ltd. ..	3,515 0 0
H. Roberts ..	3,713 0 0	T. Vale & Sons	3,450 0 0
Fitzmaurice & Co.....	3,706 19 0	G. Law	3,123 13 0
C. Chamberlain	3,544 0 0		

KILLUCAN (co. Westmeath).—For additions and improvements to Rahar ey Church, for the Very Rev. M. Dooley. Mr. W. A. Scott, architect, 72, Hollybank-road, Drumcondra, Dublin:—

T. O'Reilly	£949 10 0
P. Hanway, Dublin*	896 0 0

KINGSTON-ON-THAMES.—For alterations to engine-room and coal store, building small office and foundations for new machines, etc., at the workhouse infirmary, for the Guardians. Mr. W. H. Hope, architect, Seymour-road, Hampton Wick. Quantities by the architect:—

W. R. Lane & Son	£2,327 0	A. F. Mitchell ..	£2,103 9
McDonald Bros. .	2,299 0	C. E. Oldridge & Sons, London-road, Kingston-on-Thames* ..	2,074 10
Mallett & Wood .	2,253 0		
W. J. Coleman & Co.	2,170 0		

LONDON SCHOOL BOARD TENDERS.

Hearnville-road Site, Balham, for New School.

Accommodation: Boys, 331; girls, 331; infants, 340; total, 1,002. (School planned for future extension.) Boys' and girls' graded school (two stories)—Halls: Boys, 50 ft. by 26 ft. Girls, 50 ft. by 26 ft. Classrooms: Boys, 56, 50, 45, 45, 45, 45, 45; girls, 56, 50, 45, 45, 45, 45, 45. Infants' school (one story)—Hall, 54 ft. by 26 ft. 6 in. Classrooms, 50, 50, 48, 48, 48, 48. Heating by low-pressure hot-water apparatus and open fires. Area of site, 49,500 square feet. Playgrounds (area per child)—Boys, about 30 square feet; girls and infants, about 26 square feet:—

Holloway Bros., Ltd.	£18,829	Leslie & Co., Ltd.	£18,106
		E. Triggs	18,092
Martin, Wells, & Co., Ltd.	18,807	W. Downs	17,999
		J. Garrett & Son	17,862
C. F. Kearley	18,688	Stimpson & Co. ..	17,800
W. King & Son ..	18,481	F. & H. F. Higgs	17,598
Holliday & Greenwood, Ltd.,....	18,154	J. Carmichael	17,567
		W. Johnson & Co., Ltd.*	17,146
Lathey Bros.	18,141		

Deansfield-road Site, Eltham, for New School.

Senior mixed school, 420; junior mixed school, 392; infants' school, 390; total, 1,202. Senior mixed school of one story: Hall, 58 ft. 3 in. by 28 ft. 9 in.; class-rooms, 50, 50, 48, 48, 40, 40, 40, 32, 32. Heating by low-pressure hot-water apparatus. Junior mixed school of one story: Hall, 56 ft. by 28 ft.; classrooms, 56, 56, 48, 48, 48, 48, 40. Heating by low-pressure hot-water apparatus. Infants' school of one story: Hall, 54 ft. by 26 ft. 6 in.; classrooms, 50, 50, 50, 48, 48, 48, 48. Heating by low-pressure hot-water apparatus and open fires. Area of site, 87,120 square ft. Playgrounds, area per child: Senior and junior boys', 39 square feet; girls' and infants', 35 square feet. (An existing house on site will be retained for the use of the schoolkeeper.):—

W. Johnson & Co., Ltd.	£24,862	E. Lawrence & Sons	£22,692
J. Greenwood, Ltd.	23,441	F. & H. F. Higgs	22,581
J. Smith & Sons, Ltd.	23,296	Treasure & Son ..	22,561
		Lathey Bros.	22,475
Martin, Wells, & Co., Ltd.	23,250	Holliday & Greenwood, Ltd.	22,397
G. E. Wallis & Sons	22,862	J. Garrett & Son	22,389
		Perry & Co.....	22,378
Patman & Fotheringham, Ltd. ..	22,750	W. Downs	22,373
		J. & C. Bowyer*..	21,953

Magdalen-street Temporary School, Horselydown: New School to take the place of existing School.

Accommodation: Junior mixed and infants', total 372. Hall, 51 ft. by 26 ft. Classrooms: 50, 50, 48, 48, 48, 40, 40. Heating by low-pressure hot-water apparatus and open fires. Area of site, 15,200 sq. ft. Playgrounds: Area per child—Junior girls' and infants', 14 sq. ft.; junior boys', 17 sq. ft. (An existing house will be retained for the accommodation of the schoolkeeper.)

Martin, Wells & Co., Ltd.	£9,850	Staines & Son	£8,978
		J. Marsland & Sons	8,855
F. & H. F. Higgs..	9,548	J. Greenwood, Ltd.	8,772
Rice & Son	9,442	Stimpson & Co.....	8,660
W. Downs.....	9,380	J. Garrett & Son ..	8,601
T. L. Green	9,269	T. D. Leng	8,569
General Builders Ltd.	9,113	E. Triggs	8,541
		Spencer, Santo, & Co., Ltd.....	7,947
Lathey Bros.....	9,027		
W. King & Son ..	8,989	Edwards & Medway*	7,400

New End Site, Hampstead, for New School.

Accommodation: Junior mixed, 194; senior mixed, 198; infants, 220; total, 612 (planned for future extension). Three story building with science and art rooms and playground over. School partly built on arches, thus forming covered playground for boys and heating chamber. Junior mixed school: Hall, 40 ft. by 21 ft. 6 in.; classrooms, 56, 50, 48, 40. Senior mixed school: Hall, 40 ft. by 21 ft. 6 in.; classrooms 48, 40, 40, 40, 30. Infants' school: Hall, 39 ft. 3 in. by 21 ft.; classrooms, 60, 56, 56, 48; drawing classroom, 600 ft. area; science room, 600 ft. area. Heating by low-pressure hot-water apparatus and open fires. Also schoolkeeper's house. Area of site, 25,120 sq. ft. Playgrounds, area per child: Boys', senior and junior mixed, about 34 sq. ft.; girls', senior and junior mixed, and infants', about 26 sq. ft.

McCormick & Sons	£22,877	T. L. Green.....	£20,766
G. S. S. Williams & Son	22,745	Stimpson & Co...	20,750
		C. Miskin & Sons..	20,576
L. H. & R. Roberts	21,892	C. Dearing & Sons	20,334
Patman & Fotheringham, Ltd. ..	21,447	Treasure & Son ..	20,329
		E. Lawrance & Sons*	19,708
F. Gough & Co...	21,387		
J. Simpson & Son	21,000		

New King's-road School, Chelsea: Arrangements for Completion of School.

The Board are now erecting a school on the New King's-road site to provide accommodation for 892 children, the contract date for completion being January, 1905. The school is planned for enlargement by two additional class-rooms on each floor, thus increasing the total accommodation of the school to 1,148 places. The Board of Education have now approved the proposal of the Board to complete the school at once, according to the plans submitted, and the Works Committee recommend that the provision of these additional class-rooms (which will accommodate 256 children) be placed in the hands of Messrs. J. & M. Patrick, the contractors for the new school, as a variation on their contract.

High-street School, Stoke Newington, for Halls and other Improvements.

Boys' department—Providing new hall about 37 ft. by 24 ft. 6 in.; altering and re-arranging existing staircase; providing new class-room for 40; re-dividing, re-stepping and re-lighting existing classrooms and providing new lavatory. Girls' department—Providing new hall about 37 ft. by 24 ft. 6 in.; removing existing staircase and providing a new one; providing new Teachers' room and water closet; enlarging existing Teachers' room and converting it into classroom for 40; re-dividing, re-stepping and re-lighting existing class-rooms; providing new cloakroom and lavatory. Infants' department—Providing new hall about 37 ft. by 24 ft. 6 in.; enlarging existing Babies' room, re-stepping and converting into classroom for 32; removing stepping from existing room and converting it into a Babies' room for 44; re-dividing, re-stepping and re-lighting existing classrooms. Revised accommodation: Boys, 236; Girls, 213; Infants, 234; total, 683; net loss of 62 places:—

J. Grover & Son ..	£6,608	L. H. & R. Roberts	£5,842
F. & F. J. Wood ..	6,255	Clarke & Bracey ..	5,769
W. Shurmur & Sons, Ltd.....	6,225	E. Lawrance & Sons	5,744
		Perry & Co.	5,639
W. Gregar & Son..	6,171	A. Porter	5,595
G. S. S. Williams & Son	6,159	C. Dearing & Son..	5,574
		Treasure & Son....	5,419
A. E. Symes	6,069	J. Willmott & Sons	5,270
W. M. Dabbs & Son	5,972	J. Chessum & Son*	5,133
McCormick & Sons.	5,925		

Millfields-road School, Clapton, for Additional Heating.

W. G. Cannon & Sons £286	0	Brightside Foundry & Engineering Co., Ltd. £241	0
J. & F. May	266 0	R. Clarke	241 0
Purcell & Nobbs..	258 0	J. Defries & Sons, Ltd.	225 12
B. Harlow & Son .	257 0	Bates & Sons	206 10
J. Wontner-Smith, Gray, & Co. ..	254 0	Palowkar & Sons*.	193 7
Stevens & Sons ..	253 0		

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For Repairs to Heating Apparatus.

——	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 11	Group 12
*Brightside Foundry and Engineering Co., Ltd.	15	15	10	17½	10	17½	12½	7½	7½	7½	10	17½
*Wontner-Smith, Gray & Co.	17½	12½	12½	12½	12½	17½	17½	17½	17½	17½	22½	22½

Mantle-road Site, Brockley: Erection of Junior Mixed School.

Accommodation, 404; hall, 61 ft. 6 in. by 26 ft. 6 in. Class-rooms—Ground floor: 56, 50, 48, 48. First floor: 56, 50, 48, 48, with playground on top of building for junior boys. Heating by low-pressure hot-water apparatus. Playgrounds, area per child: Junior boys, about 16 square feet; junior girls, about 25 square feet:—

T. D. Leng	£11,474	W. Johnson & Co., Ltd.	£10,777
Martin, Wells, & Co., Ltd.	11,248	Lathey Bros.	10,640
Enness Bros.	11,209	W. Downs	10,393
J. Smith & Sons, Ltd.	11,084	J. & M. Patrick	10,314
F. & H. F. Higgs	10,889	Treasure & Son	10,307
E. Lawrance & Sons	10,857	J. & C. Bowyer	10,197
W. J. Mitchell & Son	10,798	G. E. Wallis & Sons	10,177
		J. Garrett & Son*	10,143

Painting the Interior and Exterior of the Albion Hall and Swimming Bath.

C. Willmott & Son	£400 0	A. J. Sheffield	£339 0
J. Dolman & Co.	385 0	W. Silk & Son	302 0
Barrett & Power	365 0	Woollaston Bros.*	258 10
G. Barker	359 0		

STRUCTURAL ALTERATIONS AT VARIOUS SCHOOLS.

(a) Finsbury—Princeton-street—

McCormick & Sons	£237	General Builders, Ltd.	£177
M. Pearson	228	Lathey Bros.	167
H. Bouneau	218	T. L. Green	157
J. Stewart	207	Thompson & Beveridge*	148

(b) West Lambeth—Gideon-road—

J. & M. Patrick	£322	W. J. Coleman & Co.	£250
Maxwell Bros., Ltd.	297	Rice & Son	243
W. Hammond	295	J. Garrett & Son	233
Lathey Bros.	283	E. B. Tucker	229
E. Triggs	278	Galbraith Bros.*	220

(c) West Lambeth—Stockwell-road—

W. Hammond	£131	J. C. Chalkley	£95
Maxwell Bros., Ltd.	130	E. B. Tucker	85
Rice & Son	127	J. Garrett & Son	80
E. S. Ronald	117	Whitehead & Co., Ltd.*	75

(d) Marylebone—Rhyl-street—

McCormick & Sons	£490	London School Furniture Co.	£437 4
C. Dearing & Son	460	S. Polden	390 10
Thompson & Beveridge	459	Marchant & Hirst	390 0
Stevens Bros.	450	F. T. Chinchen & Co.	347 10
General Builders, Ltd.	449	Philip King & Co.*	345
G. S. S. Williams & Son	447		

Gainsborough-road School, Hackney Wick, for Providing Ventilating Skylights, etc., in Girls' Department.

A. E. Symes	£415 0	J. Stewart	£314 0
C. Dearing & Sons	340 0	Barrett & Power*	274 2
A. Porter	327 0	J. Willmott & Sons	217 0

"Catherine House," No. 31, Blackheath-road, for Adaptation of Premises for Temporary Special School.

First list of tenders (without quantities):—

G. Kemp	£790	E. Proctor & Son	£683
Thomas & Edge	689	J. & C. Bowyer	645
H. Groves	675	H. Leney & Son	600

As the amount of the lowest tender was in excess of the architect's estimate, the committee were of opinion that fresh tenders should be obtained, and that quantities should be supplied. These tenders have now been received, the amounts of which are as follow. Second list of tenders (with quantities):—

J. C. Chalkley	£854 0	J. & C. Bowyer	£693 0
H. J. Williams	820 3	W. Sayer & Son	675 0
G. Kemp	790 0	E. Proctor & Son	654 0
W. J. Howie	770 0	H. Leney & Son	620 0
Maxwell Bros., Ltd.	720 0	H. Line	589 0
Thomas D. Leng	717 0	H. Groves*	585 0

Buck's-row School, Whitechapel, for Constructing Room for Teachers.

Barrett & Power	£247 10	Woollaston Bros.	£187 10
G. Barker	247 0	J. T. Robey	175 0
A. E. Symes	238 0	A. J. Sheffield*	149 0
Vigor & Co.	189 0		

Montem-street School, Tollington Park, for Enlargement of Boys' Higher Elementary School and provision of Science Room, etc.

Boys' Higher Elementary School — Class-room for 40; Metalwork-room, 795 ft. area; and Physical Laboratory, 832 ft. area. General Science room for Senior Girls, 607 ft. area:—

J. Grover & Son	£4,117	Clarke & Bracey	£3,403
L. H. & R. Roberts	3,914	C. Dearing & Son	3,370
G. S. S. Williams & Son	3,799	Stevens Bros.	3,364
J. Willmott	3,678	Perry & Co.	3,333
F. & F. J. Wood	3,481	E. Laurance & Sons	3,287
McCormick & Sons.	3,442	Treasure & Sons*	3,092

Holmes-road School, Kentish Town, for Laundry Centre.

The plans of the proposed Laundry Centre also include draining and tar-paving additional land and providing a coal store:—

McCormick & Sons.	£1,189	Stevens Bros.	£1,114
T. L. Green	1,176	Marchant & Hirst	1,085
General Builders, Ltd	1,159	J. Willmott & Sons	1,074
F. Newton	1,157	Treasure & Son	1,035
G. S. S. Williams & Son	1,128	E. Lawrance & Sons*	1,027

Middle-row Site, Kensal New Town—Arrangements for the erection of a Manual Training Centre.

The Board of Education, on the 5th March, sanctioned the proposed erection of a Manual Training Centre to accommodate 40 boys on the Middle-row Site, Kensal New Town, to take the place of the present unsatisfactory Centre at Wornington-road School. The Works Committee are of opinion that as Mr. E. Triggs is now engaged in completing the erection of the Junior Mixed department on this Site, opportunity should be taken while he is still on the Site to provide the Manual Centre (the cost of which work is estimated at £947), as a variation on his contract for the Junior Mixed School.

Ensham-street Site, Mitcham-road, Lower Tooting—Arrangements for enlargement of Manual Training Centre.

In connection with the new school recently opened on the Site in Ensham-street, Mitcham-road, Lower Tooting, the Board have erected a Manual Training Centre, which has been planned for extension to accommodate 20 additional boys. The Board of Education, on the 5th March, sanctioned the proposal to enlarge this Centre, and the Committee are of opinion, under the circumstances, that this work (the cost of which is estimated at £475) should be carried out by the Contractors for the new school as a variation on their contract.

St. Paul's-road School, Bow Common—For Drainage and Sanitary Works.

E. Lawrance & Sons	£3,611 0 0	J. Willmott & Sons	£3,305 0 0
A. E. Symes	3,471 0 0	F. & F. J. Wood	3,277 11 6
G. S. S. Williams & Son	3,466 0 0	Lathey Bros.	3,197 0 0
J. Peattie	3,354 0 0	Stevens Bros.	3,156 0 0
R. P. Beattie	3,323 0 0	F. Bull*	3,098 0 0
		A. Porter	2,955 0 0

Mowlem-street School, Cambridge Heath, for Sanitary and Drainage Works.

Ashby Bros.	£3,423 0	Stevens Bros.	£2,896 0
A. E. Symes	3,286 0	L. H. & R. Roberts	2,885 0
E. Lawrance & Sons	3,258 0	Ashby & Horner.	2,871 0
G. S. S. Williams & Son	3,144 0	F. Bull	2,856 0
F. & F. J. Wood	2,997 0	R. P. Beattie	2,807 18
J. Willmott & Sons	2,916 0	J. Peattie	2,774 0
		A. Porter*	2,570 0

For supply of Map and Diagram Tables.

	Each.		Each.
S. J. Waring & Son, Ltd.	£8 5 0	H. Bouneau	£6 12 6
T. Cruwys	7 10 0	London School Furniture Co.*	6 5 0
T. Wallis & Co., Ltd.	6 19 6	A. Duncan	5 15 0
G. M. Hammer & Co., Ltd.	6 14 0	R. Goodman & Sons	2 15 0
		Previous Prices	5 7 6

Running Contracts for the Supply of Various Articles of Furniture, etc.

——	Carpenters' Benches.	Carpenters' Stools.	Forms (for Special Schools).	"T" Slides (for old easels).
	£ s. d.	s. d.	£ s. d.	s. d.
H. Bouneau ..... each	*2 2 0	*8 6	—	1 4
W. Brake & Co. ..... "	2 15 6	9 6	1 5 0	—
T. Cruwys ..... "	—	—	1 2 0	4 0
Educational Supply Association, Ltd. ..... "	3 13 6	10 0	0 13 6	1 4
Galbraith Bros. ..... "	2 5 0	4 9	—	2 0
J. Garvie & Sons ..... "	2 5 0	8 9	—	—
General Builders, Ltd. ..... "	4 7 6	17 6	—	—
Goodall, Lamb, & Heighway, Ltd. ..... "	3 18 6	14 0	—	3 6
R. Goodman & Sons ..... "	—	—	*0 7 9	—
G. M. Hammer & Co., Ltd. ..... "	2 8 0	7 9	0 8 0	1 2
W. H. Lascelles & Co. ..... "	2 19 6	8 6	—	—
London School Furniture Co. ..... "	—	—	0 8 0	*1 1
Marchant & Hirst ..... "	5 0 0	10 6	—	—
North of England School Furnishing Co., Ltd. "	—	—	—	2 0
T. R. Roberts, Ltd. ..... "	—	—	—	1 11½
E. Spencer & Co. ..... "	2 5 0	9 6	—	—
S. J. Waring & Sons, Ltd. ..... "	—	—	0 18 9	3 4
Wrinch & Sons ..... "	—	—	0 9 3	—
Previous prices ..... "	2 2 6	5 9	0 9 0	1 3

William-street School, Hammersmith-road—For Improvements in Boys' and Girls' departments.

Boys' department—Providing hall, about 37ft. by 32ft.; staircase; re-dividing, re-stepping, and re-lighting classrooms; providing lavatory and cloakroom. Girls' department—Providing Hall, about 37ft. by 32ft.; re-dividing, re-stepping and re-lighting classrooms; providing teachers' rooms, cloakroom, lavatory and stock-room; removing Housewifery Centre.

Chas. Wall, Ltd.	£5,415	Martin, Wells & Co., Ltd.	£5,005
G. Neal	5,404	General Builders, Ltd	4,989
C. F. Kearley	5,327	J. Grover & Son	4,851
Rice & Son	5,250	Treasure & Son	4,850
J. Simpson & Son	5,094	Stimpson & Co.	4,770
Lathey Bros.	5,079	Leslie & Co., Ltd.	4,704
E. Triggs	5,041	F. G. Minter*	4,437

Clifton-road School, New Cross, for Rebuilding Offices, etc.

Rebuilding boys' offices and urinal, laying new surface water drains in boys' playground; repairing defective soil pipes; trapping boys' and girls' lavatories, also teachers' lavatories; and carrying out other minor sanitary alterations.

Maxwell Bros., Ltd.	£760 0	J. W. Falkner & Sons	£693 0
J. & C. Bowyer	755 0	W. J. Mitchell & Son*	649 0
R. P. Beattie	746 2		
G. Parker	743 0		

New King's-road School, Fulham, for Heating Apparatus.

W. G. Cannon & Sons.	£889	J. C. Christie	£725
G. Davis	820	C. Kite & Co.	725
J. & F. May	800	Brightside Foundry & Engineering Co., Ltd.	703
J. Sloper & Co.	800	J. Wontner-Smith, Gray, & Co.	693
Werner, Pfleiderer, & Perkins, Ltd.	773	B. Harlow & Son	659
J. Williams & Sons, Ltd.	770	Wippell Bros., & Row*	650
Strode & Co.	743		

LONDON. — For cleaning and painting works, Fountain Hospital, for the Metropolitan Asylums Board. Mr. T. W. Hatch, Engineer and Surveyor to the Board:—

H. J. Butcher	£3,240	J. J. Richards	£1,160
J. S. Fenn	2 199	W. J. Coleman & Co.	1,120
F. Green & Sons	1,850	E. Proctor & Son, 328, High-street, Plumstead*	1,004
R. Athey	1,744	P. McCarthy	739
Leonard & Mason	1,725	Excelsior House Painting Co.	385
T. Carr	1,650		
W. A. King	1,302		
Higgs & Hill, Ltd.	1,284		
R. Woollaston & Co.	1,250		
Vigor & Co.	1,240		

[Estimated cost of works, £1,587.]

LONDON.—For Engineers' Tools and Workshop Appliances, etc., Joyce-green Hospital, for the Metropolitan Asylums Board:—

Jukes, Coulson, Stokes & Co.	£173 19 3
Easterbrook, Allcard & Co., Ltd., Albert Works, Penistone-road, Sheffield*	175 2 1
W. Newbold & Co.	184 17 3
Loudon Bros.	188 11 5
J. Nicholson	210 18 2
Moorwood, Sons & Co.	214 6 6
Pryke & Palmer	218 11 10
Smith Bros.	235 10 0

[Engineer's estimate, £185.]

LONDON.—For cleaning and painting works, North-Western Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer and Surveyor to the Board:—

J. S. Fenn	£899	Vigor & Co.	£490
F. Green & Sons	850	E. Proctor & Son	380
T. Webster	780	R. Woollaston & Co.	325
Drake & Son	723	Higgs & Hill, Ltd., Crown Works, South Lambeth*	298
H. Robinson	647	P. McCarthy	261
W. Reason	639		
Bate Bros.	572		
T. Carr	550		

[Engineer's estimate, £344.]

MALLOW (Ireland).—For erecting sixteen artisans' dwellings, for the Urban District Council. Mr. B. E. F. Sheehy, architect, 57, George-street, Limerick:—

T. Gallivan, Killarney £2,416

MIDHURST (Sussex).—For about five and a half miles of stoneware and iron sewers, etc., for the Rural District Council. Messrs. John Taylor, Sons, and Santo Crimp, engineers, 27, Great George-street, Westminster:—

		Time, Months.
A. E. Nunn	£24,117	10
R. H. B. Neal	22,260	10
E. Iles	22,000	12
Higlett & Hammond	21,483	11
G. Bell	19,381	12
Johnson & Langley	19,286	10
B. Cook & Co.	18,452	9
B. Firth & Co.	18,206	12
Streeter & Todhunter	17,658	—
B. W. Primm	17,616	10
J. W. Dean, Ltd.	17,145	8
H. Roberts	16,832	12
J. Moran & Son, Main-road, Dovercourt, Harwich	16,788	8½

‡ Recommended for acceptance.

MORECAMBE.—For the construction of a combined shelter and conveniences on the promenade at Bare, for the Corporation. Mr. J. Bond, Borough Surveyor, Municipal Offices, Morecambe-street:—

J. Parkinson, Contractor, Morecambe* .. £608

NUNEATON.—For the construction of earthenware pipe sewers and surface-water drains in Arbury-road, for the Nuneaton and Chilvers Coton Urban District Council. Mr. F. C. Cook, Engineer, Council Offices, Nuneaton:—

Moss & Son	£2,196 6 6	T. Smith, Nuneaton*	£1,748 5 11
T. Philbrick	2,123 1 2	J. Holme	1,682 13 0
Wilson Bros.	1,823 7 5		
J. & T. Burgoyne	1,811 6 3		

TENDERS—*Continued on page 351*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums	Designs to be Delivered
*Public Library	Borough of Stamford	25*l.*, 15*l.*, and 10*l.	May 31

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
600 yds. of Galvanised Iron Fencing, Cricket Ground	Weston-super-Mare Cricket Grd. Co.	D. Beak, 2, Arundel-villas, Weston-super-Mare	Mar. 26
Road Material	Wath-upon-Dearne U.D.C.	H. C. Poole, Surveyor, Town Hall, Wath-upon-Dearne	do.
Cast-iron Pipes and Castings (Waterworks Extensions)	East Grinstead R.D.C.	Downes & Cornewall-Walker, Engineers, 45, Warwick-road, Redhill	Mar. 28
Laying and Jointing Water Mains, etc.	do.	do.	do.
Granite Setts	East Ham U.D.C.	A. H. Campbell, Borough Engineer, Town Hall, East Ham	do.
Fourteen Workmen's Dwellings, Upper St. John-st.	Lichfield Sanitary Committee	Emerson Brooke, City Surveyor, Lichfield	do.
Filter Beds and Drains at Sewage Farms, Curborough	do.	do.	do.
Electric Distribution, Dalmuir	Glasgow Corporation	Office of Public Works, City-chambers, 64, Cochrane-st., Glasgow	do.
Roadmaking, etc., South-street	Dorking U.D.C.	G. Somers Mathews, Town Surveyor, Dorking	do.
Decorating, etc., Route of Royal Procession	Decorations Committee, Bradford	F. Stevens, Town Clerk, Town Hall, Bradford	do.
Decorating Interior of St. George's Hall	do.	do.	do.
Materials	Cheadle and Gatley U.D.C.	E. Sykes, C.E., Council Offices, 9, High-street, Cheadle, Manchester	do.
Fire Station at Town's Yard, Cheadle	do.	do.	do.
Materials, etc.	Tonbridge R.D.C.	F. Harris, Engineer, Broadway, Southborough, Tunbridge Wells	do.
Granite	Lampeter Borough Council	D. Thomas, Surveyor, Lampeter, Cardiganshire	do.
Conver. Two Thro' Arches, Gen. Sett'gs to Regen'tors	Cleckheaton U.D.C.	Gas Engineer, Town Hall, Cleckheaton	do.
Widening Flotterstone Bridge (Talla Scheme, Con. 34)	Edinburgh, etc., Water Trustees	W. A. Tait, C.E., 72A, George-street, Edinburgh	do.
Stores	Ashton-under-Lyne Corporation	General Offices, Mossley-road, Ashton-under-Lyne	do.
Flags, Setts, and other materials	do.	Borough Surveyor, Town Hall, Ashton-under-Lyne	do.
Maintenance of Roads	Wigton R.D.C.	W. Brown, Surveyor, Kildare, Wigton	do.
Vestry, etc., Parish Church, Tarves, Scotland	Kirk Session	J. Cobban, Architect, Haddo House, Tarves	do.
Altera., etc., Church Lands Farm, Ottringham, Hull	.....	Freeman, Son, & Gaskell, Arch., Albert-cham., 11, Carr-la., Hull	do.
Shop and Residence, Kilmurry South, Ireland	Mrs. Murphy	A. W. Barnard, Architect, Macroon	do.
Sanitary Work at Town Hall	Maidenhead Town Council	P. Johns, Borough Surveyor, Guildhall, Maidenhead	do.
Paving, etc., Mumbles, near Swansea	Oystermouth U.D.C.	J. H. Robinson, Clerk, Council Offices, Mumbles	do.
Portland Cement	Derwent Valley Water Board	E. Sandeman, Engineer, Bamford, via Sheffield	Mar. 29
Street Works, North Shields and High Chirton	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, Tynemouth	do.
Drain Pipes, Cement, etc.	do.	do.	do.
Laying Cement Concrete Footpaths	do.	do.	do.
12 Dw'ling H'ses & Conveniences, Laird-rd., Wadsley	Anc. Order of Foresters Inves. Assoc	G. Abbott, Secretary, 222, Solly-street, Sheffield	do.
Sewering, Paving, etc., of Eight Streets, Broughton	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	do.
Temperance Hall, etc., Longford	.....	Hague & M'Namara, Architects, 50, Dawson-street, Dublin	do.
Twenty-seven Sets of Main Line Points & Crossings	Glasgow Corporation Gas Dept.	A. Wilson, Engineer, 45, John-street, Glasgow	do.
Water Supply Scheme, Nevin	Lleyn R.D.C.	Minyffynnon, Well-street, Nevin, Wales	do.
*New Coastguard Detachment, near Pembroke	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.	do.
*Disinfector-ft Drying Rms., etc., St. John's-rd. W'h'se	St. Mary, Islington, Guardians	Master of the Workhouse, St. John's-road, Upper Holloway	do.
Surface Water Sewers	Ealing Town Council	C. Jones, M.Inst.C.E., Town Hall, Ealing, W.	Mar. 30
Conversion of Premises in Wade-st. to a Public House	.....	Jackson & Fox, Architects, 7, Rawson-street, Halifax	do.
Granite Setts	Keighley Corporation	W. H. Hopkinson, Borough Engineer, Town Hall, Keighley	do.
Two Sanitary Tumbler Carts	East Stonehouse U.D.C.	F. A. Wiblin, Surveyor, Town Hall, East Stonehouse, Devon	do.
Setts, etc.	Rochdale Paving, etc., Committee	Borough Surveyor's Office, Town Hall, Rochdale	do.
Erection Butcher's Shop, etc., Terrington St. Clement	.....	R. W. Bryant, Terrington St. Clement	do.
Making-up Napier-road, Avonmouth	Barton Regis R.D.C.	H. T. K. Lancaster, Cl'k, Council Offs., S'thend, W'tbury-on-Trym	do.
Free Library and Public Hall, Felinfoel, Wales	.....	W. Griffiths, Architect, Llanelly	do.
Extension to Llanelly Hospital	The Committee	do.	do.
Pair of Semi-detached Villas, Haxby, Yorks.	.....	A. H. Everest, Architect, 8, New-street, York	do.
Wooden Bothies at Hillend	Edinburgh & Dist. Water Trustees	J. Jerdan, Architect, 12, Castle-street, Edinburgh	do.
*Making-up Passage at Rear of Uxbridge-road	Borough of Ealing	Borough Engineer, Town Hall, Ealing, W.	do.
*Three Temporary Schools	K'gs Norton, etc., U.D.C. Edu. Com.	Sur. to the Council, 23, Valentine-rd., King's-heath, nr. Birmingham	do.
Two Houses, Stump Cross, Halifax	.....	A. G. Dalzell, Architect, 15, Commercial-street, Halifax	Mar. 31
Supplies	Warrington Gas Committee	W. S. Haddock, Gas Office, Mersey-street, Warrington	do.
Making-up Streets	Slough U.D.C.	Surveyor to Council, 1, Mackenzie-street Slough	do.
Conver. with Exten. of Premises, Cardiff-rd., Bargoed	Dr. E. R. Bowen	P. Vivian Jones, Architect and Surveyor, Hengoed	do.
42 Tons of 3 in. c.i. Pipes, etc.	Walton-le-Dale, U.D.C.	F. E. Dixon, C.E., 49, Lune-street, Preston	do.
Laying and Fixing Pipes, Penwortham Mill, Main	do.	do.	do.
2,080 super. Yards of Tar Macadam, Wortley Park	Leeds City Council	City Engineer's Office, Municipal-buildings, Leeds	do.
*Conversion of Eight Private Houses into Shops	Empire Freeh'd Developm't Co. Ltd.	Empire Freehold Developm't Co., Ltd., 586, High-rd., Chiswick, W.	do.
Road-making at Hemsworth	Hemsworth R.D.C.	T. H. Richardson, Hemsworth, near Wakefield	April 1
Six Bogie Cars & One Electrically-Driven Water Cart	Reading Corporation	W. Binns, Tramways Office, Mill-lane, Reading	April 2
Two Through Houses, Cheapside, Greetland	.....	Rose and Crown Inn, Greetland, Yorkshire	do.
Sewerage and Sewage Disposal	Toybridge U.D.C.	Cameron, Commin, & Martin, 1, Victoria-street, Westminster, S.W.	do.
Bluestone and Slag	Pocklington R.D.C.	T. Robson, Clerk, Pocklington	do.
Road Metal, Tools, etc.	Staffordshire County Council	J. Moncur, Chief Surveyor of Roads, County-buildings, Stafford	do.
Drain, M'Donald-road Electric Lighting Station	Edinburgh Town Council	R. Morham, City Arch., Pub. W'ks. Office, City-cham., Edinburgh	do.
Red House, Cwmavon-road, Aberavon	E. Evans Bevan	J. Cook Rees, Architect, Neath	do.
Public Library at Skewen	Coedfrane Parish Council	do.	do.
Road Materials	Uttoxeter R.D.C.	J. Preston, Surveyor, Woodlands, Uttoxeter	April 4
Electricity Meters	Edinburgh Corporation	Resident Electrical Engineer, 5, Dewar-place, Edinburgh	do.
Drapery Warehouse, Elgin	Messrs. T. Baxter & Co.	R. B. Pratt, Town and County Bank-buildings, Elgin	do.
Painting and Repairs at Castle Pleasure Grounds	Guildford Town Council	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford	do.
Stores	Lancashire and Yorkshire Railway	Mr. Duffin, Stores Department, Osborne-street, Manchester	do.
Extension of Main Sewer, Furlong-road	Bolton-upon-Dearne U.D.C.	Surveyor to Council, Bolton-upon-Dearne, Rotherham	do.
Storage Reserv'r, etc., Noddsdale Water, Outerwards	Largs Town Council	W. R. Copland, C.E., 146, West Regent-street, Glasgow	do.
Sewerage Works, Auchinblae	Laurence Kirk Com., Kincardinesh'e	Jenkins & Marr, Engineers, 16, Bridge-street, Aberdeen	do.
Dredging, etc., Seven Miles of River Perry, nr. Ruyton	Drainage Commissioners	M. B. Lawford, Clerk to Commissioners, Upper Brook-st., Oswestry	April 5
Alexandra-road Works	Withington U.D.C.	A. H. Mountain, Surveyor to Council, Town Hall West Didsbury.	do.
Electric Bed Lift for New Pavilion at Withington	Chorlton Guardians	J. B. Broadbent, A.R.I.B.A., 15, Cooper-street, Manchester	do.
Road Materials	Epsom R.D.C.	T. E. Ware, Surveyor, Waterloo-road, Epsom	do.
100 Fathoms Best Swedish Board Ends	Kingston-on-Thames Guardians	J. Edgell, Clerk, Union Offices, Coombe-road, Kingston	do.
Street Works, Mansfield	.....	R. F. Vallance, Borough Surveyor, Mansfield	do.
Stoneware Sewer	Braintree U.D.C.	H. H. Nankivell, Surveyor, Vestry Hall, Braintree	do.
*Making-up Roads	Beckenham U.D.C.	Council's Surveyor, Beckenham	do.
Works and Materials	Sunderland Corporation	Borough Engineer, Town Hall, Fawcett-street, Sunderland	April 6
Extensions of Kinglassie Cemetery	Kinglassie Parish Council	W. Birrell, Architect, 200, High-street, Kirkcaldy	do.
Granite	Woodhall Spa U.D.C.	J. E. Chatterton, Clerk, Church-lane, Horncastle	do.
Road Metal	Whickham U.D.C.	T. Lambert, Clerk, Town Hall, Gateshead	do.
Church Village Sewage, Llantwit Fardre	Llantrisant, etc., R.D.C.	G. S. Morgan, Engineer, School-street, Pontyclun	do.
Annual Contracts	Leeds Tramways Committee	J. B. Hamilton, Tramways Office, City-square, Leeds	do.
Paving and Flagging Streets	Leeds City Council	City Engineer's Office, Municipal Buildings, Leeds	do.
Bridge, Pontyglazier	St. Dogmell's R.D.C.	A. H. Thomas, A.R.I.B.A., Co. Surveyor's Office, Haverfordwest	do.
*Wiring & Fittings for Elec. Lighting, Napsbury Asy.	County Council of Middlesex	W. H. Massey, 25, Queen Anne's-gate, Westminster, S.W.	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Synchronous Motor Generators at Sub-stations	Manchester Electricity Committee..	F. E. Hughes, Sec. of Electricity Dept., Town Hall, Manchester..	April 7
Flue-fired Superheaters at Dickin-street Station	do.	do.	do.
Building St. Jude's Church, Swansea.....	Hon. and Rev. W. Talbot-Rice....	E. M. Bruce Vaughan, F.R.I.B.A., Boro'-cham.,St. Mary-st., Cardiff	do.
Road Materials	Lanchester R.D.C.	W. Cumming, Highway Surveyor's Office, Lanchester	do.
*Electricity Generating Station.....	Stepney Borough Council	Borough Engineer, 15, Great Alie-street, Whitechapel, E.	do.
*New Church and Schools, Old Shoreham-road, Hove	.....	E. J. Hamilton, 2, New-road, Brighton.....	do.
*Nurses Home in Fulham Palace-road.....	Parish of Fulham.....	A. Saxon Snell, 22, Southampton-buildings, Chancery-lane, W.C.	do.
Crematorium, City-road Cemetery	Sheffield City Council	C. Hadfield, Architect, Cairns-chambers, St. James's-st., Sheffield.	April 8
Depot, including Fire Station & Mortuary, Selly Oak	King's Norton and Northfield U.D.C.	A. W. Cross, A.M.Inst.C.E., 23, Valentine-road, King's Heath ..	do.
Cefn Cemetery Extension Works (Contract 2)	Merthyr Tydfil U.D.C.....	T. F. Harvey, C.E., Town Hall, Merthyr Tydfil	do.
Materials	Midsomer Norton U.D.C.	Surveyor, Offices of the Council, Midsomer Norton	do.
Excav'ting, Laying, etc., 5¼ miles c.i. Pipes, Masham	Harrowgate Corporation	E. W. Dixon, Engineer, 14, Albert-street, Harrogate.....	April 9
*Works and Materials for One Year	Paddington Borough Council	Borough Surveyor, Town Hall, Paddington, W.	do.
Sidings, etc., Foss Islands Depot.....	York Corporation.....	A. Creer, City Engineer, York	do.
*Road and Sewer Works	Hornsey Town Council	Borough Surveyor, Southwood-lane, Highgate, N.	April 11
R'n'w'l of Superst'cture of Underbridge over R. Isla	Caledonian Railway Company	Divisional Engineer, General Station, Perth.....	do.
Metalling	St. Mellons R.D.C.	Union Offices, Queen's Hill, Newport, Mon.....	do.
Metalling	Magor R.D.C.	do.	do.
1,500 Square Yards of Tarred or Asphalted Footways	Ryton U.D.C.	J. P. Dalton, Surveyor, Council Offices, Ryton-on-Tyne	do.
*Painting, Cleaning, etc., South Branch Library	M.B. of Fulham	Borough Engineer, Town Hall, Fulham, S.W.....	do.
Locomotives.....	Secretary of State for India	Director-General of Stores, India Office, Whitehall, S.W.....	April 12
*Building Materials and Tools for Various Prisons ..	The Prison Commissioners	Prison Commissioners, Home Office, Whitehall, S.W.	do.
Main Drainage of Bannockburn	Stirlingshire County Council	M'Luckie & Walker, C.E., 15, Dumbarton-road, Stirling	do.
Connecting House Drains to New System of Sewerage	Tutbury R.D.C.....	Willcox & Raikes, Eng'rs, Union-chambers, 63, Temple-row, Bir'hm	do.
Boundary Wall, etc., to Isolation Hospital, Mortlake	Barnes U.D.C.	G. Bruce Tomes, Surveyor, Council Offices, High-street, Mortlake	do.
Additions, etc., Electricity Station, High-st, Mortlake	do.	do.	do.
*Boundary Wall, Gates, and Fencing, etc.	do.	Council's Engineer, High-street, Mortlake	do.
*Painting & Cleaning, Brook Hospital, Shooter's Hill	Metropolitan Asylums Board.....	Office of the Board, Embankment, E.C.	do.
Underground Convenience near Pier	Blackpool Corporation.....	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	April 13
Tramway Extension	Lancaster Tramways Committee ..	W. A. Tester, Borough Tramways Engineer, Lancaster.....	April 14
Post Office, Airdrie.....	Com. of H.M. Works & Public B'ld'gs	The Secretary, Storey's Gate, London, S.W.	do.
High Tension Switchboard	Westminster Electric Supply Corp..	Kennedy & Jenkin, 17, Victoria-street, Westminster, S.W.....	April 18
Low Tension Switchboard.....	do.	do.	do.
60,000 to 70,000 Sleep Blocks, Dundalk	G.N.Ry. Co. (Ireland)	T. Morrison, Secretary, Amiens-street Terminus, Dublin	do.
*Furniture for Schools.....	West Ham Education Committee ..	W. Jacques, Architect, 2, Fen-court, E.C.	do.
Additions, etc., to Station Bldgs., Henley-on-Thames	G.W.R.	Office of Engineer, Paddington Station, London.....	April 19
House at Henley-on-Thames	do.	do.	do.
Branch Railway to Gasworks	Wallasey U.D.C.	J. H. Crowther, Engineer, Gasworks, Wallasey	April 20
*Making-up and Paving Road	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.....	do.
7,500 ft. Lineal of Granite Channel.....	Cheshunt U.D.C.	R. H. Jeffs, Engineer, Manor House, Cheshunt	April 21
*Erection of Infirmary, Leigh	The Committee.....	J. C. Prestwich, Bradshawgate-buildings, Leigh	April 22
Bridge over River Hope, near Hope Ferry	Sutherland County Council.....	A. Argo, County Clerk, Golspie	April 30
Elec. Equip., Ry. C'toms Bonded Wareh'se, Pt. Natal	Government of Natal	Sir W. Peace, Agent-General, 26, Victoria-street, Westminster ..	May 9
One 750-kilowatt Direct Current Steam Generator ..	Council of City of Melbourne	Agent-General for Victoria, 142, Queen Victoria-street, E.C.	May 13
Converting Farm B'ld'gs into Horse-boxes, Blackhall	Carlisle Race Stand Co., Ltd.....	Dixon & Mitchell, Devonshire-street, Carlisle	No date
Join'r's and Carp'nt'r's W'k (Labour only), 5 Houses	.....	W. & J. Pogson, Architects, Devonshire-street, Carlisle.....	do.
Pulling Down and Removal of Sheds.....	.....	W. F. Bullock, Palace-chambers, Hereford	do.
Theatre Royal, Southgate, Halifax.....	The Northern Theatre Co., Ltd.....	R. Horsfall & Son, Architects, 22A, Commercial-street, Halifax ..	do.
Town Hall in the Market-place	Corporation of Ossett	W. Hirst, Borough Surveyor, Ossett	do.
Pair of Cottages at Lexden, near Colchester.....	Regimental Cottage Homes Com. ..	A. Ainsworth Hunt, Architect, Sudbury	do.
Rebuilding the Robin Hood Inn, Hexham	.....	Liddle & Browne, Arch., Prudential-buildings, Newcastle-on-Tyne	do.
United Methodist Free Church, Whitley Bay	.....	W. H. Knowles, F.R.I.B.A., 37, Grainger-st., Newcastle-on-Tyne	do.
*Chimney Shaft (Labour only)	Holloway Bros. (London), Ltd.	Holloway Bros. (London), Ltd., Belvedere-road, S.E.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	Chorlton, etc., Joint Asylum Com. .	4*l.* 4s. per week	April 6
*Borough Surveyor	Borough of Gillingham	300*l.*.....	April 13
*Assistant Examiner in Office of H.M. Works, etc. ..	Civil Service Commission.....	Not stated	April 14
*Clerk of Works	Poplar Union.....	Not stated	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. xii. *Public Appointments*, xviii.

TENDERS.—*Continued from page* 349.

TOTTENHAM.—For the erection of municipal offices, baths, fire station, firemen's dwellings, mortuary, and coroner's court, for the Tottenham Urban District Council. Messrs. Tayler & Jemmett, architects. Mr. W. H. Prescott, A.M.Inst.C.E., Engineer to Council, Tottenham. Quantities by Messrs. Campbell & Son :—

—	Generally to the whole of the Works.	Office Block.	Baths and Chimney Shaft.	Fire Station and Firemen's Quarters.	Coroner's Court, Mortuary, etc.	Total of Tender, using Doulting Stone.	Extra for Portland Stone.	Total of Tender, using Portland Stone.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Albert Monk	2,378 0 0	19,008 0 0	28,956 0 0	6,390 0 0	1,421 0 0	58,153 0 0	605 0 0	58,758 0 0
A. J. Bateman	878 10 11	18,066 14 7	28,957 8 10	6,627 1 10	1,352 17 0	55,882 13 2	990 0 0	56,872 13 2
Thos. Broad, Ltd.	112 15 0	17,132 15 7	28,612 14 1	5,873 6 10	1,242 19 9	52,974 0 0	55 0 0	53,029 0 0
F. & E. Davey, Ltd.	147 0 0	17,720 0 0	26,264 0 0	6,074 0 0	1,352 0 0	51,557 0 0	850 0 0	52,407 0 0
H. Lovatt, Ltd.....	709 18 10	17,044 17 6	25,876 6 9	5,819 5 4	1,323 14 9	50,774 3 2	317 1 3	51,091 4 5
Rowley Bros.....	428 3 9	17,393 9 11	25,945 11 0	5,683 6 9	1,203 19 6	50,654 10 11	102 10 0	50,757 0 11
B. E. Nightingale.....	157 0 0	16,650 0 0	26,482 0 0	5,744 0 0	1,274 0 0	50,307 0 0	418 0 0	50,725 0 0
L. Whitehead & Co.....	100 0 0	17,130 0 0	26,025 0 0	5,730 0 0	1,215 0 0	50,200 0 0	470 0 0	50,670 0 0
F. Gough & Co.	573 0 0	16,880 0 0	25,652 0 0	5,633 0 0	1,214 0 0	49,952 0 0	650 0 0	50,602 0 0
J. W. Jerram	571 19 6	16,745 6 2	25,587 11 2	5,441 15 9	1,187 4 2	49,533 0 0	1,000 0 0	50,533 0 0
Chas. Wall, Ltd.	265 4 0	17,059 11 8	25,749 17 7	5,619 10 4	1,301 12 0	49,995 0 0	420 12 0	50,415 12 0
C. Miskin & Sons	215 0 0	17,408 0 0	25,204 0 0	5,734 0 0	1,219 0 0	49,780 0 0	300 0 0	50,080 0 0
Todd & Newman	750 0 0	16,369 0 0	25,317 0 0	5,549 0 0	1,242 0 0	49,227 0 0	692 0 0	49,919 0 0
Holliday & Greenwood	250 0 0	16,665 0 0	25,540 0 0	5,540 0 0	1,208 0 0	49,203 0 0	400 0 0	49,603 0 0
F. G. Minter	114 0 0	16,591 0 0	25,898 0 0	5,741 0 0	1,200 0 0	49,544 0 0	—	49,544 0 0
McCormick & Sons	542 0 0	16,397 0 0	25,056 0 0	5,439 0 0	1,166 0 0	48,600 0 0	840 0 0	49,440 0 0
William Downs	595 0 0	16,495 0 0	25,203 0 0	5,356 0 0	1,172 0 0	48,821 0 0	561 0 0	49,382 0 0
Leslie & Co., Ltd.	238 0 0	16,793 0 0	24,888 0 0	5,359 0 0	1,194 0 0	48,472 0 0	785 0 0	49,257 0 0
Walter Wallis	295 2 6	16,375 14 3	24,822 12 10	5,869 3 7	1,248 17 9	48,611 10 11	451 0 0	49,062 10 11
J. Chessum & Sons	396 0 0	16,468 0 0	25,065 0 0	5,430 0 0	1,206 0 0	48,565 0 0	432 0 0	48,997 0 0
H. Knight & Son	116 8 4	16,279 5 3	24,609 10 5	5,429 5 9	1,185 14 9	47,620 10 6	908 0 0	48,528 10 6
Hughes & Stirling.....	522 17 6	15,875 4 5	24,525 12 3	5,256 18 7	1,203 17 0	47,737 0 0	580 0 0	48,317 0 0
G. Godson & Sons.....	371 0 0	15,602 0 0	25,173 0 0	5,491 0 0	1,197 0 0	47,834 0 0	440 0 0	48,274 0 0
Arthur Porter	151 16 0	16,112 16 1	24,787 16 8	5,452 13 10	1,160 14 10	47,665 0 0	208 10 7	47,873 10 7
W. Lawrence & Son, Waltham Cross*	112 0 0	15,934 0 0	24,432 0 0	5,304 0 0	1,192 0 0	46,974 0 0	607 10 0	47,581 10 0

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NORWICH.—Accepted for painting certain schools, for the Education Committee. Mr. C. J. Brown, architect, Cathedral Offices, The Close, Norwich:—

Angel-road School.

G. Marshall, Heath-road, Norwich .. £46 0 0

Bull Close-road School.

G. Marshall, Heath-road, Norwich .. 13 5 0

Avenue-road School.

S. H. Wiley, Mancroft-street, Norwich 40 0 0

Rosebery-road School.

J. W. King, Southwell-road, Norwich 11 15 0

Quay Side School.

T. Horth, Magdalen-road, Norwich.. 22 0 0

St. Paul's School.

T. Horth, Magdalen-road, Norwich.. 9 0 0

Thorpe Hamlet School.

E. E. Huggins, St. Leonard's-road, Norwich 32 0 0

PLYMOUTH.—For the construction of a new wharf in Cattewater Harbour, dredging, &c., for the Council of the Borough. Sir J. Wolfe Barry, Engineer, 21, Delahay-street, Westminster:—

Messrs. Matcham & Co., Mount Pleasant, Plymouth* 20,186 0 0

(The wharf will be 600 ft.)

ROMFORD.—For the erection of an engine-shed and general depot on the Rainham-road, for the Rural District Council. Mr. E. G. Boden, Surveyor, Victoria-chambers, Romford. Quantities by Mr. Ernest J. Little, Brentwood-road, Romford:—

Fasey & Morton	£876	0	10
J. Appleby & Son	780	0	0
J. S. Hammond & Son	779	0	0
Myall & Upson	746	0	0
J. Wilson	745	0	0
Foster Bros.	716	0	0
J. Ferguson & Co.	715	16	0
T. G. Sharpington	708	0	0
A. Gray	698	0	0
T. Pearce	£690	0	0
Dowsing & Davis	685	0	0
F. Gowan	679	0	0
S. E. Moss & Co.	677	10	0
C. North	657	0	0
T. Bruty	643	0	0
R. Woollaston & Co.	604	0	0
H. C. Hosswill	599	0	0
W. E. Westgate, Romford*	549	0	0

SANDWICH.—For laying a 9 in. sewer, 1,790 ft. long, for the Town Council. Mr. A. J. Firby, Borough Surveyor, Sandwich:—

J. Weston	£378		
A. G. Osenton	299		
J. E. Turner	280		
Road Maintenance Co.	249		
G. Keeler	244		
E. T. Turner	£241		
A. W. Simmons	235		
W. Wilson	230		
C. Castle & Co., Westgate-on-Sea*	208		

SURBITON.—For the erection of a Baptist chapel in the Balaclava-road. Mr. Alfred Mason, architect, Broughton-chambers, Surbiton:—

W. H. Young	£2,596	0	0
Lane & Son	2,574	0	0
Ellis & Turner	2,550	0	0
Crabb & Son	2,539	0	0
Leonard & Mason	2,535	0	0
Mussellwhite & Sapp	2,534	0	0
J. Cassé	2,497	0	0
H. Bishopp	2,428	10	4
Rice & Son	2,397	0	0
G. F. Havell	2,367	0	0
E. Alsford	2,350	0	0
H. Buckingham	2,313	0	0
E. Chamberlain	£2,300	0	0
Gaze & Sons	2,279	0	0
Cropley Bros.	2,197	0	0
B. E. Nightingale	2,183	0	0
Ferguson & Co.	2,170	0	0
Braid, Pater, & Co., Ltd.	2,166	0	0
Aldridge & Son	2,149	14	0
Dean & Co.	2,130	10	0
E. Thorogood	2,120	0	0
Foster Bros.	2,111	0	0
F. Hawkey	2,042	0	0
Gurr & Sons, Chiswick	1,998	10	0

SOUTHAMPTON.—For 750 tons of granite setts, 2,000 cubic yds. of ballast, and 300 tons of cement, for the Corporation. Mr. J. A. Crowther, Borough Engineer:—

Granite Setts.

L. Sommerfeld, London.... £1 6 9 per ton.

Ballast.

Crampton & Co., Portsmouth 0 2 8 per cubic yd.

Cement.

W. Dibben, Southampton.. 1 7 0 per ton.

TIVERTON.—For buildings for electricity works, near the Gasworks. Mr. J. Siddalls, Borough Engineer, Town Hall, Tiverton:—

R. Wilkins & Sons	£1,969	0	0
W. C. Bennett	1,706	15	0
Parr, Thorne, & Stenner	1,633	0	0
R. Grater & Sons	£1,546	0	0
S. Manning	1,490	2	4
J. Grater & Sons	1,484	0	0

TUNBRIDGE WELLS.—For the erection of a house at Penbury, Tunbridge Wells, for Miss Molesworth. Messrs. C. E. Mallows and G. H. Grocock, architects, 28, Conduit-street, Hanover-square, W.:—

Luxford	£4,654		
Saint	4,493		
Soper & Jones	4,460		
Mansfield & Son	4,404		
Jarvis & Son	4,358		
Burr	£4,310		
Crates & Son	4,250		
Strange & Son*	4,070		
Leney & Son	3,980		

WELLINGTON (Salop).—For pipes, sluices, hydrants, etc., and laying same, for the Urban District Council. Mr. G. Riley, Surveyor, 45, Walker-street, Wellington:—

W. Jowett, Prescot, Lancs. .... £1,655 19 7 / 1,402 6 1

WELLINGTON (Somersetshire).—For sewers and sewage purification works, for the Urban District Council. Mr. C. J. Lomax, A.M.Inst.C.E., 37, Cross-street, Manchester:—

*Follett Bros., Builders, etc., Wellington, Somerset £14,560 2 3

WEST HAM.—For making-up Cambus-road and Carson-road, for the Borough Council. Mr. John G. Morley, Borough Engineer, Town Hall, West Ham, E.:—

Griffiths & Co., Ltd.	£2038	2	0
J. Jackson	2017	9	0
T. Adams	1992	8	0
D. T. Jackson	1855	1	0
Parsons & Parsons	£1819	7	2
G. Anderson, Poplar*	1747	18	8

WIDNES.—For improvements in ten streets and eighteen passages at Simms Cross, for the Corporation. Mr. J. S. Sinclair, A.M.Inst.C.E., Borough Surveyor, Town Hall:—

W. Shepherd	£12,179	5	2
Heaton Bros. & Son	11,722	0	0
H. Garner & W. Gwen	11,039	14	4
W. Standing	10,824	0	0
Executors of late W. F. Chadwick	10,123	2	4
S. Hayward	10,066	16	10
Bennie & Thompson	9,986	12	11
T. Hindley	9,932	8	8
S. Cowburn & Sons, Hindley, Wigan*	8,805	15	4

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London Agent:—Mr E. A. Williams, 16, Craven-street, Strand.

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VOL. LXXXVI.—No. 3191. APRIL 2, 1904.

ILLUSTRATIONS.

Sketches in Normandy.....By Mr. W. Curtis Green.
Inebriates' Home, Lingfield Colony.....Mr. T. Phillips Figgis, F.R.I.B.A., Architect.
Billiard Room, Polapit Tamar, Launceston.....Mr. R. P. Whellock, A.R.I.B.A., Architect.
Hall and Staircase, Stifford Lodge.....Mr. Christopher M. Shiner, A.R.I.B.A., Architect.
Vicarage, Lindfield.....Mr. Walter Millard, A.R.I.B.A., Architect.

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New Royal Infirmary, Manchester.

THE designs submitted in competition for this important building have been on view at the Town Hall, Manchester, for the last week, and form a very interesting and instructive exhibition. The competition was limited to twelve architects, chosen by the Board from those who made application in answer to an advertisement in April last. The instructions to the competing architects were issued at the end of July, and five months were allowed for the preparation of the designs. The conditions of the competition appear to have been fair and reasonable, the name of the assessor (Mr. John J. Burnet, A.R.S.A., F.R.I.B.A.) being stated, and an undertaking being given that "unless some insuperable obstacle prevents," the author of the design placed first by the assessor will be appointed architect for the hospital. Each architect submitting a design in accordance with the conditions was promised a fee of one hundred guineas "towards his expenses." We are glad to note this expression, as it shows that the members of the Board had some idea of the enormous labour involved in the preparation of a design for a building of this magnitude; many people seem to think that architectural drawings are produced as quickly as mushrooms, and would refuse to believe any one who said that the drawings submitted in this competition, for example, had cost the authors months of hard work in addition to an expenditure in hard cash of two or three thousand pounds. The thanks of the competitors in this case are due to the Board and their assessor for restricting the number of drawings and for adopting a scale of 16 ft. to an inch for the plans, elevations and sections, but even under these conditions the labour involved has been enormous.

The problem was to provide accommodation in the wards for 504 beds, and for future extension to a total of 600 beds. The wards were to be arranged in two main sections, medical and surgical, and in a number of smaller sections, the medical section being divided into four "staff units," each with twenty-five male and twenty female beds, under the charge of one physician and his assistant, and the surgical section into the same number of units, each with thirty-five male, and twenty-three female beds, under the charge of one surgeon and an assistant surgeon. In addition to the two principal wards, three or four small wards were required in each unit, together with the usual conveniences, kitchens, cistern-rooms, etc. These eight staff units account for 412 beds. The gynæcological department, and the eye, ear and skin departments constitute two other units, with a total of fifty-four beds. The remaining thirty-eight beds are devoted to burns, venereal diseases, isolation, or sceptic cases, and casualties. Six operating theatres, with all the necessary subsidiary rooms, were required in connexion with six of the units. The out-patients' department for 400 patients, the pharmacy, the in-patients' waiting rooms, the electrical and bath department, the pathological and post mortem department, and the teaching department added to the complexity of the problem. The administrative, nursing, and domestic requirements were also on a formidable scale, and included accommodation for thirty-six non-resident and 332 resident officers; for the resident officers, thirty-three sitting-rooms, seven dining-rooms, 249 bedrooms, thirty-eight bath-rooms, and forty-one water-closets, were required; in addition to these provision must be made for kitchens, store-rooms, reading-rooms, billiard-room, two entrance lodges, a number of offices, board and committee rooms, library, workshops, laundry, and boiler-house, and general stores, etc.

The arrangement of all these rooms in the different buildings is no easy task, and in this case the problem was rendered exceptionally difficult by the restricted area and curious shape of the site. Imagine a plot of ground approximately square, bounded on the west, or principal front by Oxford-road, on the north by Nelson-street, on the east by buildings and smaller streets, and on the south by York-place. Imagine further that the Royal Eye Hospital occupies an oblong site in the north-west angle of the square, that other buildings occupy a larger and less regular area in the north-east angle, that the Cancer Hospital is placed on a long and narrow portion of the square in the south-east angle, and that a chapel stands in the fourth corner. The irregular cross which remains is the site of the new infirmary. It is not surprising that the competitors have found it difficult to arrange the buildings on the site in a simple and convenient manner. The wonder is not that so many have failed, but that so many have done so well. In the greater number

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of the designs, the internal planning of the various buildings is more defective than the arrangement of the buildings on the site, but it is also true that the latter is in many cases responsible for some of the defects of planning. Many examples might be given of the way in which the plans of the various buildings have been modified by the shape of the site, but one conspicuous example will suffice, namely, the shape of the large wards. The instructions are not explicit, but certainly seem to require rectangular wards; some of the competitors, including the authors of the premiated design, have failed to find sufficient space for this shape in every case, and have, therefore, adopted the circular form for some of the wards, while one has adopted pairs of wards arranged like the letter V, and another shows Y-shaped wards.

Design A, by Mr. W. Cecil Hardisty, of Manchester, shows the teaching department in the middle of the Oxford-road front, with the administration block to the left, and the nurses' home to the right. The kitchen and stores block is behind the teaching department, the kitchen being on the second floor and the housekeeper's, servants', and nurses' dining-rooms on the ground floor. The medical officers' dining-room is on the north side of the administration block, about a hundred yards from the service lifts. The bedrooms of the servants and medical officers are not properly separated, and the quadrangular arrangement of the nurses' home is a mistake. The author, like most of the competitors, has arranged the ward pavilions on two covered ways or corridors running in a direction approximately at right angles to the front and back of the site. The left-hand or northerly corridor affords access to four three-storied surgical pavilions and one one-storied gynæcological pavilion, all of which are well placed on the south side of the corridor. The difficult problem of furnishing the required numbers of male and female beds has been solved in an original manner by placing the twenty female beds on the ground floor and by making the two upper wards smaller, so as to accommodate sixteen male beds each; this is effected by carrying the south ends of the upper wards on girders across the female wards, and the flat roofs of those portions of the lower wards which extend beyond the upper wards are utilised as sun-rooms and balconies for the wards on the middle floor. The southerly corridor gives access to four two-storied medical pavilions, arranged in a similar manner, with twenty-two male beds on the ground floor and eighteen female beds on the first floor; space is provided adjoining this corridor for an additional pavilion. The block plan is somewhat crowded, the chapel is wrongly placed at the back extremity of one of the corridors, and the internal arrangements of the buildings are in many respects unsatisfactory.

Design B, by Mr. Edwin T. Hall, of London, and Mr. John Brooke, of Manchester, has been placed first by the assessor. It is an extremely able design, and the authors thoroughly deserve the honour of first place. The block plan is simple and (as far as the principal buildings are concerned) not too crowded, and the internal arrangements are admirably planned; it is clear that the authors have fully realised the importance of rendering the administration and supervision of the hospital as easy and convenient as possible. The administration block is placed in the middle of the Oxford-road front, with the nurses' home to the right and the teaching department to the left; behind the latter is a block forming three sides of a square on the ground floor and containing the in-patients' and casualty departments and some of the baths on this floor and the venereal wards and additional baths in an upper story. The kitchen and stores department and three dining-rooms are immediately behind the administration block and connected with it, and between the former and the in-patients' and casualty department the chapel is placed. All the buildings mentioned above are cleverly grouped to occupy a rectangular portion of the site, and present a symmetrical front to Oxford-road. They are somewhat crowded, but the arrangement has the great advantage of leaving a large area for the ward pavilions and other buildings.

A covered way runs from the teaching department along the south side of the in-patients' block, and a similar way runs along the north side of the nurses' home; these are continued to the back of the site in straight lines to form the approaches to the pavilions and laundry. The northern corridor has four surgical pavilions on the right and two on the left, one of the latter being circular and, by the way, having too much blank wall near the entrance; these pavilions are of two stories, and accommodate two units on each floor. There are also two operating theatres on each floor to the left of the corridor. This corridor extends in a direct line to the laundry, which is placed in the small rear arm of the cross-shaped site. The southerly corridor has four two storied medical pavilions on the south side, and is continued to a transverse corridor, which runs in a northerly direction to the laundry and in a southerly direction to the isolation wards adjoining York-place. Immediately behind the rectangular group of buildings in the front part of the site there is another transverse covered way parallel to Oxford-road and connecting the two ward corridors. Midway between these the transverse way is joined by a short branch to the kitchen department, the kitchen itself being conveniently placed on the first floor. The transverse corridor is continued in a northerly direction towards Nelson-street, and affords access to a pavilion on the west side, containing wards on the ground floor for eye, ear, and skin cases, and a gynæcological ward on the first floor; the operating theatres and out-patients' department are on the east side of the covered way, the latter building being also approached from Nelson-street. In a southerly direction the covered way is continued to the mortuary or pathological department, which abuts on York-place. The boilers are placed in the laundry block, and behind this are the workshops, coal and wood stores, etc., the stores being approached by covered ways connected with those already described. These ways are lightly constructed of iron and glass, and are only about 7 ft. high, so that there is a thorough circulation of air between the two stories. Between the surgical pavilions sun balconies are formed along the south side of the covered way, and stairs are provided for access to the grounds. Other balconies are shown at the free ends of the wards between the sanitary towers, which are placed diagonally at the corners of the pavilions. The operating theatres are approached from the covered ways through short cross-lighted lobbies, and are very conveniently arranged; a special feature is that the surgeon's room and testing-room are grouped with each theatre, and the water-closet adjoining the surgeon's room is a convenience which has not, we believe, been provided by any of the other competitors.

The staff dining-rooms are cleverly arranged for convenient service, and a happy idea is embodied in this part of the plan, the large dining-room for the nurses having a wide archway between it and one of the smaller dining-rooms, so that the two can be used together as a recreation-room; it is also arranged that the dining-tables can be placed close together in the smaller room to form a raised platform for entertainments of various kinds. The staircases in the front group of buildings are also well arranged to afford easy exit in case of fire, and are continued up to the flat roofs, from which a descent could be made at any point by an ordinary fire-escape. The flat roofs are a notable feature of the design. They will prove useful as promenades for the patients and staff, and those over the wards have the further advantage of allowing another story to be added at very little expense. Here again the authors have solved the problem of future extension more happily than many of their competitors. By providing for this extension by means of an additional story, instead of by additional pavilions, they have been able to utilise the whole of the site, and thus avoid undue crowding of the pavilions. The arrangement is also economical. According to the *Manchester Guardian*, Mr. Burnet states in his report that the estimated cost of the buildings is 324,000*l*., and that the cost of increasing the accommodation by 100 beds will be only 16,500*l*. It is perhaps worth while to mention in passing that the authors have arranged the drawings of the principal floors in such a way that all the buildings can be seen in their relative positions by simply grouping the stretchers in the manner indicated by a diagram on the block plan.

Two designs for the external treatment of the Oxford-road front are shown, the "alternative" design being selected, although in some respects it is certainly inferior to the other. The principal difference is that in the alternative design the columns and pilasters occupy the two uppermost of the four stories, while in the other (which, we presume, the authors prefer), they occupy the two middle stories, and are surmounted by an attic story. The buildings will certainly group well, the administration block being the central feature, with a low tower and cupola in the middle over the principal entrance. The teaching department and nurses' home form two projecting wings, symmetrically treated,

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and are connected to the central block by the first-floor corridors carried on wide archways. The buildings thus form three sides of a large entrance court, and at each of the two front angles of this court a projecting staircase is carried up as a tower. The design of these towers leaves something to be desired; the lower part is certainly feeble, and has no relation to the upper part. An improvement would be effected by stopping the main cornice of the buildings against the towers, instead of carrying it around them, but this would necessitate other alterations. There are many other points of interest in these plans, but we must pass on to design C, the work of Messrs. Waddington, Son, and Dunkerley, of Manchester. The block plan shows a covered way or corridor forming a quadrangle in the centre of the site, and in the quadrangle are two double or V-shaped ward-pavilions facing each other thus—< >. The small rooms are placed at the angles. The ward-corridors are not well lighted, and the shape of the pavilions would seriously interfere with the circulation of the air. Other rectangular pavilions are grouped around the quadrangular covered way. The out-patients' department has the large hall on one side, an arrangement which is much less satisfactory than the usual central position; the smaller rooms are extravagantly designed, the consultation rooms being about 25 ft. high. The administration block contains six stories in addition to the basement and the story in the roof; a lofty building of this kind would be both inconvenient and dangerous.

Design D, by Mr. John W. Simpson, of London, possesses many interesting features, but is certainly inferior to the selected design, and to one or two others. This is the more to be regretted as Mr. Simpson's design for the re-building of the infirmary on the Piccadilly site was accepted by the Board some years ago, and it is certainly "hard lines" for him that the scheme has been abandoned. In his design for the new scheme he has in several instances allowed his feeling for architectural effect to get the better of his judgment. This is a failing which leans to virtue's side, but in a design for a strictly utilitarian building like a hospital it is nevertheless prejudicial to success. The nurses' home occupies the Oxford-road front, and the administration block and casualty department are placed behind it, forming together a quadrangle with openings in the middle of the north and south sides. An arched entrance for carriages leads through the centre of the nurses' home to the "Great Court," and to the administration block. The two principal entrances to the nurses' home are in this court. One of the defects of this arrangement is that the nurses' home is cut into two separate parts on the ground and mezzanine floors by the carriage-entrance, the arch of which also blocks the ends of the corridors on the mezzanine floor, and interferes with their lighting and ventilation. The north wing of the administration block has the casualty department on the ground-floor, the rooms being arranged around a top-lighted "main surgery" in the centre, on the first floor are four wards (two for burns and two for venereal cases) with subsidiary rooms, the whole forming a quadrangle around the toplight of the surgery; the house-surgeon's rooms are arranged in a similar manner on the second floor, and the housekeepers' and servants' rooms on the third floor. The quadrangular arrangement of the wards is a mistake, and it is also a mistake to place bedrooms over the wards. We fear that the desire to obtain a dignified "great court" is responsible for these defects of plan. The south wing of the administration block is similarly treated, with the secretary's offices, board-room, etc., on the ground floor; three dining-rooms, billiard-room, etc., on the first; servants' dining-rooms, etc., on the second; and kitchen department on the third. The central portion of the administration block has the in-patients' department, electrical and X-ray rooms, and library on the ground floor, and the medical officers' rooms above. The board-room and chapel are planned for architectural effect. The ward pavilions are arranged on two main covered ways, and no less than four are circular. The operating theatres are well arranged, but are so placed as to interfere somewhat with the circulation of the air around the wards. The block plan is crowded, and has the appearance of a number of quadrangles.

Design E, by Messrs. J. Thomson and R. D. Sandilands, of Glasgow, also suffers from overcrowding in consequence of space being left for two additional pavilions. There is a long range of buildings on the Oxford-road front, with the administration department in the centre, the medical nurses' home being on one side of this and the surgical nurses' home on the other. This separation of the nurses is not a good feature, although it affords easy access to the pavilions, as the medical wards are placed on a covered way leading from the medical nurses' home towards the rear of the site, and the surgical wards in a corresponding corridor leading from the other home. The kitchen department and three dining-rooms are inconveniently placed in the back part of the site behind one group of ward pavilions. The one-bed and two-bed wards are built out at right angles to the main roads, and although this arrangement has some advantages, it leads in this case to overcrowding and interferes with the lighting of the day-rooms and with the circulation of air between the pavilions. The circular plan has been adopted for some of the wards.

Design F, by Messrs. Campbell Douglas and A. N. Paterson, of Glasgow, is somewhat out of the beaten track. The nurses' home is placed in the south arm of the site adjoining York-place. Another feature is the provision of three covered ways for access to the ward pavilions; this arrangement has the advantage of allowing all the pavilions to be placed on the south side of the covered ways, and the balconies at the south ends thus obtain the full benefit of the sunshine. On the other hand, it is not as convenient as the simpler plans adopted by some of the other competitors. Each of the two surgical corridors affords access to three surgical pavilions, and one of them leads also to the pavilion containing the eye, ear, and skin wards and the gynæcological ward. The third corridor has four medical pavilions adjoining it, and behind these space is provided for two additional pavilions. The administration block is in the middle of the Oxford-road front, with the casualty department to the left, teaching department to the right, and stores and dining-rooms in the rear. The kitchen is on the second floor of the administration block. The stairs and entrances in this building are not well arranged; the main portion is more than 150 ft. in length, and contains only one staircase from the ground to the first floor, and this is at one end. The external treatment is good, the principal feature being a dome over the centre of the administration block.

Design G, by Messrs. Heathcote and Sons, of Manchester, is much less satisfactory. The scheme is spoilt by the huge block of buildings on the Oxford-road front; this is nearly 500 ft. long and 115 ft. deep, and contains four large open courts. The principal entrance appears to be in the rear of the block, and leads through a vestibule into a hall 76 ft. by 44 ft. The laundry is badly placed in a basement under the casualty department and part of the administration block. The ward pavilions are cleverly planned on both sides of a single corridor—an arrangement which has been adopted by only one other competitor.

Mr. H. Percy Adams, of London, submitted two designs, H and I, both of which have the ward pavilions arranged on the two-corridor plan adopted by so many of the competitors; in the first design the corridors are approximately at right angles to Oxford-road, but in the second they run diagonally in the same direction as the single corridor in Messrs. Heathcote and Sons' design. The block plan of H is the simpler of the two, but the buildings themselves are less satisfactory. The casualty department is on the left and the nurses' home on the right of an arched carriage entrance leading from Oxford-road to the large quadrangle, which has the in-patients' department on the left, stores, etc., on the right, and administration block in the rear. The chapel is in the rear right-hand corner, and an operating theatre in the corresponding left-hand corner. The corridors of the side portions of the quadrangle are, as in the selected design, continued in straight lines for access to the wards; the northerly covered way has two surgical pavilions on the north side and four on the south; and the southerly one has four medical pavilions on the south side. All the pavilions are of two stories, and in the rear of each group space is left for an additional pavilion. The isolation block is placed between the two groups, and is less than 20 ft. from one of the medical pavilions. The laundry is in the back arm of the site, the out-patients' department in the north arm, and the teaching and pathological departments in the south. The kitchen is on the third floor of the administration block. In the second design the kitchen is more conveniently placed on the first floor of the back portion of the H-shaped administration block. As in the selected design, this building is set back from Oxford-

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road, and has the nurses' home to the right and the teaching department to the left, the three buildings forming three sides of a large forecourt. Space is left for two additional pavilions. The details of the wards are good, but in some of the pavilions the only balconies are small ones in connexion with the day-rooms. The two designs are much above the average.

Design K, by Messrs. Thomas Worthington and Son, of Manchester, has a block plan of original type, and of considerable merit. The administration block adjoins Oxford-road, and has two projecting wings, the north containing the teaching department and the south the secretary's offices, board-room, etc. From the middle of the administration block a single covered way runs to a large staircase in the centre of the site; this corridor has two medical pavilions on each side. At the staircase the corridor branches at right angles to the right and left, and each branch turns again at right angles, and is continued towards the rear of the site in a direction parallel to that of the main corridor. Each of the two rear corridors has three surgical pavilions on the south side. The transverse corridor leading from the central staircase is continued in a northerly direction to the casualty department, and beyond this is the out-patients' department adjoining Nelson-street. The septic wards are on the same side of the site, and the laundry and pathological department adjoining York-place; the boilers are in the back area of the site, at an inconvenient distance from the laundry. The administration block is the worst part of the plans. On the first floor the resident medical and surgical officers' quarters occupy the left-hand half, and some of the nurses' quarters are in the right-hand half, the two communicating by a gallery around the upper part of the central hall. There is only one staircase for the doctors from the ground to the first floor, and this is close to the central hall, the landing being 200 ft. from the door of the furthest room. Two stairs are provided from the ground to the first floor for access to the nurses' quarters, and two also for access to other nurses' and probationers' rooms on the second floor, but one of these stairs is not over either of the stairs below. It is true that emergency stairs are shown outside the building, and that a separate "service" staircase is provided in an annex behind the administration block. The building has six stories and a basement, and the kitchen is on the top floor.

Design L, by Messrs. Young and Hall, of London, has a very simple block plan with the ward pavilions arranged on the two sides of a single corridor, running from the administration block in the middle of the Oxford-road front towards the back of the site. This corridor affords access to a chapel (on the left) and eye, ear, and skin wards on the right, two female medical pavilions on the left and two male on the right, one female surgical pavilion on the left and one on the right, one group consisting of two circular male pavilions and an oblong block of small wards and accessory rooms on the left, and a similar group on the right, and finally to the operating theatres. The isolation wards are placed in the back arm of the site, the pathological department in the south arm and the out-patients' department in the north arm, with two parallel blocks for in-patients and casualties between this and the female medical wards. The nurses' home is to the left of the administration block and the teaching department to the right. The general arrangement is undoubtedly simple and convenient. The wards themselves appear to us to be less satisfactory. Five of the eight principal pavilions are three stories high, and nearly all have the balconies on the west side, the ends furthest from the corridor being blocked by the large sanitary towers. The kitchen is on the fourth floor of the administration block, the lifts being conveniently placed for service, but more space might with advantage have been given for trolleys on the principal floors. The operating theatres are well arranged. Altogether this is an able design.

Mr. A. Hessell Tiltman, of London (design M), has solved some of the difficulties of the problem in a manner remarkably similar to the selected design. He has the same arrangement of buildings adjoining Oxford-road, namely, the administration block in the middle, the teaching department on the left, and the nurses' home on the right. He has the same two ward-corridors, the northerly affording access to four oblong surgical pavilions on the right, and two surgical pavilions (both of these being, however, circular), and one composite block, for eye, ear, and skin cases, etc., on the left, and the southerly corridor having four oblong medical pavilions on the right or south side. The sanitary towers are also placed at the angles of the pavilions, with balconies between, and to complete the resemblance the wards have flat roofs, and future extension is suggested by means of an additional story. In some other respects the arrangement is different from the selected design, the isolation wards being in the back arm of the site and the laundry and workshops in the south arm, instead of *vice versâ*. The kitchen is on the fourth floor of the administration block, and near it the lifts are placed leading down to all the floors below. Some of the details are less satisfactory; thus, the anæsthetising rooms do not communicate directly with the operating theatres, and the separation of the different departments in the administration block is not as thorough as in the selected design. The Oxford-road front is well treated externally, with a range of coupled columns and two small towers.

The last design is by Messrs. Henman and Cooper, of Birmingham, and has a simple block plan with a single main covered way, having four principal pavilions on each side, and a smaller pavilion for eye, ear, and skin cases in the middle and south side. A second covered way to the left of the main one and not quite parallel to it leads from the left end of the administration block past the casualty department to the laundry and out-patients' department in the north arm of the site. The eight principal pavilions have Y-shaped wards, which occupy a great width and seriously reduce the air-space between the buildings; thus, the extreme angles of two of the adjacent pavilions are within 6 ft. of each other. The acute-angled space between the two arms of the wards does not allow a good circulation of air. There is a large amount of space in the ward corridors, and some of these are not well lighted. The plans as a whole are too much cut up, a great number of recesses and angles being formed. The nurses' home and administration block, facing Oxford-road, are five stories high, in addition to the story in the mansard roof.

We certainly think that the assessor has selected the best design. As far as we know, he has not stated which designs, in his opinion, approximate most closely in merit to the design selected. In conclusion we may add that the instructions to architects contained a clause to the effect that the Board had decided against the Plenum system of ventilation, and that the heating must be by "hot-water radiation and open fire-places."

THE ARCHITECTURAL ASSOCIATION SKETCH-BOOK.

WE have seen finer and more effective drawings in some former volumes of the *Architectural Association Sketch-book* than any which appear in volume 7 of the Third Series; but the general level of excellence is well maintained, and it is perhaps a merit that there is a larger proportion than there used to be of measured drawings, which are more useful to students of architecture than picturesque sketches, though not so fascinating to look at.

Of the seventy-seven plates, sixty-five are of English subjects, and the volume opens appropriately with Mr. Richardson's measured drawings of Wren's portion of the old Christ's Hospital—a commemoration in drawing of a building which has had its day, and which, truth to say, is valuable rather for the name of Wren and the historic associations of the place than for architectural beauty. The elevation as a whole is pleasing in its naïve simplicity and symmetrical balance; the end pavilions, when shown in detail, are but ugly and commonplace architecture. Mr. C. C. Brewer's sketches of bits of picturesque buildings in the north of France are interesting; they are described as "crayon sketches on brown paper"; the originals, we suppose, are on brown paper touched with white. It is possible to produce nearly a facsimile of this kind of work by printing the lithographs on brown paper; it might have been worth while to try this; as it is, the reproductions no doubt lose a good deal of the effect of the originals. The most interesting of the sketches is the first one, of a house at Vitré, the ground story nearly all window, the upper portion corbelled over on two series of very boldly moulded beams, stopped by a corbelled out buttress at either end. It is curious how what we condemn in modern building is condoned in ancient; the windows are not plate glass, it is true, they have pretty thick wooden bars, yet the corbel over the glazed door is as absolutely unstructural in appearance as any London shop with a plate glass ground story carrying a wall over it. The elevation of the Horse Guards is very

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carefully drawn by Mr. W. Hawke, and looks charming, even better than it does in reality, for this type of design looks best when shown new and clean than in its weather-stained reality. Mr. Edwin Gunn's set of measured drawings of "The Great House, Leyton," form an excellent and very interesting series, not least so in regard to the plan, which may be called a grandiose plan on a small scale, though the long dining-room must be dark at the upper end. The exterior is one of the severely prim Georgian brick elevations with brick pilasters, but the staircase and interior details are excellent. Wren's gate-house to Middle Temple lane, drawn by Mr. Richardson, is the best bit of work of this class in Part I. of the *Sketch-book*, and serves to remind us what a good thing people pass constantly with little notice. The old iron work of the door of Dartmouth Church, by Mr. de Gruchy, was worth drawing as a curiosity; but it is barbarous work, with its grotesque leopards and quasi-naturalistic metal foliage, a sort of stuff that is no more good in the Middle Ages than it would be now; and then we turn the page and are in another world with Mr. Salway Nicol's delicate and careful elevation drawing of the Porta della Carta of the Ducal Palace. How one feels at once the sense of style which belongs to Italian work. The Dartmouth door is but a country workman's bungle in comparison.

When we open Part II. and find Mr. Fulton's finely-drawn elevation of the gateway and screen of St. John's College, it is from Italy again that the elevation of style comes; Italian influence acting on the taste and accomplishment of Inigo Jones. The stalls of Beverley have style too, not derived from Italy, and are admirably drawn by Mr. de Gruchy. Mr. Bossom's measured drawings of St. Mary Woolnoth have been published, or partly so, in our pages; we still think it is a pity that the exterior front was not drawn. If ever that church is destroyed (and there are vandals who hunger for its destruction), we shall at least want a memorial of one of the most remarkable façades in London. Mr. Bossom gives a sheet of the very refined mouldings and other details.

Mr. Marvin's two sheets of chimney-tops from foreign sources are really interesting, the Italian examples even more so than the German, though some of the latter are highly characteristic in a quaint and naïve manner.

Kirby and Apethorpe are rather worked out now, though Mr. Tanner's two drawings are two of the best in the collection. Mr. H. A. Hall's dining-room from Coles Farm, Box (Wiltshire), gives in two measured drawings two sides of what must be a charming old country room, wainscotted in stile and panel all over—"all mouldings worked solid" is a note on the drawing—and with carved panels and a delicately profiled cornice in the upper portion. Coles Farm, says the author's note, is a typical stone farmhouse built in 1649. The panelling is of oak, and there is a fine plaster ceiling, shown in another drawing; details of the carved panels are also given. The house, we learn, is in a very neglected state, and some of the panelling has been removed since the drawings were made.

Aston Hall, an over-rated building, forms the subject of measured drawings by Mr. E. F. Reynolds. We are more interested by Mr. Bossom's carefully-executed line perspective of Lord Burlington's villa at Chiswick, showing very well the stately effect of the steps and portico. Among other things in Part IV. are an excellent set of elevations, plan, and view of Eastbury House, by Mr. Marvin; a coloured plate of wall tiles from the Casa de Pilatos, Seville, by Mr. Prentice; a very bold and effective brush sketch of a carved panel in King's College Chapel, by Mr. F. C. Mears; two admirable and most artistic sketches of portions of Burgos and Salamanca Cathedrals, by Mr. Prentice, and a fine drawing of King's College screen and organ, by Mr. Mears.

NOTES.

The Metric System. NO DOUBT the French mètre fails to comply with the requirements of scientific and ideal perfection, and there may be those who agree with the view expressed years ago by Sir John Herschel that the mètre is not a good unit of measure because it corresponds with a fraction of a local rather than a universal dimension of the earth. There are practical defects in the metric system, in addition to those arising out of the theoretical inaccuracy of the mètre as a unit of measure. But as every useful thing and every pleasure in this world is proverbially accompanied by some blemish or drawback, it is not surprising to find that the metric system shares the common lot. Hence we are rather inclined to doubt the utility of the pamphlet, "Against the Metric System," published in pursuance of a codicil to the will of the late Herbert Spencer. This *brochure* is entirely in the nature of an *ex parte* statement, and its weight is considerably counterbalanced by the fact that among the opinions quoted are those expressed by Napoleon nearly a century ago, by Sir John Herschel more than forty years ago, and by others whose sympathies were, or are, naturally with the things of bygone days. At the present time the metric and the decimal systems are most extensively employed by foreign nations and are invaluable aids to scientific and commercial intercourse. In this country too the metric system is increasingly used in various departments of science and industry, and it is too late to raise academic discussion as to its defects. Its value is thoroughly recognised by those who desire to exchange thoughts or to barter goods with other nations of the world, and from recent official communications we find a very similar feeling exists in many important British possessions. By the compulsory adoption of the metric system at home an enormous amount of trouble and expense would doubtless be caused, but this could be minimised by judicious legislative treatment, and should be more than outweighed by the benefits that would certainly follow a departure from our present isolation, which is clearly disadvantageous for a country having mercantile and other relations in every part of the world.

London Bridge. AFTER a brief ceremony on Monday last, public traffic was completely resumed on London Bridge, the widening of which was commenced some two years ago. By the recent alteration the width between parapets has been increased from 55 ft. to 65 ft., but the whole of the additional width has been devoted to the footways, each of which is now 15 ft. wide instead of 9 ft. as heretofore. The original footways were certainly cramped for the traffic, but they are now as obviously wider than necessary, and it is perfectly evident that a much slighter and less drastic alteration to the exterior of the bridge would have sufficed to give the necessary width, without weighting the design, in an architectural sense, with such immense projecting corbels. What the effect on the appearance of the bridge is it is not easy to fully realise until the temporary footways outside the bridge are removed; but, as far as one can see from the riverside quay, our impression is that the appearance of Rennie's grand structure has been much and unnecessarily impaired.

Railway Brakes. AT the conclusion of his report upon the disastrous accident at St. Enoch Station, Glasgow, whereby sixteen men were killed and sixty-four injured, the Board of Trade Inspector once more calls attention to the fact that British railway rolling stock is still being fitted with the same patterns of brakes as were introduced twenty-five years ago. We have before called attention to the hopeless conservatism of railway companies, over whom in many directions there is practically no control. They seem to be averse on principle to all improvements that mean trouble and expense, and for this reason no doubt have steadfastly refused to adopt the newer and improved types of the vacuum and Westinghouse brakes that have been taken up in other countries. The improvements to which we refer insure greater rapidity of action, so that the distance or time within which a train may be stopped can be proportionately reduced. The desirability of employing the most recent types of brake apparatus is emphasised by the fact that the speed and weight of trains is continually on the increase. The brake fitted to the train which came to grief at Glasgow was of the vacuum type, and it is worthy of note that, although this is far less efficient than the Westinghouse brake, it is far more largely used than the latter. Careful analysis of the Board of Trade reports for several years past leads to the conclusion that, rejecting all faults due to inattention or neglect, the number of failures to stop a train when desired is in the ratio of twelve to one for the vacuum and Westinghouse brakes. Railway engineers and directors must know this, as well as they know that their brakes are a quarter of a century behind the times. They are, however, perfectly indifferent, and will probably remain so until strong pressure is put upon them to compel reforms.

Tramways on the Embankment. IT appears hopeless to expect that the present House of Commons will allow a tramway to be constructed over West-

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minster Bridge and along the Embankment. The opposition to this project in Parliament is purely social, and caused by a dislike of tramways in London. Public convenience and the needs of workers in London are considered to be of no account when there is a possibility that private carriages will not have the entire Embankment for their use. The argument used to defeat the project last week was childish—the tranquility of the gardens would be lessened, the roadway would be defaced by tramcars, and other so-called arguments which were paltry, foolish, and partly hypocritical. Fortunately the life of the present House of Commons is drawing to a close, and in the next the interests of the people of London will probably have more consideration.

Tramway Systems.

THE paper on tramway systems in cities, read by Mr. McCulloch at the annual meeting of the American Street Railway Association, is one that can be studied profitably by engineers in this country. In America the tramway systems in large cities are due to a process of evolution. As a rule the various companies, which ten years ago competed against one another and in some cases even built rails parallel to one another over long distances, are now amalgamated. The amalgamated companies own several power stations, and in most cases these are badly situated with respect to the tramway network, and in some cases they are equipped with antiquated machinery. The question has, therefore, arisen as to whether it would be better to equip the old stations with modern appliances or to build a central power station using the others merely for the distributing plant. The conclusion Mr. McCulloch arrives at is, that for cities of less than 250,000 inhabitants it is better to equip the old stations, but in large cities a single power station supplying small sub-stations at suitable spots would be more economical. He points out that, when a central power station supplying power by means of high pressure alternating currents is used, there are more links in the chain between the steam engines and the motors in the cars, and so the system is not quite so trustworthy as when direct currents only are used. In America no high-tension wires are connected with the switchboard. All the switching devices used in connexion with large currents at high pressures are worked by motors controlled from the switchboard. Each switch is built in a brick fire-proof compartment, and the switch contacts are separated in oil. Stress is laid on the importance of making power stations absolutely fire-proof, and having the various large steam engines or turbines, each of which is coupled to a dynamo, practically independent of one another, so that an accident like the bursting of a steam pipe or a flywheel would not be likely to cripple more than one of the combined power units.

The Sand Box.

UNTIL a few years ago scientists could not explain by what means the ancient Egyptians were enabled to deal with the heavy stone slabs covering the sarcophagi of bygone potentates. It is now known that the sand box, familiar to every bridge engineer, permitted the heaviest slab to be lowered into position with ease and safety. The covering stone was supported by masonry piers until the sarcophagus had been placed below it. Lugs on the slab, projecting into vertical recesses chased in the walls of the burial chamber, were then caused to rest upon vertical timbers supported below in holes filled with sand. The masonry piers were next removed, and by unclosing apertures previously cut in the sand-filled holes the supporting medium flowed slowly out, permitting the slab to settle gradually upon its final bearing. The most remarkable example of the sand box method was afforded during the recent transference of a swing bridge on the Lackawanna Railroad at Newark, U.S.A. This structure, consisting of a double-deck steel span, weighing about 1,700,000 lb., was lifted to a height of 20 in., transported for a distance of 35 ft., and finally lowered upon a new pier 10 ft. 6 in. lower than that on which it was formerly pivoted. This remarkable piece of engineering was performed by the aid of an enormous sand box plant, designed so as to obviate the delays inseparable from the use of cribwork and jacks. In many respects the plant may be said to present features of decided novelty, but the principle is really that employed in Egypt thousands of years ago.

Electrical Instruments.

THE paper on "Direct-reading Measuring Instruments for Switchboard Use," read by Messrs. Edgcumbe and Punga last week to the Institution of Electrical Engineers, will prove useful both to engineers in charge of central stations and to manufacturers. The former will learn the limits of the accuracy of their switchboard instruments, and the latter will receive many hints how causes of error, due to variation in temperature and the electro-magnetic action of the mains carrying the currents to the switchboard, can be eliminated. The authors point out how instruments which read correctly when set up in the testing-room may give most erroneous readings when put on a switchboard. Professor Ayrton stated that the authors had considerably understated rather than overstated the errors caused by the stray magnetic fields near switchboards. At the same time it is only right to point out that many practical instruments are entirely unaffected by magnetic errors. The modern type of Thomson-Houston meter, for example, is constructed with an astatic coil, so that it is practically unaffected by stray magnetic fields. The theory of the working of some of the instruments given by the authors and also some of the theoretical statements made in the discussion seem to us to be exceedingly primitive. The idea, for example, that the eddy current losses in the series coil of a Wattmeter could be made to compensate for the errors introduced by the induction of the shunt coil is entirely erroneous. Again, it was stated that the temperature error in the well-known induction-type of Watt-hour meter must be the same as the temperature error of the revolving aluminium disc. This would be most alarming, if it were true, considering the number of such instruments in use to measure the units consumed in private houses. It seems to us that the instruments made by manufacturers are sometimes triumphs of ingenuity and skill, but the theories advanced of their working leave much to be desired. We do not approve of the indiscriminate use of transformers in connexion with measuring instruments. Considering how very expensive many of these instruments are, and the great demand there is for them, we think that inventors might profitably study theory more thoroughly.

The Royal Surrey Theatre, Southwark.

THE devisees of the late Colonel Temple-West will offer for sale in the course of this month the freehold of the Royal Surrey Theatre, which was closed some days ago, and of the adjoining stabling in Obelisk-yard. The ground extends over an aggregate area of about 18,500 ft. super., having frontages to St. George's-circus and Blackfriars-road. The theatre, which, as lately reconstructed, has an auditorium containing upwards of 2,000 seats and a very large stage, was first erected by Charles Dibdin, the song-writer, and Charles Hughes, who opened it on November 7, 1782, under the name of the Royal Circus and Equestrian Philharmonic Academy, in rivalry of Astley's Royal Amphitheatre in Lambeth. Having been converted into a theatre, the Royal Circus was re-opened sixteen years afterwards, and then, after the fire of August 11-12, 1805, was rebuilt from plans and designs by Cabanel the younger, and opened as the Surrey Theatre on Easter Monday, 1806. Amongst the lessees were Elliston and Tom Dibdin, and there Buckstone made his first appearance on the stage. The playhouse was again consumed by a fire on January 30, 1865. In the autumn of 1902 Mr. Frank Matcham was appointed architect for some alterations and improvements of the building, which, however, suffered from fire in August of last year.

[Gloucester House, Piccadilly.

IT is stated that this house, which during many years had been the town residence of the late Duke of Cambridge, is placed in the market, and that it will probably give way to a block of residential flats. The house, standing at the corner, west of Park-lane, was at one time occupied by the Earl of Elgin, who there, in what Byron satirised as the

——"general mart
For all the mutilated blocks of art,"

first deposited the Elgin marbles. The marbles were afterwards removed to Burlington House, and finally, in 1816, to the British Museum. The mansion was subsequently purchased by the Duke of Gloucester, a grandson of Frederick Prince of Wales, on his marriage in 1816 with the Princess Mary, daughter of King George III.

The Modern Gallery.

AT the Modern Gallery there is a collection of landscapes by Mr. H. Forbes Witherby, under the title "At Home and Abroad." Those which are pure landscape, especially the English ones, are many of them very good; Nos. 2, 3, and 4, for instance

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representing respectively "Spring," "Autumn," and "Winter" in the New Forest country, are charming. Two scenes on the Hampshire moors, Nos. 20 and 30, are also fine landscapes. But Mr. Witherby should either avoid architectural subjects or pay more attention to truth in delineating them. In "The Thames from the Embankment" St. Paul's is so entirely travestied that we should hardly have known it was meant for St. Paul's but for its position in the view; and in No. 35, "The Remaining Bit of the Old Banks of the Tiber," the dome and lantern of St. Peter's are all wrong in proportion and outline. Some of the picturesque corners in the smaller canals of Venice (49, 57) are good in general effect, though even here the texture of stone is wanting. The best of the architectural subjects is the Ponte Vecchio at Florence (42). But in dealing with great architectural monuments like St. Peter's and St. Paul's, landscape painters ought to recognise that these are objects to be studied with care and represented with truth, and not sketched in anyhow.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE DESIGN AND CONSTRUCTION OF BUILDINGS CONNECTED WITH THE GENERATION AND SUPPLY OF ELECTRICITY KNOWN AS CENTRAL STATIONS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at the Rooms, 9, Conduit-street, when the chair was taken by the President, Mr. Aston Webb, R.A.

The minutes having been taken as read, Mr. C. Stanley Peach read a paper on "The Design and Construction of Buildings connected with the Generation and Supply of Electricity known as Central Stations," of which the following is an abstract:—

In his preliminary remarks the author emphasised the need for an architect to study the buildings required for modern scientific industries if he is to maintain the traditions of the past and take a prominent part in the progress of the day. The buildings connected with the generation and supply of electricity—commonly known as central stations—are a conspicuous example of such structures. In less than twenty years they have developed from small commonplace sheds to complex structures frequently of great size, occupying prominent sites, and supplying power for innumerable purposes. Upwards of 750 of these buildings have in about fifteen years been erected in the United Kingdom alone, and a much greater number abroad. The advantages of electricity were appreciated sooner abroad than in Great Britain—here, also, it was hampered for a time by unfortunate legislation—and the industry had made considerable progress in foreign countries before a start was made here. Hence it is useful to study foreign practice, for that which obtains abroad to-day is more or less that which will be put into practice in England to-morrow. The various systems of supply have been in a continuous state of evolution, and requirements have constantly changed. The buildings first erected have been quickly superseded, and information obtained from existing buildings is not so generally useful as it is in cases where slower progress on more settled lines has taken place. Now, however, matters are assuming more or less definite shape, and the time is opportune to consider buildings recently erected and those likely to be required in the immediate future.

Primarily central stations may be divided into three classes—viz:—

1. The Power Station—the class now coming into vogue and the real central station—at which power is generated for the district allotted to it, whence it is supplied to sub-stations for distribution. Larger and more powerful machines are usually installed in power stations.

2. The Sub-Station, which receives the power from the central source, and retails or distributes it to consumers in its immediate vicinity. There are two principal sub-divisions—(*a*) sub-stations housing machinery and batteries or accumulators for storing electricity; (*b*) sub-stations without storage and accommodating machinery only.

3. Direct Supply Stations (sub-divided into Simple and Composite), where the power is both generated and distributed. The Simple direct supply station comprises the machinery departments only. The Composite direct supply station is rather an electricity works, and contains, in addition to the rooms for machinery, accommodation for meters, mains and road-work, tramways and administration departments, sometimes also destructor, etc., but the accommodation varies considerably in every case.

The initial source of power—*i.e.*, wind, water, or steam—exercises the greatest influence on design and construction. The more directly the natural elements are employed, the fewer processes are involved and the more simple the building required.

The author treated at considerable length the building requirements, equipment, and arrangements of the various classes of power stations, describing more or less fully the principal stations in the United Kingdom, on the Continent, and in America. Working drawings and views of the buildings were shown by lantern slides, and a large number were displayed on the walls of the Meeting-room.

The simplest kind of station is that in which air or wind is the source of power. The only station of this kind, that at Askov, consists of a single room containing dynamos and accessory machinery. It has been running satisfactorily since its erection in 1902. The windmills are above the building and connected to a counter shaft, whence the dynamos are driven by belts.

A great number of water-power stations have been erected abroad, but there are none of first-class importance in Great Britain. It is usually a one-story building above the ground line, having one and occasionally two or more principal rooms. The flumes, aqueducts, weirs, and sluices required for diverting and controlling the water and directing it to the turbines, and for leading it back to its natural channels, the foundation of these buildings, honeycombed with chambers and tunnels, are the most interesting parts of the works. Their construction requires considerable technical skill, as almost every kind of vault, dome, and curved structure meeting and intersecting at every kind of angle is to be found in these buildings.

At Niagara, probably the best-known water-power station, the volume of water is estimated to represent 7,000,000 h.p., the greater part of which can, and eventually will, be made available. Thus a force equivalent to the consumption of over 200,000 tons of coal per day (practically the daily output of the world's coal-mines) will be penned in and controlled in the buildings. The machines dealing with this power must all be fixed rigidly in one place, and will be concentrated in a comparatively small area. This concentration and fixing of machinery of enormous power within a building is a new feature. The structure must be calculated with an ample margin of safety, and to allow considerable strength above what would be considered sufficient in ordinary practice.

Some of the European water-power stations are interesting examples of well-studied architectural treatment. Full advantage has been taken of the shape of the building required for the arrangement of plant. The most important members of the construction have been accentuated in the elevations, and the buildings have been carefully grouped to accord with the locality in which it has been necessary to erect them. A picturesque example is the power station at Tivoli, on the Tiber, where the energy for the city of Rome is generated.

The steam-power station, a comparatively recent introduction, is a more complicated building than the water-power station. Owing to the larger size of the rooms, the greater number of departments, and the more complicated construction required, these buildings present even greater opportunities to the architect. The author predicted a great demand for these in the future, for they are the direct outcome of the system of generation and supply which now seems in a fair way to receive general acceptance. Steam stations generally consist of engine-house, storage for electricity, boiler-house, pump-room, chimney-shafts, coal store, and water department. The station of the London Electric Supply Corporation at Deptford was perhaps the first of this kind, designed by Mr. Ferranti in 1888. Stations erected ten years later in America have followed very closely Mr. Ferranti's design. The special construction problem presented is the manner in which the heavy loads requiring to be accommodated in these buildings have to be disposed on the site. The Americans have displayed great ingenuity in installing very powerful plant on sites of small superficial area; stations with plant on more than one floor are more common there than elsewhere. A remarkable instance is the Edison station at Philadelphia, where the plant is installed in an eleven-story building, each department being placed on a different floor, one above the other. It is not, however, an arrangement which would be adopted in ordinary practice.

The Manhattan station, New York, is typical of central stations generally in one respect. It is built on a bad foundation, the gneiss bed rock bottom being deeply eroded by streams which formerly traversed it. It was therefore of unequal supporting power, which accounts for the apparently unequal strength and thickness of foundations. Large quantities of water are used in connexion with the work carried on in central stations, therefore they are frequently erected on the banks of rivers and canals, where the sub-soil is hardly suitable for such buildings and careful adjustment of the weight is necessary. Sometimes the subsoil is hard in places and yielding in others. In such cases foundations like those of Manhattan have been found suitable, but in very soft soils much water-logged it is as a rule better to support the load on concrete floats proportionate to the weight, allowing somewhat more than half the load which would be taken for an ordinary building. A thick float of concrete all over the site is a common method of meeting the difficulty, both in English and German practice. It is a good plan on clay, but should be keyed on the underside on looser soils.

Referring to the architectural treatment of some of the Continental stations, the author said that the buildings are faced externally with fine hard bricks, bright buff, laid in the German fashion, all headers. The gable ends are well treated with very large windows and strongly-marked divisions in the lights. The general wall-faces are plain, but the header bond gives an excellent scale to the buildings, and the ornament is concentrated in a few well-designed and well-placed features by which the full value of the expenditure on embellishment is obtained. It is often said of buildings treated like Geneva, Munich, and the Berlin stations that they are expensive. They are generally less costly than many buildings which look plain and are so described. The difference is that in the one case full value is obtained from the embellishments by good design, in the other case the same or greater expense is incurred for material not essential to construction frittered over the surface and therefore ineffective. Other notable buildings are the power station at Munich, with its interesting and original shaft, the whole forming a most picturesque group with the baths which adjoin it; the station at Turin, with elegant gable treatment and a circular brick shaft, well treated with pilasters and cornice at the top and plain brickwork below, partly water-power and partly steam, is an interesting example of Italian practice; at Vicenza, where a most ingenious arrangement of double arches and open tile-work is adopted for the windows.

Almost every combination and kind of plant and design of central station is to be found in Great Britain. One of the largest power houses in London will eventually be that of the Central Electric Supply Company at Grove-road, St. John's Wood, which will supply power for general purposes for the west-end districts of London served by the Westminster Electric Supply Corporation and St. James's and Pall Mall Electric Lighting Company. It is situated on the banks of the Regent's Canal, the site being 7½ acres in extent, all of which will eventually be covered with the buildings. Upwards of 150,000 h.p. can be placed on the site if the plant is arranged on the one-floor system. The one-half of the first section has recently been completed, and provides accommodation for 14,800 h.p.

The author gave details also of the power stations at Edinburgh, Glasgow, Manchester, Sunderland, Brighton, Eastbourne, Liverpool, Dublin, Chiswick, the City of London Power Station near Blackfriars Bridge, and others.

The simple direct supply station consists of

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the machinery departments somewhat on the same lines as the power station. It was almost the earliest form of station, and originated simultaneously with the composite form of direct supply station. It was required in those districts which were too large to be served by one central station, before the days of the power station. It is not probable that many more of these stations will be required. Some of the existing simple direct supply stations are already being converted into sub-stations, and in time, no doubt, the steam plant will be taken out of many and be replaced with electrical machinery only.

Of the composite type of direct supply stations though, in small towns, in the country remote from other towns or from centres where power can be generated under exceptionally favourable conditions, and in agricultural districts this type will be erected for some years to come; sooner or later combination between towns and districts will take place, and co-operative power stations will replace this class also, and those then existing will become at any rate partly sub-stations also. It will be a great advantage to this country in the keen war of trade competition which is before it, and will reduce the appalling extravagance and waste of the mineral wealth of this country which is now going on from the unnecessary consumption, carriage, and handling of coal, and all the attendant waste of land, labour, and time, and congestion of traffic produced and fostered by present methods.

Sub-stations to accommodate static transformers were formerly small, unimportant structures, frequently vaults under the pavement or roadways, or in basements of houses. It is now, however, a building requiring careful design and of daily increasing importance. The function of the plant installed in it is either to alter the character or to reduce the tension of energy derived from the power stations, and to distribute either the same energy at another potentiality or to generate and distribute new energy at low tension by means of dynamos directly coupled and driven by motors. Every precaution should be taken to prevent transmission of mechanical vibration or escape of sound beyond the building. The buildings must be dry, well ventilated, and well lighted in every part.

The author gave some interesting illustrations of the chimney-shafts of central power stations. These shafts are not ordinary factory chimneys. Their importance to the undertaking, and consequently to the community, their great size, and the fact that they may be erected in groups of from two up to six or more, require that they should be of better construction and appearance than is often deemed sufficient. Cast-iron caps are frequently objected to as being heavy; properly designed, they are lighter than a corresponding height of brickwork. Within reasonable limits a fairly heavy cap is an advantage and not a disadvantage.

The author concluded a summary of matters, which experience has shown are of importance in designing central stations, with the following remarks:—From the very commencement of electric supply engineers have been ceaselessly engaged in inventing, working out, and perfecting the innumerable electrical and mechanical devices and systems connected with this highly scientific subject. It has been, and it is, impossible for them to burden their minds or give up time to the consideration of the buildings. From the moment that the plant arrangement which the engineer requires has been given to the architect, the former never expects nor wishes to have anything more to do with the buildings until the architect is in a position to hand them over ready for the engineer's work to commence and plant to be erected. By this it is not to be understood that during this time the architect can work without reference to the engineer; quite the contrary. They must be in touch at every point from commencement to completion. The architect must be prepared to deal with the legal points affecting the buildings, their cost, and every part of the construction. He must appreciate what the industry is, what its developments are likely to be, and have the same intelligent general knowledge about machinery and things electrical that he would be expected to have of the fittings, appointments, and work of any other class of buildings more commonly met with in general practice.

Professor Kennedy said he was glad to see so large an attendance, for it was very much larger than was the case some twenty years ago, when he read a paper before the Institute. He was glad that the architectural profession was taking the matter up seriously, because these stations had to come, and if architects would not attend to them seriously, it would be very much the worse for the stations and for the public who had got to look at them. As Nature had not provided them with water power in this country he was afraid they were bound to put up chimneys, and if engineers designed the chimneys the consequences would be too terrible to think of. Therefore he hoped architects would, as, indeed, he knew they were doing, take up this matter in the manner that Mr. Peach had taken it up. There was only one fault he had to find with the paper, and it was a serious one, although characteristic of Mr. Peach. It was that Mr. Peach had made no reference to himself, although many of the stations shown were from Mr. Peach's own design. The stations of the Westminster Electric Supply Company and the St. James Company, the Central Electric Company, the County of London and Brush Company, and the beautiful station at Ipswich, and a number of others were from the designs of Mr. Peach. As to the relations between engineers and architects in connexion with work of this kind, he thought Mr. Peach had indicated what they should be in a satisfactory manner. The work of the two branches must be very close indeed, and he did not think either could get on without the other if a satisfactory result was to be obtained. In the case of the external appearance, of course they looked to architects to help them altogether, and that was important, because the more presentable buildings could be made the better for everyone concerned, and certainly in cities the more presentable they were the better would the financial results be. The question of vibration was a very serious one in any buildings which had to be erected in a town, and, therefore, the construction of the foundation should be such that there should be as little as possible transmission of vibration from inside the building to the outside, and it was one of the most important things the architect had to consider. Of course the architect was terribly at the mercy of the engineer in this matter, because the engineer had got to have foundations more or less of a particular shape, but in his experience he believed the most important point in the matter of getting non-vibrating foundations—apart from the fact that they should be separated from the foundations of the walls and so forth—was that they should, if possible, be in the shape of a flat tile put down flat ways, rather than in the shape of a brick set up on edge. In other words, they should be of a shape which offered as little chance of rocking on its own corners as possible. He knew that in one or two cases where there had been trouble the foundation had been made rather in the shape of a brick set on edge; very high and narrow, comparatively speaking; and the whole foundation rocked from corner to corner, and the vibration was transmitted across the street and into the neighbouring houses in a most uncomfortable manner. The plan which Mr. Peach adopted was to put down a concrete raft on which things in general stood, and lock with sand keys 10 ft. or 12 ft. square, sliding up in all directions. He could not say that this was the reason why they had had no trouble with several stations which Mr. Peach had designed, but certainly they had not had the trouble when the foundations were constructed in this fashion. Another matter of the very gravest importance which they were only now beginning to realise was that they must have no combustible materials about the building. They used to say that they had nothing in the building which would burn, but that was not quite good enough. Other buildings near might catch fire and set their stations on fire, and now he thought they had to ask architects to supply them with buildings which would have practically nothing about them which would burn. The construction of huge buildings in the county of London at any rate was certainly rendered more difficult and unpleasant by certain conditions of the Building Act, or interpretations of that Act, and he thought perhaps Mr. Peach would have spoken of that. He hoped in time some reforms would be introduced which would make it more easy to deal in a rational way with these enormous buildings, which fifteen or twenty years ago were never contemplated. Members of his profession would look to that paper as a most valuable and singularly complete discussion of matters which were of great importance to them all.

Mr. Eustace Balfour said he was an architect, the chairman of the St. James Electric Light Company, and also surveyor to the Grosvenor Estate, and as such had had knowledge of the work of Mr. Peach. He did not, however, speak now as an architect, but rather as one having knowledge of Mr. Peach's work in electric lighting concerns. The first point he would like to mention was that of water power. Some years ago he went into that question very carefully with Lord Kelvin, and asked him whether he could by any possibility use the Scottish loughs for water power. Lord Kelvin told him that he had gone into the figures completely and it was out of the question. Therefore, they might lay it down as a principle that, as far as water power was concerned in electricity, it was only in those cases where there were great rivers like Niagara or the Zambesi running permanently, or in such cases like the Swiss Rivers from the snow mountains and those in New Zealand and North Italy, that they could expect to use water power as a permanent source of energy. It meant that in New Zealand, North Italy, and in certain parts of South Africa the equivalent of coal existed in the snow mountains. That, however, was an engineering point. But they had to consider how architecture was to be dealt with when they got those stations, and Mr. Peach had shown how it could be dealt with. One of the chief problems they had to deal with was that of chimneys. Two or three months ago Lord Wemyss, who, he believed, was an hon. member of that Institute, came to his room and saw a photograph of one of the chimneys they had seen that evening, and he said that it was better than the Campanile of St. Mark's. He did honestly think that it was possible to design chimneys which would in themselves be beautiful, and he congratulated Mr. Peach on having been the first to deal with the situation and, whether successfully or not—and he thought successfully—tackling the most difficult problem there could be. With regard to the relations between architects and engineers, they were becoming more complicated day by day. They began in the days of railways, when the engineers thought they could design beautiful buildings, but when they came to consider they began to combine with architects. There, he thought, the Germans were a little ahead of them, for if they took Frankfort Railway Station, it was one of the most beautiful in Europe, and it was the combined work of architects and engineers. He thought engineers and architects ought to work together, so that one should supply the artistic side and the other the engineering side. With regard to vibration from electric light stations, they must clearly have legislation, for the present law was not sufficient. That, however, was perhaps a point rather outside the architectural side of the question.

Mr. John Slater said he had had some little experience in building electric light stations, but to nothing like the same extent as Mr. Peach, and, moreover, the stations for which he was responsible were in the early days of electric lighting, when they knew very much less about them than they did now. He would like to echo Professor Kennedy's remarks as to the extreme modesty of Mr. Peach, and he was sure they would support him in offering a hearty vote of thanks to Mr. Peach for the enormous trouble he had gone to. There was no doubt if they could have water power it would enormously simplify matters. He had been over a station at Friedberg, where the dynamos were driven entirely by water power, and could not help noticing the extreme cleanliness of the whole place. They could not get that in England, and were compelled to use coal, and certainly under those circumstances it was well not to have the stations in thickly-populated districts. The tendency of late with companies in London was to go further afield to get sites for stations which would not interfere with the amenities of the neighbourhood. Mr. Peach had told them of several companies which were going further afield, and the Kensington and Knightsbridge Company and the Notting Hill Company some years ago found the nuisance of being in a crowded neighbourhood so great that they combined to obtain a site at Shepherds Bush, where they were erecting a station very much on the lines of those which had been shown that night. The small distributing stations could, of course, be more easily brought into agreement with the surrounding houses and everything

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in the neighbourhood than could large stations. The question of vibration touched upon by Professor Kennedy was a very serious one, and if they had a central station in a crowded locality they were almost sure to get into trouble. He did not think engineers had yet quite got over the curious vagaries of vibration. He knew that at Notting Hill they put the engines down in a deep basement on the hardest London clay, and yet they found the vibration affected, not the immediately close houses, but those a street and a half off, and he believed that would be the experience of many others. Of course there were two kinds of vibrations which had to be dealt with. At Notting Hill they satisfied themselves that it was not earth vibrations but air vibrations.

Colonel Balfour seconded the vote of thanks.

Mr. Ferranti said he felt when the paper was being read that it did not give much scope for discussion but it was one most valuable to engineers, and also he should think to architects, as a record of what had been done in central station practise. To meet the wants of the present day—which wants were constantly growing in different ways—they could have nothing better than an accurate record of what had been done and how the matter really stood, and that they had in the admirable paper which had been read.

Mr. Watson said that the reader of the paper mentioned the difficulty of obviating expansion in the brick linings of the steel shafts and stated that architects ought to be very careful to design linings so that failure should not occur from expansion, but he did not enlighten them as to what means they should take to obviate the danger.

Mr. Wright asked if Mr. Peach would let them know his impressions as to the best means of dividing risks. Take the case of a boiler house. It was obviously very necessary to provide against the bursting of a steam pipe which would shut down the whole power house. That was an important point with regard to which Mr. Peach could help them.

Mr. Gay said that with regard to vibration, without taking any credit to himself, but giving it to the architect, Mr. Tiltman, in Islington, they had been absolutely free from any difficulty. The question of vibration was raised by him and considered most carefully by Mr. Tiltman, with the result that the whole of the foundations of the building were taken right away down below those of the engines and plant. The foundations of the engines themselves were made very wide at the bottom. They found that vibration was not transmitted to any extent beyond the foundations themselves. The most serious thing to deal with was not the transmission of vibration, for the only trouble he had had was not from the generating station, but from a couple of pumps, and this had now been obviated. A great deal of air vibration had been experienced. For a time they used to exhaust into the air and trouble arose. Subsequently they put the exhaust into the stack and had practically abolished the vibration altogether. Another difficulty which had arisen was the transmission of noise and sound vibrations, for the alternators seemed to have a peculiar property of directing themselves in different directions over a limited area. They could stand in the office and within a few inches they could get an intense vibration of noise or get out of range of it at once. It seemed to him that this trouble was the most important, but it was being got over, and he hoped they would be successful in completely dealing with it.

The Chairman said they were all glad to feel that so many of these buildings had fallen into the hands of one who had proved himself so able to meet the problems which were placed before him. They were also pleased that architects were taking up those buildings, and he could assure Professor Kennedy that eminent architects were very pleased to take up buildings when they were put into their hands. In these particular cases he felt that there were great architectural opportunities. They had the opportunity of great wall spaces, and of these, chimneys, which from their size became really great architectural features; and although he had never been fortunate enough to have to treat one himself, yet he felt they did offer great architectural opportunities to those who had them placed in their hands. It would also be a pleasure for the architect to work out a problem of this sort in conjunction with the engineer. It must, of course, be essential for the beginning that the architect and the engineer must work hand in hand and side by side. He did not know who would first begin—whether the engineer laid down the machinery and the architect built round it, or whether the architect suggested the building and the engineers suggested the size. At any rate, they must work side by side. For years engineers and architects had been working together, and many of the bridges throughout the Continent were the combined work of the two professions. It had fallen to the lot of the Institute from time to time to impress on local authorities, when they had a great engineering work, which was of such a position and character as to require architectural character, that they would probably obtain the best result by associating the two branches of the art together, to work it out between them. He happened the previous day to be passing the St. John's Wood station chimney, and although he would not say, like Lord Wemyss, that it reminded him of the Campanile of St. Mark's, still it was a very fine chimney. It looked like a chimney, and that was better than looking like the Campanile of St. Mark's. He thought Mr. Peach had given them some useful hints with regard to chimneys. It was not necessary to go to very great expense in the facing of them, for in London brick got black in no time and it was better to vary them by using some other material in the upper portion, and so get the effect which Mr. Peach had obtained at St. John's Wood. He should think these six chimneys in the air would be a very impressive monument, and no doubt the St. John's Wood people were looking forward to it. Whether they would add to the value of the property around it was not for him to say. But, seriously they had had a most interesting paper and they were to be congratulated on the fact that the first paper on this subject should have been read before the R.I.B.A. It would form a record which would be referred to from time to time when the matter came up. One other thing which struck him was the extreme rapidity with which these buildings were developed. They had been shown a station in connexion with the Central London Railway. It seemed to him only the other day that that railway was opened, and yet Mr. Peach said the station was old-fashioned, so that the development was evidently going on by leaps and bounds.

The motion was heartily agreed to.

Mr. Peach, in reply, said he wished to return his thanks to the engineers and others connected with the electrical industry in England, Europe, and America for the assistance they had given him. They could rely upon the facts he had given as being correct. With regard to vibration, that was a most important point in connexion with central stations. He had not touched upon it much because it was such a big question. So far as aerial vibration was concerned that could be practically overcome by two methods of carrying off the exhaust, but that was a matter which rested practically with engineers. So far as the transmission of mechanical vibration from the foundations was concerned they had studied this very carefully, and, broadly speaking, the way to overcome it was to put in large enough foundations. With regard to experience in the chimney linings the difficulty was not with the steel shaft, but in the case of brick shafts, where unless the lining was built between the courses tight, the moment the stack was heated the whole thing came down.

The Chairman announced that the next meeting would be held on Monday, April 18, when Mr. E. S. Prior would read a paper on "The Statues of Wells Front, with some Contemporary Foreign Examples of Sculpture."

LETTER FROM PARIS.

LAST Sunday, at Longchamp, the new tribunes or stands erected from the designs of M. Girault were inaugurated. These erections, built with white stone and iron, were commenced at the end of October, after the last of the autumn races. There are four of these very elegant structures, which will afford accommodation for many more spectators than could find place in the old brick and wood erections, which dated from the transformation of the Bois de Boulogne under the Second Empire. The state pavilion for the President and suite, standing above a series of terraces, is particularly satisfactory in its effect, and does great credit to the accomplished architect of the Petit Palais.

On April 16 the election of a successor to M. Corroyer at the Académie des Beaux-Arts will take place. The candidates named are M. Bouchot, curator of engravings at the Bibliothéque Nationale (who has the best chance of election), and Messrs. Camille Bellaigue, Mounet-Sully, Gonse, Albert Soubies, De Lassus, and Docteur Richet.

The works for the approach to the central station of the Metropolitan railway, on the Place de l'Opéra, have been commenced. A monumental staircase, twelve mètres wide, will occupy the portion of the site along the Boulevard des Capucines, on the principal axis of the theatre. This staircase will lead to a great hall, at the end of which two other staircases will descend to the platforms. At this point lifts will form the communications between the three super-posed railways. The portion exterior to the station will be reduced to merely what is strictly necessary, consisting only of very simply-designed balustrades, and the absurd erections in "l'Art Nouveau" style which have disfigured other approaches to the underground railway system are not to be repeated here, where, indeed, they would have made a singularly unhappy contrast to Garnier's architecture of the Opera House. On the lines themselves the work is being rapidly pushed forward, so that it is expected that the line from Courcelles to Ménilmontant will be opened to the public in September. The work executed at twelve and eighteen mètres below the surface for the line going from the Palais Royal to the Place du Danube (XIXth arrondissement) is also being continued, as also for the line from the Opera to the railway station at Auteuil.

The Roman remains discovered on the Montagne Sainte-Géneviève appear to indicate the site of a very important building, probably a palace which has been destroyed by fire, since there is a quantity of carbonised matter discovered. The foundations discovered extend up to the buildings of the Collége de France, where new excavations have been undertaken under the direction of M. Sellier, assistant curator of the Carnavalet Museum.

The Société des Amis du Louvre have acquired, and intend to offer to the museum, two fine sculptured Romanesque columns dating from the XIIth century, which came from the Abbey of Coulomes, now destroyed. These two columns, the capitals of which represent the story of the Magi, while the shafts are decorated with fantastic animals, are in a style somewhat similar to that of the sculpture of the principal doorway at Chartres.

The Department of Assistance Publique of Paris is about to commence some important works in connexion with the Paris hospitals. The old Hôpital de la Pitié, built under Louis XIII., will shortly give place to a new building supplied with every improvement that modern hygienic science can devise. The Hôpital Saint Louis, built under Henri IV., is also to be almost entirely rebuilt, as well as the Hôpital Cochin, founded in 1779.

It is also proposed to rebuild, on its present site, the Mairie of the XVIIth arrondissement, built from the designs of Lequeux before the addition of the Commune of Batignolles, and which is now very inadequate for one of the most densely-populated districts of Paris. The new building will be the subject of a competition, of which the programme is now being drawn up in the Service d'Architecture of the Municipal Council.

THE "BONES" OF ROMAN LONDON.

IN the course of the visit paid to the Guildhall last Saturday by the London and Middlesex Archæological Society attention was drawn to some extremely interesting architectural and sculptured stones lying in a rather neglected condition, and exposed to the weather, between the Guildhall Museum and the Guildhall proper. Many of these stones bear sculpture of a high degree of merit, and, in view of the wholesale destruction which has deprived us of similar fragments met with during excavations from time to time, it seems highly desirable that these should be rescued from their present hiding-place and be made accessible to those members of the public who are interested in subjects of this kind.

These stones are, as Mr. St. John Hope felicitously expressed it, the very "bones" of Roman London. They deserve the most reverent care, and for true archæological purposes are of far more value than half of the Roman pottery and miscellaneous antiquities

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with which the limited space of the Guildhall Museum is at present crowded.

The fragments, for such unfortunately they all are, were found many years ago during certain excavations in Camomile-street, and are known to have been fragments used up in the construction of one of the bastions of the wall of London. Whether that bastion was a part of the original Roman wall, and, indeed, whether it was constructed during the sway of the Romans, are questions which do not affect the archæological value of the sculptures. Authorities differ as to the relative dates of the wall and the bastions, but the fact remains that buried in the Camomile-street bastion were many most important examples of the art of the Romano-British sculptor and builder.

A respectful but vigorous appeal was made by the members present that these relics of a period about which we know so little should be transferred to a place of safety, where they will be protected from harm and be available for students. The sculptured stones belong to what is perhaps the least understood phase of our British art. They teach us exactly those facts about the influence of Roman art upon Celtic art upon which it is most desirable that we should have precise information; they tell of a period which is particularly dark as far as historical records go; and we cannot believe that the authorities of the Guildhall Museum will allow them to remain longer in a situation where they must suffer something from the weather and where they will soon be forgotten.

CARPENTERS' HALL LECTURES:

DEVELOPMENT OF METHODS OF LOCOMOTION.

THE last of the spring course of lectures connected with building matters, given under the direction of the Carpenters' Company at Carpenters' Hall, was delivered on Thursday evening last week by Mr. Basil Mott, M.Inst.C.E., on "Development of Methods of Locomotion." Professor W. A. Tilden, F.R.S., presided.

In the course of his lecture—which was illustrated by lantern photographs—Mr. Mott said the question of locomotion had become an increasingly important one, and it was difficult to realise how our ancestors, with their limited appliances, succeeded in carrying out the great events which formed the history of the past. The real development of locomotion had taken place within a comparatively short period of time, and now that there was a Royal Commission sitting to consider what can be done to remedy the terribly congested state of traffic in London, it was not without interest to trace some of the various stages through which our means of locomotion had passed until they had reached the present state of entanglement which a Royal Commission was trying to unravel. The earliest means of locomotion was walking, and there was little doubt that the first effort to carry out the desire for increased speed was successful when our ancestors captured animals fleeter than themselves and learned to ride. Next came the primitive sleigh which was found depicted in sculptures and paintings on temple walls built about 4,000 years ago. It was from them that practically all their knowledge of ancient types of vehicles was gathered. The next step was some primitive form of wheel, and it was interesting to note that although the wheel had played such an important part in transit development the date of its first use was amongst the mysteries of the past. In a series of slides Mr. Mott gave illustrations of Egyptian, Greek, and Roman chariots, and, passing to England, traced the development of carriage building and of the earlier forms of wagons used for transit purposes. One curious example was a coach of 1750, built with eight wheels. The first omnibus was introduced into London in 1829, and it ran from Lisson-grove to the Bank and carried twenty-two passengers inside. In 1849 the size of the omnibus was reduced and outside seats were added, and gradual modifications resulted in the modern omnibus, which, although perhaps not a thing of beauty, yet was the lightest and strongest vehicle in the world for the particular purpose it was intended to serve, and one of the handiest for getting through the traffic. Although thousands of years had passed since the construction of the first chariot, yet it was only within the last 150 years that methods of transit had developed far beyond anything accomplished during the previous centuries. In 1680 Sir Isaac Newton certainly prophesied that the day would come when they would travel fifty miles an hour, and the philosopher sketched out a locomotive to be propelled by steam to run upon the road. There was a fire and a boiler in the proposed vehicle, and it was proposed to move it by allowing the steam to shoot out from a pipe at the back, in this way pressing against the air—there was no record as to whether that was ever attempted. The first steam coach appeared to have been built by a French engineer, Cugnot, and the first English steam coach was that of Wm. Murdock in 1781. The year 1803 was an epoch, for it was in that year that Trevithick ran the first steam coach on rails. The first engine commercially successful was that of Blenkinsopp, in 1811, which was worked on a racked rail with gearing, and was used for haulage purposes in collieries. It was, however, Hedley's "Puffing Billy," rebuilt in 1815, which was the first engine that ran on smooth rails, and in connexion with this engine it might be said that the bogey in locomotion was introduced. In 1825 the first railway was opened from Stockton to Darlington, and railways began to make rapid progress, but it was the "Rocket," built by Geo. Stephenson, which really settled the supremacy of steam railways over all other forms of locomotion. Since that day great advances had been made in the construction of railway engines, but he was inclined to think that England still led the world in this direction. Mr. Mott described at some length the modern engines in use—taking those of the Great Western Railway as a type—and he also pointed out how the railway was in connexion with its branch lines developing the steam motor-car in a most successful way. With regard to electricity, it might be said that its real application for driving purposes had taken place within the last fifteen or twenty years, and in England there was no doubt that its development had been greatly hampered by municipal and other regulations. Now at last they appeared to be waking up. The first great advance was made by Siemens in Berlin in 1879, and the principle adopted by Siemens remained at the present day as the basis of all electric railways. In 1883 an electric light railway was opened at Portrush, but the first actual electric railway was the City and South London, opened in 1890. The motor-car principle adopted by the Central London Railway would probably be carried out by the majority of railways in the future. In Germany a speed of 135 miles an hour had been obtained, and the only limit of speed with electricity appeared to be defined by the condition of the permanent way and the cost they were prepared to go to in building the motor. What was before them it was impossible to say. Electricity was undoubtedly the traction power of the future, and already the large railway companies were electrifying suburban lines and electric tramways were developing by leaps and bounds. Where their ancestors toiled wearily in their stage coaches our children's children would, he hoped, be able to live in York and come every morning to London with a regularity and comfort and probably in less time than it took those of them who were unfortunate enough to live in South London to reach their offices on a foggy morning.

On the motion of the Chairman, a vote of thanks was passed to the lecturer.

Mr. Percy Preston (Master of the Carpenters' Company), in proposing a vote of thanks to the Chairman, expressed the pleasure it had given the Company to see such large attendances at the course of lectures. They were glad of this because it showed that the lectures were appreciated by the public at large.

THE INCORPORATED INSTITUTE OF BRITISH DECORATORS.

THE annual dinner of the Incorporated Institute of British Decorators was held on Monday, at "The Trocadero," Shaftesbury-avenue, Mr. J. D. Crace, President, in the chair. There were also present among others Messrs. J. Higson, J.P., President of the National Association of Master House Painters of England and Wales; R. G. Anderson, of the National Association of Scotland; J. Sibthorpe, of the Irish Association, W. H. Pitman, C.C., G. Haite, F. S. Murray, W. G. Sutherland, M. C. Cowtan, J. C. M. Vaughan, and F. W. Englefield, secretary.

The loyal toasts having been honoured,

Mr. W. H. Pitman proposed the toast of "The Incorporated Institute of British Decorators," coupled with the name of Mr. J. D. Crace. The Institute, he said, was only five years old, but it had endeavoured to live up to the ideal formed at its beginning. The staunchest supporters of the Institute came from the north of England and from Scotland and Ireland, and it was very difficult to make people in this great city take an interest in what the Institute was doing. The Institute was anxious to get more London members, and perhaps the reason why the London membership was not larger was because the rules admitted only those who were engaged in business and were direct employers of labour. The great ambition of the Institute was to allow members to enter only by examination, and to assist in the training of workmen and to grant them certificates of their competency. The great object was to improve the level of work.

The Chairman, in response, said that the progress of the Institute was steady, and, he hoped, was likely to improve. With between 400 and 500 members in various parts of the kingdom, they might consider the progress good so far. It was sometimes difficult to put into words the reasons for the existence of such a society, but the reason was given more than 2,000 years ago by a Greek dramatist, who said that "social intercourse was the teacher of all things to mortals," and it was the social intercourse—the bringing of men together who were engaged in the same craft and with the same interests, and in order that they might discuss as to how those interests could be promoted, and how the whole standing of their craft might be raised—that the good of such a society was seen. There were many points of view from which an Institute of the kind was valuable to the calling or profession it represented, and there were a good many other societies and institutes representing other professions which had had slow beginnings, and then had grown rapidly and had become important factors in the progress of the professions they represented. The Institute was working on narrow ground because of its limited membership, and for that reason they should not attempt at present what other societies were doing or had done. He had come to the conclusion that it would be necessary to make some alteration in their articles, so as to admit into their ranks some of those who were concerned in the very charming work of decoration that was now being carried out by large firms. It had come about that the execution of a great deal of important work of decorators had fallen into the hands of what he might call commercial firms, but those firms could not possibly undertake the work they did were it not for the gentlemen of artistic talents who carried out their work, and he hoped that before long the Institute would be able to welcome such gentlemen.

The Chairman then proposed "The National Association of Master House Painters of England, Scotland and Ireland," and in the course of his remarks he expressed his gratitude to the Association for having recently made him a life member. The National Association had for its aim the proper and sensible object of promoting all that could assist and enlarge the usefulness and commercial prosperity of its members. It was what one might call—speaking in the best sense—the commercial side of the calling of decorators, whereas the Institute was rather on the artistic and professional side, so to speak, and existed to raise the intellectual level of the calling generally. The Association had reached a state of prosperity which could not have been anticipated when it was started. The membership was over 2,000, and that was a remarkable result after about ten years of existence. With the toast he coupled the names of Messrs. Higson, Anderson, and Sibthorpe, all of whom responded.

Mr. Higson, who responded for the English and Welsh Association, said he thought the Association had already done a great amount of good. They had a lot of energy, but they regretted that they had not more London members. Men who joined the Association with the thought of enriching themselves made a great mistake; a man was amply repaid in joining the Association by meeting the men he did. The Association was endeavouring to raise 500*l.* or 600*l.* for the purpose of developing their School of Painting. They already had ten pupils in the school, and they hoped to have more. The Association believed more in educational work than in putting money to its credit. They had inaugurated an international scholarship, which was subscribed to by the

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three branches of the Association. They hoped to make men think more of their trade.

The Chairman mentioned that Mr. Sibthorpe had organised another visit to Italy of those interested in colour decoration.

Mr. Sibthorpe said that the last visit had been a very delightful one, and a large amount of good work was done by the party in the fortnight they were away.

The Chairman then proposed the toast of "The Visitors," coupled with the names of Messrs. Haite and Murray.

Mr. Haite said he believed the Institute had a great future before it.

Mr. Murray said he had thought that in the last ten years decorative painting was dead, but he was glad to find that that was not at all the fact. There was still some backbone left in decorative painting. Unfortunately he had been Associated too much in the past few years with what might be called the fashions in decorative art, and the fashion in art had been to forget the lessons of our forefathers and ancestors, and to paint everything white. White was the refuge of the incompetent. He was glad to think that something more was going to be done in paint.

The proceedings then terminated.

On Tuesday the annual meeting of the Institute was held at Painters' Hall, Little Trinity-lane, E.C.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Camberwell Borough Council 1,600*l.* for pipe sewer reconstruction works; Fulham Borough Council, 4,500*l.* for river wall; School Board for London, 250,000*l.* for new schools, etc.; and West London School District managers, 5,000*l.* for erection of schoolrooms. Sanction was also given to Hampstead Borough Council to borrow 1,300*l.* for purchase of land for housing purposes, and to Lambeth Borough Council to borrow 7,786*l.* for paving works.

Piccadilly Widening.—On the recommendation of the Improvements Committee it was agreed that the estimate of 70,000*l.* submitted by the Finance Committee be approved; and that, subject to an agreement being entered into between the Council and the P. and R. Syndicate, and subject to the syndicate giving the security provided by the agreement, the Improvements Committee do arrange with the Council of the City of Westminster for the acquisition by it on behalf of the Council, under Michael Angelo Taylor's Act, in connexion with the widening of Piccadilly near the Circus, sanctioned by the Council on July 28, 1903, of the leasehold and trade interests in Nos. 19, 20, 29, 30, and 32A, Piccadilly, and Nos. 3 and 5, Air-street.

Charing-cross, Euston, and Hampstead Railway Bill.—The Parliamentary Committee recommended, and it was agreed, that petitions be sealed and presented, if necessary, in the House of Lords in order to secure further amendments (*a*) in the Baker-street and Waterloo Railway Bill and (*b*) in the Charing-cross, Euston, and Hampstead Railway Bill.

Inspection of Cornices, Copings, and Parapets of Buildings.—The Building Act Committee reported as follows:—

"On January 14, 1904, part of the parapet and cornice of the main portion of the premises Nos. 214 to 220, Westbourne-grove, Kensington, fell through the roof of the projecting shop portion, killing one of the assistants and injuring several others. An examination of the remaining portion of the parapet showed that the accident was due to defective construction of the brickwork, the pressure of the wind, and the weight of the projecting cornice. The brickwork of the parapets of the adjoining houses was also found to be decayed and cracked and bulging outwards. In view of the serious nature of this accident and of others that have occurred, we thought it desirable to send a circular letter to district surveyors calling their attention to the necessity of the cornices, copings, and parapets of buildings being kept under careful observation. It has since been pointed out that in districts where there is a great number of old houses it will, in many cases, be necessary to serve notices to repair; and it is asked that, in order to prevent complaints by owners of property as to the action of the district surveyors, publicity may be given to the fact they are acting under instructions from the Council. We are of opinion that a useful purpose would be served by public attention being drawn to the danger caused by defective cornices, parapets, and copings, and to the fact that these portions of buildings are, on account of their exposed position, more liable than other portions to be injuriously affected by the weather, and consequently should be more frequently inspected and repaired. We have accordingly asked the Metropolitan Borough Councils to give publicity to the action taken by us in the matter. We report the facts for the information of the Council."

Holborn to Strand—Letting of Land.—The Corporate Property, Charities, and Endowments Committee reported as follows:—

"We have had before us an offer of 400*l.* per annum made on behalf of Messrs. Sykes and Sons for a lease of lot 7, Kingsway, they at the same time undertaking to set back the vaults to their adjoining premises as required for the Council's works. The plot has an area of about 2,425 ft., with frontages of about 74 ft. to Kingsway and 22 ft. to Parker-street, and was submitted to auction in October last. The conditions attaching to this offer are that the Council shall at its own cost build the retaining wall of the vaults of Messrs. Sykes's adjoining premises and provide an eye to the sewer, and also will grant permission for an access from Craven House, the adjoining premises, to the new building proposed to be erected.

"The rent offered represents, in our opinion, the value of the land, and, having regard to the fact that, should it be accepted, payment of compensation to Messrs. Sykes in respect of the curtailment of the vaults to the adjoining premises would be avoided, we recommend:—That, subject to the result of the usual inquiries proving satisfactory, lot 7, Kingsway, be let, on the Council's usual conditions and with the additions stated in the report of the Corporate Property Committee, dated March 21, 1904, to Messrs. Sykes and Sons, for a term of eighty years at a ground rent of 400*l.* per annum; that the solicitor do complete the matter; and that the seal of the Council be affixed to any necessary documents (when ready) in connexion therewith."

Mr. E. White said he felt that the recommendation was very disappointing, as the price only worked out at 3s. 2d. per foot, and that appeared to him to be a very inadequate sum for such an important neighbourhood. He should have thought 5s. per foot would have been a fair price, and he was forced to the conclusion that the reason for the small price obtained was on account of the Council's onerous conditions.

Mr. Howell Williams said the feeling of builders and architects was that if they wanted to go in for worry they should take a site from the Council. He thought the Council should set a good example as a ground landlord, and not a bad example.

Mr. Lewis appealed to the Council to treat their tenants in a reasonable manner.

Mr. Sydney Low said that their land was offered at a public auction and they did not get a bid, and the opinion he came to was that the Council's conditions were too onerous. The Council gave such authoritative powers to the architect that no builder would take up the land unless he got very favourable pecuniary conditions.

Mr. Goodman moved that the report be referred to the Improvements Committee for consideration and further report.

Mr. Hunt seconded the Amendment.

Mr. Burns said that the fact was that land was not in the same demand in the neighbourhood as was the case five or six years ago. With regard to the conditions, the architect had the right to protect posterity from bad buildings.

Mr. Alliston considered that if the Council held its hand they would get a better price.

Mr. Mullins pointed out that in this particular case the site was no ordinary one. It was dominated by ancient lights, and only the owners of the adjoining property, who proposed now to lease the site, could properly develop it.

The Amendment was carried on a show of hands.

Thames Barrage Scheme.—Mr. Goodman, in reply to Mr. Beachcroft, said he knew of no Thames barrage scheme, except such as had appeared in the newspapers. When, however, a barrage scheme was officially brought forward by any responsible body, the Main Drainage Committee would inquire very carefully into it, and make a report to the Council.

Housing.—Mr. Bruce moved the adoption of the report of the Housing Committee, and pointed out that during the year ending April 1, 1903, the Council had housed 4,839 persons at a cost of 243,578*l.* There was also a great deal of work progressing rapidly, which, when completed, would house 17,174 persons.

Mr. Beachcroft said the parargaph in the report dealing with the retention by the Council of dwellings erected by them under Part I. was an important matter. It was the first time that the Committee had brought up a report on the matter. While the Council had got permission to retain the buildings erected by them during 1904 and 1905, yet it left the question open, and in three or four years' time, unless they had a friendly Secretary of State, they might have to put up the whole of the Boundary-street property for sale.

The report was adopted.

A discussion took place on a recommendation of the Improvements Committee to rescind the resolution of the Council fixing at 1,560*l.* the housing value of the site in Wandsworth-road, proposed to be utilised for rehousing purposes in connexion with the Nine Elms-lane improvement, and to fix the housing value at 739*l.*

Lord Welby considered it was a wrong principle for a Committee to alter the value without first reporting to the Finance Committee.

The recommendation was agreed to.

New Lyceum Theatre.—The Theatres and Music Halls Committee reported that they had considered plans, submitted by Mr. B. Crewe, on behalf of "Lyceum (1903), Limited," showing how it was proposed to reconstruct the Lyceum Theatre in conformity with the regulations of the Council. The proposed theatre was shown to accommodate a seated audience of 2,800 persons, and the committee understood that it was intended to use the premises as a music-hall, in which two performances would be given nightly. The Committee were of opinion that standing should not be allowed in any of the gangways, and it was only on this understanding that they could consider the premises to be reasonably safe for the admission of the public. Subject to this and certain minor modifications the Committee recommended that the plans be approved.

This was agreed to.

Proposed Theatre at the Corner of Aldwych and Drury-lane.—The same Committee stated that they had considered plans submitted by Mr. W.G. R. Sprague on behalf of Mr. Murray Carson, of a theatre to be erected on this site. The premises were shown to accommodate seated an audience of 1,120, and the Committee were of opinion that standing room in the gangways should not be allowed. On this condition and others the plans were agreed to.

The Works Committee.—Mr. Taylor asked the Chairman of the Works Committee if he was aware of the dissatisfaction which existed with regard to the introduction of the bonus system into the Works Department.

Mr. Torrance replied that there had been complaints before the Committee, but he would bring the matter up for consideration.

Appointment.—Mr. A. Graham Drury was appointed assistant resident engineer during the construction of Rotherhithe Tunnel.

Tramways.—The following recommendations of the Highways Committee was agreed to:—

"That the estimates of 6,650*l.* and 350*l.* submitted by the Finance Committee be approved; that the Highways Committee be authorised to expend sums not exceeding 7,000*l.* in all, for the provision of a temporary electricity generating-station at Bankside, and the purchase of the requisite plant and electrical equipment for such station."

The Council adjourned till April 26.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

St. Pancras, North.—The retention of a shed and a stack of scaffold poles on a site on the west side of Highgate-road, St. Pancras, in front of the Grove (Mr. A. W. Armstrong).—Consent.

Marylebone, East.—Permission to retain a bicycle shed on the forecourt of No. 85, Park-road, St. Marylebone (Messrs. Kirby, Millett, and Ayscough for Miss F. E. Freeborne).—Consent.

Clapham.—Four houses on the north-east side of St. James's-road, Wandsworth, between Wandsworth-common and Balham-park-road (Mr. T. W. Haylock).—Consent.

Greenwich.—An addition to "St. Kilda," Vanbrugh-park, Blackheath, to abut upon Vanbrugh-park-road West (Messrs. J. D. and B. M. Hooper).—Consent.

Marylebone, East.—Stone balconies at the first floor level of buildings on the site of Nos. 22, 24, 26, and 28, Langham-street, St. Marylebone (Messrs. Bird and Walters for Messrs. J. A. Michell and G. Watson).—Consent.

Marylebone, West.—Rebuilding of Nos. 376, 378, 380, 382, and 384, Oxford-street, St. Marylebone, between Bird-street and James-street (Messrs. A. E. Hughes and Son for Mr. D. C. Apperly).—Consent.

Fulham.—The retention of wood and glass enclosures over bay windows at "Johnsons-mansions" and "Yarrell-mansions," Queen's Club-gardens, West Kensington (Mr. G. Tolley for the Queen's Club Gardens Estates, Limited).—Consent.

Hampstead.—The retention of a projecting addition to the stable adjoining No. 49, Mares-

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field-gardens, Hampstead (Mr. J. E. Withers).—Consent.

Holborn.—The erection of an iron and glass shelter in front of the main entrance to the Hotel Russell, Russell-square, Holborn (Messrs. J. W. Singer and Sons, Limited, for the Fredericks Hotel Company).—Consent.

Kensington, South.—A wooden signboard on the forecourt of No. 144, Fulham-road, Kensington (Mr. F. E. Williams for Messrs. Stocken and Storey).—Consent.

Lewisham.—Porches to four houses on the east side of Baring-road, Grove-park, Lewisham (Messrs. Kennard Bros.).—Consent.

Lewisham.—Tiled pents to four semi-detached houses on the west side of Silverdale, Sydenham (Mr. C. W. Moat).—Consent.

Norwood.—Pents to twelve houses on the south-west side of Frankfurt-road, Herne-hill (Mr. H. Harrison).—Consent.

Paddington, North.—A gateway and shelter at the entrance to a passage-way leading to St. David's Welsh Church, St. Mary's-terrace, Paddington, between No. 22 and "Alexandra House" (Mr. J. Cassé for Mr. H. P. Edwards).—Consent.

Peckham.—A porch at "Waveney Lodge," Waveney-avenue, Peckham-rye (Mr. F. G. Grierson for Mrs. E. B. Gee).—Consent.

Strand.—A projecting sign in front of "Craven House," Northumberland-avenue, Strand (Messrs. Yates, Haywood, and Co. for Messrs. Simon Bros. and Co.).—Consent.

Wandsworth.—Projecting stone pilasters in front of Nos. 9, 11, 13, and 15, High-street, Putney (Mr. A. E. Chasemore).—Consent.

Wandsworth.—One-story shops upon part of the forecourts of Nos. 6, 7, 8, and 9, Replingham-road, Southfields, Wandsworth (Mr. C. G. Spagnoletti).—Consent.

Strand.—An iron and glass shelter at the entrance to the Café Royal, No. 68, Regent-street (Mr. W. Woodward for Madame Celestine Nicols).—Refused.

Lewisham.—A one-story building and covered way at the rear of No. 94, Brownhill-road, Lewisham, to abut upon Laleham-road (Mr. H. L. Upham for Dr. G. P. Y. Hulbert).—Refused.

Marylebone, West.—A projecting shop front at the first floor level in front of No. 400, Oxford-street, St. Marylebone (Mr. R. H. Kerr for Mr. Harbour).—Refused.

St. George, Hanover-square.—Oriel windows to No. 33, Dover-street, to abut upon Berkeley-street, Piccadilly (Mr. J. S. Gibson for The Mexborough House, Ltd.).—Refused.

Stepney.—A projecting illuminated sign in front of No. 196, Whitechapel-road, Whitechapel (Messrs. Young and Marten, Ltd.).—Refused.

Width of Way.

Islington, East.—A school building for the physically defective on the eastern side of Hornsey-road, Islington (Mr. T. J. Bailey for the School Board for London).—Consent.

Lewisham.—A deviation from the plan approved on April 24, 1894, for the erection of an extension of premises on the east side of High-street, Lewisham, abutting upon Granville-road, so far as relates to an increase in the height of such extension (Messrs. J. D. Mathews and Son for Messrs. Chiesman Bros.).—Consent.

Lewisham.—That the request of Messrs. C. L. Cassin and Co. on behalf of Mr. A. Blacker for permission to retain a fence at the African Banks Cricket Club Ground, Elm-lane (late Sabin's-lane), Catford, at less than the prescribed distance from the centre of the roadway of the street be acceded to.—Agreed.

Wandsworth.—That the Council do not accede to the request of Mr. T. J. Bailey for the School Board for London, for permission to retain four gate piers at the entrances to the school on the south side of Ensham-street, Tooting.—Agreed.

Width of Way and Lines of Frontage.

Woolwich.—The erection of an iron and glass shelter over Myrtle-alley, Woolwich, between No. 10 and No. 12, Hare-street (Messrs. Church, Quick, and Whincop for Mr. G. H. Leavey).—Refused.

Space at Rear.

Paddington, South.—A modification of the provisions of section 42 with regard to open spaces about buildings so far as relates to the proposed erection of an addition at the rear of No. 114, Westbourne-grove, Paddington (Mr. G. A. Sexton).—Consent.

Poplar.—A modification of the provisions of section 41 with regard to open spaces about buildings so far as relates to the proposed erection of a building on the east side of Prestons-road, Poplar (Mr. J. W. Kelly).—Consent.

Width of Way and Space at Rear.

Fulham.—An addition to buildings on the south side of Effie-road and east side of Effie-place, Fulham (Mr. G. Estall for the Metropolitan District Railway).—Consent.

Means of Escape at Top of High Buildings.

Lambeth, North.—Means of escape in case of fire proposed to be provided in pursuance of section 63 on the sixth story of a proposed nurses' home at St. Thomas's Hospital, Lambeth (Mr. P. Currey).—Consent.

Cubical Extent.

Paddington, South.—The erection on the site of Wellington-mews East, Norfolk-road, Westbourne-grove, Paddington, of a building to exceed in extent 250,000 cubic ft. (Mr. A. M. Ridge for Messrs. Wm. Whiteley, Ltd.).—Refused.

Formation of Streets.

Battersea.—That an order be issued to Mr. W. A. Large sanctioning the formation or laying out of two new streets at the rear of proposed buildings on the east side of St. John's-road, Battersea, between Battersea-rise and Beauchamp-road (for Messrs. Jones Bros.).—Agreed.

Fulham.—A deviation from the plan, section, and particulars sanctioned for the formation of a new street for carriage traffic, to lead from Farm-lane to Halford-road, Fulham, so far as relates to an alteration in the levels of such new street (Messrs. Pullen and Nixey).—Consent.

Fulham.—The retention of fences at each end of the new street to lead from Farm-lane to Halford-road, Fulham (Mr. W. Cane).—Consent.

Lewisham. †—That an order be issued to Mr. W. Burrell sanctioning the formation or laying out of a new street for carriage traffic to lead from Perry-hill to Castlands-road, Lewisham (for Mr. Leech).—Agreed.

Hammersmith. †—That an order be issued to Mr. J. H. Richardson refusing to sanction the formation or laying out of new streets for carriage traffic leading out of Heath-place, Uxbridge-road, Hammersmith (Messrs. Griggs Brothers).—Agreed.

Width of Way and Working-class Dwellings.

Finsbury, East. — Blocks of intended dwelling-houses on a site abutting upon George-yard, Old-street, Finsbury (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

Finsbury, East.—A block of dwelling-houses on a site abutting upon George-yard, Old-street, Finsbury (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The last meeting of the session of the Leeds and Yorkshire Architectural Society was held on the 24th ult., Mr. Butler Wilson presiding. The officers elected for the ensuing year were:—President, Mr. G. Bertram Bulmer; vice-presidents, Messrs. H. S. Chorley and W. G. Smithson; hon. secretary, Mr. Robert P. Oglesby; hon. treasurer, Mr. W. H. Thorp; hon. librarian, Mr. G. F. Bowman; members of council, Messrs. R. Wood, C. B. Howdill, P. Robinson, T. E. Marshall, F. Musto, and G. E. Reason; auditor, Mr. Henry Oliver; collector, Mr. F. E. Yeates. Several members bore testimony to the admirable work accomplished by Mr. Butler Wilson, the retiring President, during his three years of office, and spoke in praise of Mr. H. S. Chorley's work as hon. secretary. A paper was afterwards read by Mr. Starkie Gardner, F.S.A., on "Lead in Architecture."

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—A meeting of this Society was held in the Society's Rooms, Leopold-street, on the 24th ult., Mr. T. Winder presiding, when Mr. E. C. Skill gave a lecture on "The Elements of Architectural Photography." The lecturer gave a description of the camera best suited for architectural purposes. He condemned the hand camera as being wholly unsuitable for this class of work. Suggestions were made as to the most suitable lens or form of lens to be chosen, and the names of some of the most noted makes, both English and foreign, were given. The choice of time and proper illumination for buildings to be photographed was dealt with, the lecturer remarking that frequently what might have been good pictures were spoilt for want of a little care in this direction, especially by beginners. Slides illustrating this were shown. The choice of plates was next considered and comparisons made between backed and unbacked ones, and was followed by a diagram illustrating the cause of halation, which was described, and succeeded by examples of photos showing comparisons between both kinds of plates. The Iso-chromatic plates and screen were next described by the aid of a diagram showing the action of a screen when interposed between the lens and plate. On this the two extreme rays of light, viz., violet and red, were delineated and some idea of the controlling power of the screen upon the undulations of the violet ray was thus given. Two slides of exposures made through a set of coloured glasses in conjunction with white followed. First, on an ordinary plate; second, on an Iso-chromatic plate without the screen; and two other exposures on Iso-chromatic plates with different screens were shown. After this a series of slides of flower studies and views taken under similar conditions were exhibited illustrating the effect of colour under different treatment. Architectural work was then returned to, and a number of slides shown, with notes on the arrangement of perspective and the best method of lighting subjects in relief. After a few further remarks on the help of photography to the architectural student and its use in making valuable records of ancient buildings, the paper was brought to a close. The lecturer acknowledged his indebtedness to Mr. J. R. Wigfull for the loan of a considerable number of slides; to Mr. J. W. Charlesworth for the slides of flower studies; to Mr. Frank Winder and Mr. W. H. E. Wilde for the loan of photographs. The lecture was illustrated by numerous lantern slides, shown by Mr. J. Atkinson, of the University College. On the motion of Mr. Holmes, seconded by Mr. Jas. Miller, and supported by Messrs. F. A. Winder and Wigfull, a hearty vote of thanks was accorded the lecturer.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The Edinburgh Architectural Association held their first visit for the session on Saturday afternoon, when a party of members visited Gothic Ironworks at Camelon, by permission of the proprietors, Messrs. R. and A. Main. The members were divided into sections, and under the leadership of Messrs. Main and Miller were shown over the works, and inspected all the various departments, from the blast furnace and casting shop to the finishing shop and show rooms. The visit was both instructive and enjoyable, and additional interest was lent to it from the fact that the works are built on the site of two Roman camps, a short description of which was given by Mr. Thomas Ross. In the absence of Mr. Hunter Crawford, President, Mr. Thomas Ross proposed votes of thanks to the Messrs. Main for their kindness in allowing the members to visit the works, and especially for having the works kept in operation during the afternoon.

ARCHÆOLOGICAL SOCIETIES.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.—The fourth evening meeting of this session of the Bristol and Gloucestershire Archæological Society was held at the Literary and Philosophic Club, Berkeley-square, on the 24th ult. Dr. Alfred Harvey presided, and after some announcements by the hon. secretary for Bristol (Mr. John E. Pritchard), the Rev. Vernon Holt, M.A., continued from the previous meeting his notes on the subject of Heraldry, touching first upon the ordinaries, and going on to speak of the lion, eagle, and miscellaneous charges. Mr. James McMurtrie, F.G.S., in the course of a paper on Roman roads, stated that when the Romans first landed in Britain, and had established themselves in the south-eastern parts of England, the same necessity for better means of communication arose as had arisen in their own land. But it was not to be supposed that the ancient Britons were entirely without roads or tracks. There is presumptive evidence of a more or less primitive means of communication between the different parts of the petty kingdoms, and such roads as existed no doubt followed the most accessible routes between the camps, strongholds, and settlements which had existed before the Romans came. The invaders had not, therefore, to devise an entirely new scheme of roads. It may rather be supposed that, taking advantage of such road tracks as previously existed, they advanced over them to attack those strongholds, the possession of which was necessary to the effectual subjugation of the country. They would, no doubt, gradually improve the roads, and add to them those great imperial and military roads stretching westwards through England and Wales, and northwards to the borders of Scotland.

EAST RIDING ANTIQUARIAN SOCIETY.—The first meeting of the winter session of the East

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Riding Antiquarian Society, which this year has been delayed, was held on the 21st ult. at the Station Hotel, Hull, under the presidency of Lord Hawkesbury, the President of the Society. A paper by Mr. Thomas Blashill, F.R.I.B.A., author of "Sutton in Holderness," etc., on the condition of the countryside before the enclosures of the XVIIIth century, was read by Mr. T. Sheppard, curator of the Hull Museum, in Mr. Blashill's absence. This was illustrated by excerpts from legal documents relating to particular farms in Sutton.—Lord Hawkesbury, after referring to the open field system, passed on to refer to the chronicle of Meaux Abbey, and said it would be extremely interesting to know the plan of the Abbey if it could be discovered. It always seemed to be one of the objects of a society like that to bring to light things of that kind. One of their best works had been the excavations at Watton.—Mr. Cole said he had been carefully over the manors on the coast, and by comparing the number of parishes mentioned in Domesday with the number of acres now, it gave some idea of the destruction of the coast land and the quantity of land which had been lost out of different manors by the coast erosion.—Mr. Sheppard said Mr. Blashill had at first thought of comparing life in Holderness with life on the Wolds, which would have been a useful and valuable comparison, but he hoped they could get Mr. Cole to give his version of life on the Wolds, and they would then be able to make a comparison. With regard to the coast erosion, Mr. Sheppard said it had been ascertained that the average from Bridlington to Spurn was seven feet per annum. He should like to lay particular stress upon the value of getting people to allow antiquarians the privilege of looking through old documents before they were destroyed. A plan of the river Hull, dated 1648, showing the fortifications of Kingston-upon-Hull, came to light after being knocked about at Beverley, and which otherwise would have been thrown out of a solicitor's office together with some other old documents. Personally, he thought the most interesting work the Society could do in the near future would be to undertake a series of excavations of the site of Meaux Abbey, especially having regard to the admirable work of the Society at Watton.

Illustrations.

SKETCHES IN NORMANDY.

THE church at Beaumont-le-Roger, part of which is shown in the sketch, is a fine piece of architecture set in the most attractive position; the village is a small one at the base of a precipitous hill covered with fine trees, and as you walk to it from the railway station the whole church and town is silhouetted against the dark foliage; close by are the ruins of a fine abbey. The drawing shown was made in the village street, too close to the church to show the background. Internally, the church has been much spoiled by a classic transformation.

The north porch of St. Gervais is one of those built on the plan of an equilateral triangle, two sides of which give access from the street to the porch, the third side being the church door proper. The sketch is rather a study of picturesque architecture in black-and-white.

W. CURTIS GREEN.

INEBRIATES' HOME, LINGFIELD COLONY.

THIS building was designed to be erected at the Training Colony, Lingfield, as an inebriate reformatory or retreat under the Act of 1898. In this training colony there are already erected homes for youths and able-bodied men sent from the workhouses and also for epileptic children, who had been hitherto confined in the senile and infirmary wards of the workhouses. It was thought that in such a colony a home for inebriates should be established where they would be not merely prevented from all access to intoxicating drinks, but where, under the healthful influences of home life in the country and by labour on the land, their physical vigour would be restored and new habits and tastes be formed.

The building is designed to accommodate fifty male inebriates; and, in order to insure the strictest economy, all corridors or passages occupying needless space have been omitted. An open verandah gives access to the various rooms on three sides of a quadrangle, the fourth side being left for a chapel to be erected in the future. By adopting this form of structure supervision is made easy and escape of the inmates most difficult.

There are three dormitories on the ground floor, each containing twelve beds, and one dormitory on the first floor containing fourteen beds. At the end of each dormitory two cubicles are provided for home brothers, who are responsible for the supervision of the dormitory according to the method adopted in the other homes at Lingfield, following the examples set in similar homes in Germany. A special feature of the plan consists of the club-room attached to each dormitory; the men are not thus massed together in barrack style and are more easily dealt with by the home brothers. A range of workshops is provided as required by the Act, and in addition four small isolation rooms are placed next the superintendent's house, which commands the entrance to the building.

The walls are to be built of bricks from the colony's own brickfield and will be covered externally with rough cast. The roofs will be covered with red tiles.

The drawing was exhibited in last year's Academy. The architect is Mr. T. Phillips Figgis.

BILLIARD ROOM, POLAPIT TAMAR, LAUNCESTON.

THIS is the interior of a billiard-room in a house in Cornwall, designed by Mr. R. P. Whellock. The drawing was exhibited in last year's Royal Academy.

HALL AND STAIRCASE, STIFFORD LODGE.

STIFFORD LODGE, the subject of our illustration, is the lodge of the manor house of Stifford, a pretty village in Essex.

Odo, Bishop of Bayeux, was formerly lord of the manor, and the mysterious Turold of the Bayeux tapestry (probably Turold d'Envermieux, afterwards prelate of Bayeux), was the father of Turold, an undertenant of Stifford, at the time of Domesday Book.

William Peveril, a natural son of William the Conqueror, lived in Stifford, and was the founder of the family of Peveril of the Peak.

The house, now in the occupation of Mr. Herbert Brooks, was the lodge of the ancient manor house, and is interesting for alterations made at various periods. It has recently undergone restoration, and some modern work has made way for the staircase shown in our illustration. Some oak panelling, whitewashed, which originally formed the enclosure to the cellar stairs, has, at the instigation of Mrs. Brooks, been removed and renovated, and is now used as panelling to the hall fire-place.

The builder was Mr. J. J. Laurence of Grays, Essex, and the architect Mr. Christopher M. Shiner.

The drawing was exhibited at the Royal Academy last year.

VICARAGE, LINDFIELD, SUSSEX.

THIS vicarage, lately built, is the outcome of a trust fund bequeathed for the purpose, some years back, by the late Miss A. H. Davis, of Lindfield; and it has been erected on a site, of 2 acres, presented by Mr. Wm. Sturdy, of Pax Hill Park.

For the exterior of the building local materials have been chiefly used, brown tiles for the roofing and red for tile-hanging, with light red bricks for the ground story wall-face, and Pax Hill stone for the plinth, front entrance doorway and chimney caps. Special thin bricks are employed for the chimney-stacks, which are built slightly battering at each end. The coved cornice and gable mouldings are executed in Portland cement finished with washable distemper.

A governing feature in the plan of the house is the garden-entrance inner hall—from which the sitting-rooms open—shut off by swing doors from the front entrance hall. To this latter there is an independent approach from the servants' quarters. There is also a special service-route to the dining-room; so that, with two doors to the study, the inner hall can be free from intrusion, and is available, on occasion, as an extension of the drawing-room by means of double doors.

The total cost of the work, including drive, fencing and entrance-gates, was about 2,700*l*. Stabling has since been added, at a cost of 360*l*.

Messrs. Anscombe and Hedgecock, of Lindfield, were the builders; the grates, ranges and hot-water service being supplied by Messrs. Edwards and Son, of London. Mr. Walter Millard was the architect.

THE SANITARY INSTITUTE:

MUNICIPAL REHOUSING.

A SESSIONAL meeting of the Sanitary Institute was held on Saturday last week at the Parkes Museum, Margaret-street, the Rev. H. Russell Wakefield, the Mayor of St. Marylebone, presiding, when Mr. W. E. Riley, Architect to the London County Council, opened a discussion on "Municipal Rehousing."

Mr. Riley first said a few words about displacements and the authorities empowered to act. Previous to the passing of the Act of 1890, the Metropolitan Board of Works had initiated and carried out clearance schemes under the various Artizans' Dwellings Acts, 1875 to 1882. Twenty-one thousand two hundred and seven persons were displaced, and accommodation was provided in new dwellings for 27,066 persons, the cleared sites having been sold to dwellings companies and others for this purpose. The Metropolitan Board of Works had also initiated other clearances, displacing 6,188 persons; the completion of these schemes was carried out by the Council, and dwellings erected on the cleared sites under Part I. of that Act to accommodate 2,930 persons. Under Part I. the Council had initiated and carried out, or was proceeding with clearance schemes displacing a total of 14,784 persons, and when all the new dwellings in connexion with these schemes had been completed a total accommodation for 14,970 persons would have been provided. Part II. might be briefly described as a diminutive operation on the lines of Part I. The Borough Councils as well as the London County Council were empowered to act, and the Local Government Board was the confirming authority. Under this part of the Act the Council had initiated and carried out four schemes displacing 1,855 persons, and accommodation had been provided in completed dwellings for 2,314 persons. The Borough Councils had undertaken schemes involving the displacement of 4,123 persons, and when the new dwellings were completed accommodation would have been provided for about 3,000 persons. Under Street Improvement Schemes, the Metropolitan Board of Works by the sale of sites to dwellings companies provided accommodation for 10,688 persons. The Council, under their improvement schemes, completed and in hand, would have displaced 15,257 persons; and on the completion of all the dwellings proposed accommodation would have been provided for 16,430 persons. Railway companies and other large corporations, whose operations in any one scheme involve the displacement of thirty or more persons of the working classes, must under Clause 1 of the Schedule of the Amendment Act, 1903, rehouse under the discretion of the Local Government Board. In addition to these cases of displacement, there was an insidious process of destruction of small residential property constantly taking place in the county through private enterprise, and where there was no obligation, either under the Housing Act or under any special Acts, for those interested to rehouse. In the past three years building of property which had been brought under the notice of the London County Council had involved the displacement of 6,570 persons, but the proposals did not provide for rehousing more than one-third of that number, and there was no authority charged with seeing that the rehousing proposed was carried out.

To make clear what was meant by overcrowding, he asked them to note that it had been laid down in the operations of the London County Council that not less than 400 cubic ft. of air space should be provided per person in their dwellings (for children under ten years, 200 cubic ft.), and that in any tenement the total number of persons should work out at not more than two to a room, but infants born in the tenements did not count until they attained five years of age, when they were reckoned as half an adult up to the age of ten years. We learn that the population increased during the ten years 1891 to 1901 from 4,228,317 to 4,536,541. Notwithstanding this increase of 308,224 (7·3 per cent.), the number of single-room tenements in which more than two

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persons were "enumerated" declined from 56,727 to 40,762—a very remarkable decrease, indeed; whilst the number of one-room tenements with six or more inmates fell from 4,097 to 1,802. With regard to the one-room tenements occupied by more than two persons, not only did we find a reduction in the number of such tenements, but, more important still, a reduction in the average number of persons occupying those tenements—the number per room in 1901 being 3·62, as against 3·80 in 1891. Moreover, the number of persons living more than two in a room in tenements of one to four rooms decreased from 831,668 in 1891 to 726,096 in 1901, or from 19·66 per cent. to 16·0 per cent.

Generally speaking, not only the amount, but the intensity, of overcrowding had been reduced, the greatest reduction having taken place in the most significant instance of all—*i.e.*, in the case of one-room tenements, from 172,500 to 149,500 tenements; and, summarising the results under two main heads, it was found that tenements of less than five rooms have increased 6·3 per cent., while the population occupying such tenements has only increased 4·7 per cent.; tenements of five or more rooms have increased 12·5 per cent., while the population occupying such tenements has increased only 10·4 per cent.

The meaning he attached to "rehousing" was illustrated by a case which came before the magistrate at Bow-street on July 12, 1899. A poor woman occupying a tenement of two rooms on the third floor of Windsor-court was required to vacate her rooms in connexion with a clearance scheme. One of the rooms she occupied had an area of 184 sq. ft., and the other, which could only be regarded as a box-room, lighted from a well-hole used for storing lumber, was 54 ft. super. The sanitary convenience was entirely inadequate, and was common to four tenements. Besides herself, the family comprised her husband and four children, and one living away from home. The rent paid was 5s. 6d. per week. As she would not leave, the Council applied for an ejectment order, and she told the magistrate that she could not afford to rent one of the Council's tenements which was reserved for her at Millbank, and would have cost her 8s. 6d. per week. The tenement offered her comprised a living-room, 144 sq. ft.; one bedroom, 120 sq. ft., and a second bedroom over of 145 sq. ft.; with a scullery and independent sanitary convenience. This accommodation would have allowed the fifth child, the eldest daughter, to live with her parents, which she was unable to do at Windsor-court, and was the minimum standard of accommodation that the Home Office would approve as suitable for such a family. She was paying weekly 2s. 3¾d. for each 100 ft. super. under the old insanitary conditions, whereas the Council was in a position to rehouse her family in a thoroughly sanitary way without any charge on the rates at a little over 1s. 10¼d. The magistrate remarked that the rent charged by the Council was too high, and should begin at 6s. per week in order to allow persons so displaced to live at Millbank without much increase of rent. No comment was made on the proportional increase of area required by such a family to conform to the provision of the law, or what charitable authority should provide and pay for the needful additional room for their proper accommodation. It could not be economised in bricks and mortar, and, therefore, in this case the magistrate's criticism advocated a charge on the rates. He reluctantly allowed the ejectment order, but gave full time for compliance—*i.e.*, thirty days.

This and similar cases appeared to need some answer by those who waste their energies in criticising the rent level and the dwellings built by the London County Council. They did not understand that the operations of the Council in this work have necessarily to be conducted on a sound financial basis. It might be accepted as a broad rule that the price of land and the most economical use of it govern the maturing of any housing scheme in the central districts of London. It generally cost 15s. to 17s. per ft. super. to clear slums in central districts, but very few housing schemes could be made to pay if the charge for land alone was more than 5s. per ft. In bringing the idea home to their minds of the necessity of obtaining some kind of financial support in dealing with this part of the problem, the handsome donations which started the Peabody Fund and the Guinness' and Hales' Trust Funds might be cited as examples which had enabled charitable individuals to initiate vast housing operations which had subsequently been carried on with great benefit to the poor without financial embarrassment. The price paid by ratepayers for clearing areas and rehousing the poor upon them was an investment which it was presumed repaid itself in better sanitary conditions and in the general welfare of the community.

The following particulars relative to the mortality in the Council's dwellings for the year 1903 might be of interest. The death-rate from all causes was 11·8 per 1,000 living, as compared with 15·2 in London as a whole. Taken singly the population of the various blocks were not sufficiently large to give reliable results, except, perhaps, Boundary-street estate, which had a population of between 4,000 and 5,000. At Boundary-street the death-rate worked out at 12·7 per 1,000 living, as against a corresponding rate in Bethnal Green of 18·2. It might be noted that the death-rate when the insanitary area was represented was 40·1 per 1,000 living.

The statistics on the question of rehousing the displaced persons in the dwellings built for their accommodation was not, on the whole, very encouraging. In 1897 a return was made showing the particulars of the number of persons residing in new dwellings who were displaced or removed from areas cleared by the Council. Of the 1,210 displaced by the Blackwall Tunnel works, only nine of them took advantage of the new accommodation. Of the 5,719 displaced in the great Boundary-street clearance scheme, although accommodation had at that time been provided for 1,500 persons, eleven only were living on the area. There were necessarily rules and regulations enforced in the management of dwellings, and the dislike of the slum inhabitants to any semblance of supervision probably accounted for the fact that so few availed themselves of the new accommodation. As an illustration of this, it might be mentioned that 100 of the families displaced in the initial stages from the Boundary-street area were fortunate in finding accommodation in the new buildings of the Guinness' Trust just then completed, viz., Columbia-buildings; but he was informed that not one of these families remained in occupation three months afterwards, the reason given to him being that they would not accept the discipline and control. Returns had been made which brought this interesting portion of the question up to a recent date. In the Falcon-court scheme, sanctioned by the Local Government Board on July 12, 1898, the number of persons displaced was 800, the number for whom new accommodation was provided was 500, and about forty persons availed themselves of the new accommodation. A large scheme at Millbank afforded special facilities for rehousing persons whom it was proposed to displace in certain projected improvements—*e.g.*, the Clare Market scheme, the Westminster improvement, and the Holborn to Strand improvement. There were seventeen blocks of dwellings, providing accommodation for 4,430 persons in 895 tenements, and much of this accommodation was built in advance of the displacement under the various improvement schemes. On October 7, 1902, when all the blocks were completed, twenty-two of the tenants displaced at Westminster and three from Clare Market were then in occupation.

A better result was obtained in the rehousing scheme for the Clare Market and the Holborn to Strand improvements. It was laid down as a condition of approval that in the immediate vicinity of the improvement accommodation should be provided for 1,000 of the persons displaced. Sites were acquired in Drury-lane and York-street and great care was exercised to obtain, as far as possible, the full details of the accommodation required for the various families it was intended to displace, and the plans of the five blocks of dwellings which were finally decided upon provided as closely as possible the accommodation needed. A return was made in October, 1902, showing that the whole of the tenements in Drury-lane had been occupied by persons actually displaced in connexion with the improvements. The buildings provided provoked a good deal of adverse criticism, and some effort was made to draw comparison between the rooms vacated by one of the tenants and those which had been provided in the Council's dwellings. Irrespective of the dilapidated and insanitary condition in which the vacated property was found to be, the rent per foot super. paid by the tenant was about 4s. 4d. per square per annum cheaper in the new dwellings than in those vacated. The cube space was 8 per cent. more; an independent water-closet, a scullery with boiling copper and sink, were provided in addition, as against one water-closet and one sink used in the vacated quarters by three tenants. The balance of the accommodation needed was provided at York-street, and he was informed in November of last year that the tenements in those dwellings also, with few exceptions, had been filled by the dishoused persons.

In connexion with Rotherhithe Tunnel scheme, an estate was nearing completion which was intended to accommodate the persons displaced by that work. The dwellings were again provided in part before any displacements were made, but the proportion of persons who availed themselves of the new accommodation was small, and the privilege of offering tenements to other persons about to be displaced in order to progress the work had been granted. The total accommodation which would be provided when the estate was completed would be sufficient for 1,200 persons. The rents were low and the accommodation had been carefully designed in order to meet the wants of those displaced, and it was, therefore, somewhat disappointing to find that numbers of those tenements were still unlet, entailing charges on the tunnel scheme.

In what he had already said, he had not touched on the very excellent work done by Glasgow, Liverpool, and other provincial towns in connexion with municipal rehousing. In Glasgow, under the Improvement Act of 1866, powers were given to the Corporation to reconstitute various portions of the city which were insanitary. The powers entailed the obligation of providing accommodation for the working and poorer classes displaced by the erection of suitable dwellings. In 1901 there were 1,500 tenements in blocks accommodating 7,000 persons already erected under the Act of 1866. There was a family home containing 160 single rooms, each capable of accommodating an adult and three children, and six lodging-houses for men and one for women, which, inclusive of the family home, accommodated about 2,700 lodgers. A new Act was obtained in 1897 entitled "The Glasgow Corporation Improvement and General Powers Act," under which the Corporation were authorised to deal with certain insanitary areas and to acquire additional land not exceeding twenty-five acres, within the city or within half a mile of the city boundaries. This Act entailed many of the restrictions of the Housing Act, and would probably be found to hamper the freedom of the earlier housing operations carried out in Glasgow. The earlier schemes in Liverpool were carried out under the Liverpool Sanitary Amendment Act, passed in 1864. It was claimed that the insanitary property could be acquired more economically than under the Housing of the Working Classes Act of 1890, the local Act being more rapid in procedure. The portions carried out under this Act up to 1901, on the whole, involved a charge on the rates. With the increased financial difficulties the problem of providing suitable accommodation was becoming more acute in every scheme which was developed. The Amendment Act of 1903 appeared to hold out the hope that the redemption period might be extended to eighty years, but the recent Treasury decision against the extension of the period so far as the cost of erection was concerned had deferred the realisation of that much desired relief for an indefinite time.

Mr. E. Bond, M.P., in proposing a vote of thanks to Mr. Riley for his address, said there were one or two points to which he must take exception. Mr. Riley said that all the housing companies which had taken part in the reconstruction of London had received assistance in some form or other of a more or less charitable kind. As far as the company with which he (the speaker) was concerned, that could not be said to be true, except, perhaps, as to one or two sites obtained in the early days of the Company from the late Metropolitan Board of Works. But any advantage the company gained was precisely the advantage the County Council gave to itself. When the County Council adopted a scheme and cleared a site for the purpose, the whole cost was not charged to the scheme; it was considerably reduced and the balance was written off as representing a sanitary improvement of the Metropolis. To that extent, no doubt, the company he was connected with took advantage of one or two

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sites being cleared, but they found it quite as easy to deal in an ordinary commercial way with slum areas. They had cleared slum areas away and had charged the whole cost against the housing scheme, and had made it pay without any charge on the rates or anyone else. He did not say that that could always be done. There were some areas where, owing to the multiplicity of interests involved, that could not be done, and in such cases they had to pay heavily for improvements. The question of housing was really a question of ordinary economics; it was a question of the relation of means to objects of desire; a question of wages, a question of what people could afford to pay for accommodation. There was plenty of accommodation to be had by people who could afford to pay for it, provided in the ordinary commercial way by people whose interest it was to do it; but the real difficulty arose from the fact that there was a very large portion of the population not able to pay for decent housing accommodation, such as our sanitary laws now require. While, on the one hand, wages had risen, on the other, he was afraid, the cost of providing housing accommodation had risen out of proportion to the increase in wages. He found that to put up rooms suitable for occupation by the labouring classes cost a good deal more than when his company began operations. That was not due to any increase in the cost of land—although land had a tendency to go up in value—but it was almost entirely due to the rise in wages in the building trades, in the cost of materials in those trades, and to some extent to the greater stringency of the regulations of the local authorities with the object of securing better buildings and making the dwellings which were to be erected more sanitary and healthy. But that brought him to the point whether it was desirable for local bodies, such as the L.C.C., to go in for this business at all. There was a great amount of overcrowding in the Metropolis and a great many slums in which people lived under conditions which were loathesome, and it was argued that for these reasons the County Council was justified in clearing away the slums and erecting dwellings in which people could live decently. When that argument was examined it would be found to be a delusion and a sham. It was obvious from the figures that had been given that people who had paid the most they could in the slum areas could not pay an increase in their rent such as they generally had to do in the County Council dwellings. Was it worth while then for the Council, if they could not provide dwellings such as people who were turned out of slums could afford to occupy, to attempt the thing at all? There was no lack of accommodation for "the aristocracy of the working classes." People who could afford to pay eight shillings to twelve shillings per week could get plenty of accommodation without the aid of the County Council. Take the Tottenham estate scheme of the L.C.C. It was entirely outside the Council's area, and it was contiguous to the Noel estate—a large estate belonging to the Artisans and Labourers' Dwellings Company—which estate the company had found something of a white elephant. They had built some houses of the kind the County Council were putting up, but they found they soon outran the demand, and consequently a large part of the Noel estate remains unbuilt upon. The County Council, not content to let the company develop the estate, had embarked on a scheme which at one time or the other was to house a population of 42,000 persons. That was a speculation in which the Council had no right to enter with the ratepayers' money. The cottages there, of three bedrooms and two living-rooms and offices, were to be let at twelve shillings per week. That was rather an outside rent.

Mr. Riley: It includes rates and taxes.

Mr. Bond: Yes, but there were cottages at Wood Green and elsewhere which provided as much accommodation which until recently were let for a lower rent. Accommodation of that kind could be had all over London, it was quite clear, by people who could afford to pay for it, and he did not know that any extra amenities were to be provided in the L.C.C. houses. It had been the misfortune of London that it was composed of an aggregation of villages. This particular estate at Tottenham would present the same appearance as Bethnal Green did when Bethnal Green was new, except that we had improved our architectural ideas somewhat. He did not think it judicious that local authorities should take upon themselves to assist in this kind of development more than was absolutely necessary. Municipal authorities, when they found large unhealthy areas which could not be dealt with by private enterprise, might very reasonably clear them as sanitary improvements, and he thought that the legislature was wise when it laid it down that the clearing authority should not itself build until after it had failed to let or sell the site to an outside body for the purpose of building. From that wholesome rule the legislature departed some time since, and now they had gone the length of passing Acts which enabled the local authorities to enter into building speculation. It was difficult to say that this kind of work did anything to solve the question which they were all anxious to solve, and which was not capable of solution by any one drastic remedy—*i.e.*, the problem of providing that everyone should have wages or income enough to enable them to lead a wholesome and decent life. If that state arrived at all it would come about by the slow operation of economic forces. If they were going to employ public money for rehousing purposes they should make the strongest endeavour to provide dwellings of such a kind that the people who lived in the slums would be able to afford to live in the houses so erected. That was rendered difficult by the fact that when a large public body took up work of this kind and put up dwellings it wished to put up only such buildings as would stand the closest possible scrutiny as to methods of construction, the appearance of the buildings, and the accommodation provided. The real reason why people lived in slums was partly because the accommodation they got there was cheaper than what they could get elsewhere, and partly because they were near their work. Those slum dwellings ought to be cleared away and better-arranged and more wholesome buildings erected in their place, but at a rent which the displaced inhabitants could afford to pay and without any burden on the rates.

Alderman Thompson, of Richmond, seconded the vote of thanks. Although there was a good deal to criticise in what the London County Council had done in regard to the expenditure of money in the clearance of slums, and the nature of the dwellings which they had provided, yet it had been far more pleasurable to him to hear what they had done than the remarks made by Mr. Bond. Any activity in the direction of providing sanitary dwellings for the people should receive encouragement rather than discouragement, and it filled him with dismay when he heard Mr. Bond say that they should not take active part as sanitary authorities in this matter. Mr. Bond said that there was plenty of accommodation for those who could afford to pay. That was a fallacy. The ordinary artisan, with a family, who was earning good wages could not find suitable accommodation in or near London at a rent which he could afford to pay. The view the working class held was that private enterprise did not provide in its dwellings suitable houses for the mechanic to occupy, let alone the unskilled labourer. All round London for five or six miles out there were few decent cottages suitable for the working classes. Directly any decent dwellings were provided after a clearance there was a great rush for them by the ordinary working people. The great mass of respectable artisans were living under unhealthy conditions. He had taken the trouble to find out how the families of an ordinary Board School, not in a slum area, were living, and he found that 80 per cent. of them were living in two rooms, five families to a house, with no separate sanitary convenience or separate entrance, and that each family paid from 5s. to 8s. per week for such accommodation. When these were the facts, could it be said that private enterprise had provided sufficient accommodation? More than that, a man with 200*l.* a year could not easily get satisfactory accommodation of the kind required. Private enterprise had put up the wrong kind of dwellings altogether. Look at the new suburbs! There were long streets of houses with bay windows which had not been put up for the accommodation of the working classes, which were built to let in one occupation at about 40*l.* per annum; they were generally occupied now by three or four families. Some authority should step in and put up dwellings suitable to the requirements of the working classes and at a rent they could afford to pay. Where the authorities had taken action it was because of the absolutely necessary to do something, and if the London County Council had not stepped in we should not have seen such a marked diminution in the number of one and two room tenements, the diminution in the death-rate, and that steady, though slow, improvement in the condition of the masses of the people. There was a real lack of housing accommodation for all kinds of workmen. He was glad that there was a tendency on the part of the local authorities to abandon the block system, because the rooms in these blocks cost twice as much to build and because they were not healthy. The death-rate in blocks of model dwellings was very high.

Mr. Bond: The death-rate in the dwellings I am connected with is 12·7 per 1,000.

Alderman Thompson: That was for the best year. It was not so much a question of internal arrangements in these dwellings, but that people at the top of them were poisoned by the air coming from below. Then, again, the sunlight was shut out of the big blocks with a consequent lowering of vitality. As a rule, there was the highest death-rate where there was the largest number of families in a given space. The block system was a bad one on sanitary grounds, and it was also an expensive system of housing. What was far preferable was the system advocated by Dr. Sykes, of purchasing existing middle-class houses in the vicinity of slum areas, and, instead of pulling them down or letting them to four or five families, of adapting them for purposes of occupation by three or four families. This had been tried and found to pay 1 per cent. better than if new houses were built. He did not believe in local authorities buying slum properties. Such property ought to be condemned and the cost of destroying it ought to fall on the owners. It was not satisfactory that a six-roomed house in the suburbs should cost 12s. per week. He had been mainly responsible at Richmond for the municipal housing scheme, and 132 six-room and scullery cottages had been erected. The highest rent was 8s. per week, the average rent of the majority was 7s. 9d., and some were let at 7s. 6d. per week. Those cottages paid remarkably well, contributing about 500*l.* to the rates, and the tenants were very much healthier than they were in the slum area. In every case there was a garden both back and front of the cottages, and they paid for the land twice as much as the County Council paid at Tottenham. They were able to do what they had done because their cottages cost less to build than did those erected in London. Mr. Bond was right when he referred to the increased cost of building being the cause of the increased cost of rent. Taking the rent of a six-roomed cottage as 7s. 6d., the interest on the cost of building that cottage at Richmond was 3s. per week, but the interest on the site and gardens and the construction of roads and sewers was only 8d. per week. This increased cost was due, no doubt, to the stringency of the regulations and to what he would call sanitary fads which did not make people more healthy. Regulations made to apply to big blocks of buildings were also made to apply to cottages erected in the country. There was a point where solidity and substantial building could be carried to an excess, and some County Council buildings seemed to be rather too well built, though that, of course, was a good fault. The Richmond buildings were good enough for all practical purposes, would last for 100 years, and they cost very little to keep in repair. The Local Government Board and the London Building Act insisted on the party wall in London buildings being carried up through the roof, which added, of course, to the cost of buildings, but at Richmond they did not think of doing that. Then there was another absurd condition. A third bedroom was wanted in a workman's cottage; they had tried over and over again to get the Local Government Board to permit them to put an attic floor on a 9-in. wall. That was a simple thing to do so long as the height was not carried up too far; but to do what the Local Government Board required meant an addition of 50 per cent. in the cost of the brickwork and a consequent increase in the rent. He did not quite agree that the increase in the cost of labour had been quite so much as Mr. Bond implied. From Laxton's Price Book he found that there had been nothing like the increased cost in labour which one sometimes imagined. On the other hand, there had been considerable increase in the cost of the materials used. Owing to the action of the brickmakers, stock bricks had increased from 35s. per 1,000 in 1894 to 47s. in 1900. The same thing applied

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to cement. In one or two cases there had been an actual decrease in the cost of labour. He thought the County Council, so as not to be at the mercy of a ring of brickmakers. It was a mistaken view to say that because municipalities did not do everything perfectly they should do nothing at all, and he hoped the London County Council would go on with its work, though he wished they would alter the type of the buildings—putting up not a less sanitary but a less faultless type of building. He felt sure that cottages to cost from 200*l.* to 250*l.* could be erected.

Dr. Sykes said that in effecting a street improvement houses were pulled down and new ones were erected for the displaced people to occupy, and the people so displaced would probably go into them; but when a slum area was cleared, they did not go into the new buildings, and they could not be made to go. The dwellings companies had one advantage at least over the County Council: they could pick and choose their sites, and that was a great advantage. The municipalities were practically tied down by the medical officer who condemned an area. There were companies which had built excellent dwellings and others which had built execrable buildings. There was no supervision in regard to the provision of such buildings beyond the requirements of the Building Act, which did not touch on the internal arrangements of the dwellings. He hoped that the municipalities would never build down to the class of people they dishoused. Mr. Thompson said that the houses which were being put up round London were not houses for the working classes, but were ordinary houses with rentals of 40*l.* to 80*l.* per annum. That was so. It paid the builder to erect such buildings in the hope of getting better class tenants to pay such rents, and at the worst he was able to sub-let. The builder tried to let the house in one occupation; if he failed he let it in two parts, and ultimately four or even six families might be accommodated in the building, which had not proper sanitary or domestic conveniences for so many occupants. As to the block system, they might have an ordinary house tall as a flat, and if they did, and it was sub-let, they might have just the same result of foul air rising as they did in a flat. He did not object to the block or flat system, but to the sub-letting of houses without any alteration of their internal arrangements. There were ten-roomed houses with ten families in them, and with accommodation only sufficient for one. The owner might be made to put in another water-closet, and, if so, it was generally put in a most inconvenient place so far as the tenants at the top of the house were concerned. That was a matter which had been entirely over-looked by the legislature, and something would have to be done as to it.

Mr. Hair, of Southampton, said the latest and the best arrangement was the double tenement house—one cottage on the ground floor and one above. At Southampton, in the heart of the town, they were proposing to build sixty-six of these cottages, and the cost would be 160*l.* per three-roomed cottage.

The Chairman, in putting the motion, said he did not feel a strong objection to municipal enterprise in the matter. The charge on the rates, which seemed to frighten so many people, would sooner or later considerably reduce rates in another direction. The moral development and the growth of self-respect, which were likely to result from the provision of proper house accommodation, would be likely to decrease rates. It was an appalling fact that so few of the dishoused people went into the houses provided for them, but perhaps the fact was that the new buildings were occupied by people who vacated dwellings only a little less satisfactory, and that these were taken by the dishoused persons. He was afraid that houses must be built in the centre of towns because people must be kept near their work; they could not afford to go out as far as Tottenham or Richmond.

The motion was heartily agreed to.

Mr. Riley, in reply, said that the 7*s.* cottage he referred to included all rates and taxes. Block dwellings were a necessity under the Act, and were essential in central districts. He could not agree that the adaptation of any Georgian mansion or any dwelling in a central district would lead to a sanitary result. He was aware of the valuable work done at Richmond, but the scheme had not been controlled by the London Building Act, whereas the County Council's work was. The cottages at Tooting were of the plainest type, and they complied with the Act. The buildings were of a good substantial character, and would be restored to the ratepayers of London in fifty-nine years without any charge whatever. They were paying their way, and there was no writing down of the land in that case. A corporate body like the Council could not build jerry buildings; they must build in a substantial manner.

A vote of thanks was accorded to the Chairman on the motion of Mr. W. Whitaker, Chairman of the Institute, and the meeting then terminated.

In the afternoon visits were made to the L.C.C. Bourne estate, Clerkenwell-road, and to the L.C.C. cottage estate at Tottenham.

COMPETITIONS.

THE COWEN MEMORIAL STATUE, NEWCASTLE-ON-TYNE.—A meeting of the Executive Committee of the Joseph Cowen Memorial Fund was held on the 24th ult. in the Committee Room of the Council Chamber, Newcastle. Dr. Farquharson presented a number of drawings, designs from different competitors, for the proposed statue. He said he thought the meeting might choose upon three of the designs, and ask the designers to send in models, offering premiums of 50*l.* and 25*l.* The committee selected "Canny Newcastle," "White Heather," and "Freedom." These, it was found, were the work of Mr. Kellock Brown, Glasgow; Mr. John Tweed, London; and Mr. T. Eyre Macklin, Newcastle, respectively.

BIRKDALE NEW TOWN HALL AND LIBRARY.—Mr. J. W. Beaumont, F.R.I.B.A., Manchester, has just made his award for the competition for the designs for the new Carnegie Free Public Library and Town Hall extension at Birkdale, the total cost being 12,000*l.* The first award is made to Mr. Geo. Brown, Birkdale and Manchester, who takes the usual architect's commission on the building; second, Mr. T. W. Haigh, Birkdale and Liverpool, who gets a 50*l.* premium; third, Mr. R. Marmon, 30*l.*; and, fourth, Mr. Hy. Halsall, 20*l.* There were twelve competitors.

Books.

Recent Excavations in the Roman Forum, 1898–1904. A Handbook by E. BURTON-BROWN. London: John Murray. 1904.

THIS little volume supplies a much-felt want in providing for the English visitor to the Forum a convenient guide, of a size suitable for the pocket, to the somewhat bewildering intricacies of the new excavations. We cannot expect to find, in a little over 200 small octavo pages, a full discussion of the various theories that have been propounded, nor an exhaustive description of the remains. For the ordinary visitor, however, the book is amply sufficient, and will be found especially interesting in that it brings out the meaning of the worships attached to the various temples of the Forum, while the more scientific reader will find that Mrs. Burton Brown knows the Forum well and writes interestingly.

A certain number of misprints can easily be corrected when a second edition is called for—*e.g.*, Curculius for Curculio (p. 17); oculautissimus for oculatissimus (p. 84); Diulius for Duilius (p. 115); Cataline for Catiline (p. 179).

A few points of detail may be shortly noticed. It is by no means certain (in fact, it seems from their relative position highly improbable) that the three tanks in the central court of the Atrium Vestæ were in use at the same time (p. 46).

On p. 71 we are told that "the altar (of Vulcan) was one of the many ancient shrines restored by Augustus, and a part of his inscription was found near it in 1848. *Then, or earlier*, the rough old altar was hidden out of sight, and the wall that now surrounds it was built to protect it from injury." The statement as it stands is unfortunate, for the words in italics are certainly not meant by the writer to refer to 1848, but to the time of Augustus.

The statement on p. 78, that the reliefs on the Arch of Severus are described in full in Professor Lanciani's *Ruins and Excavations*, is incorrect; they have not been, as a fact, scientifically dealt with in any recent publication.

With regard to the famous inscribed stele of the Comitium (pp. 93 and 99), it should be noticed that the late Professor Mommsen, in his last pronouncement on the subject (*Hermes*, 1903, p. 153), (*a*) refused to accept as certain any word but recei ("to the king"), and (*b*) referred it not to the *rex sacrorum*, but to a real king.

The whole problem with regard to the Rostra has been essentially altered by a new suggestion of Professor Richter's (*cf. Builder*, Jan. 2, 1904, p. 2), of which will have to be taken into account by future writers on the subject.

It is hardly correct to say (p. 122) that Cæsar and Augustus created a new Forum *within* the old—it was rather a case of super-position.

The great inscription in honour of Lucius Cæsar was found (and still lies) near the eastern—not the western—end of the porticus of the Basilica Aemilia, and is complete in itself (p. 141).

The statement on p. 210, that "at the end of the IIIrd century A.D. it became usual to combine bands of *opus reticulatum* with others of brickwork, a method which has been called *opus mixtum*," is incorrect. The style of construction described in the text came into vogue early in the IInd century A.D., and seems to have been given up almost entirely at the end of that century (Lanciani, *Ruins and Excavations*, p. 45); whereas the name *opus mixtum* is generally applied to a facing consisting alternately of bands of brick and small rectangular blocks of stone.

The book closes with a short bibliography and a list of some of the classical passages illustrating the text. These last might, perhaps, have been brought in more handily in the form of foot notes.

The method of citation is not always uniform, and a general reference to Lucan *à propos* of the primitive tombs (p. 222) is of little value without more definite indications; while such a phrase as "the ritual baking of the Vestals" (p. 216) is somewhat liable to misconstruction.

The illustrations are decidedly good and interesting, though it is a pity that the letters on the plan of the Niger lapis opposite to p. 97 are not used in the description in the text, for the topography is exceptionally difficult to follow, owing to the complication of the monuments themselves. On the whole the book may be cordially recommended to English readers, both to those who have the opportunity of seeing and studying for themselves the monuments with which it deals, and to those who must be content to take their information from others who are more fortunate.

Brickwork and Masonry: A Practical Text-book for Students and Those Engaged in the Design and Execution of Structures in Brick and Stone. By CHARLES F. MITCHELL, Lecturer on Building Construction to the Regent-street Polytechnic, London; assisted by GEORGE A. MITCHELL. With nearly 600 illustrations. London: B. T. Batsford. 1904.

MUCH of the subject matter contained in the present volume has already been published in the works of the authors on building construction, but the object has been to collect in the form of a separate text-book all such information upon brickwork and masonry as may be required by students and workmen who wish to make a special study of these subjects. The work has been very largely prepared from notes of the lectures delivered by the authors during the past twenty years in the School of Architecture at the Regent-street Polytechnic, and among the more important branches of work dealt with are the planning of drains, the building of revetments, the construction of domes, vaults and arches, and the planning of flues, fireplaces, and chimneys. It will readily be understood that the complete discussion of these subjects would involve mathematical problems, which at one time would have presented insuperable difficulties to most workmen, and even in the present day could not be dealt with unless by those possessing a fairly complete knowledge of mathematics. The object of the authors, however, has been to deal with the subjects in a simple manner, only using mathematics to such an extent as may be necessary to make clear the general principles of a few of

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the types of construction considered. It would be impossible, within the limits of a review such as the present, to consider in detail all the subjects mentioned by the authors, and, indeed, such a course is quite unnecessary, as their work is largely a compilation of well-known facts and general information.

We are pleased to notice, however, that in Chapter I. adequate attention has been given to the subject of Foundations, for foundation work is obviously the most important detail in a structure of any kind. The authors set forth concisely the principal causes of failure, then dealing consecutively with various methods of levelling and otherwise preparing the soil. In addition to ordinary foundations, this chapter contains some useful notes upon piling, caisson foundations, concrete and steel foundations, and grillage foundations, and constitutes a very good summary of the whole subject. Chapter II. is occupied with Brickwork, and gives detailed explanations of the different forms of brickwork, together with a large number of illustrative diagrams. The succeeding chapters, on Drains, Paving, and Masonry, are similarly of definitive character. In Chapter VI., on Walls, we find a section dealing with the question of stability, in which the various causes of failure are considered and the general principles underlying wall construction are explained in simple terms. The same chapter also contains a section dealing with retaining walls for various purposes, and here mathematical treatment is unavoidable, but, by the aid of diagrams, the authors have succeeded in dealing with the subject so that the various points put forward should be readily appreciated. Three consecutive chapters are devoted to arched structures. The first of these, entitled Arches, is little more than an illustrated description of various arch forms employed in architectural work, but towards the end of the chapter four or five pages are devoted to Bridge Construction, which, it is needless to say, cannot be adequately discussed within such narrow limits. The references made may be regarded as completing the category of arches contained in the chapter, but otherwise they are obviously of little practical value. The chapter on Vaulting, also, is mainly descriptive, but it contains a number of interesting sketches and diagrams illustrating various types of domes and vaults and the general methods by which such structures are to be developed. Skew arches are discussed in the next chapter, but the treatment chiefly refers to constructional details. Among other illustrations, a complete set of drawings is given showing the proportions for a skew arch of 20 ft. span, and we notice that the plan shows abutments which are practically similar to those illustrated in Rankin's "Civil Engineering." We may here remark that this particular form has recently been shown to be wrong. Attention was first called to this point by Professor Kernot, of Melbourne, last year, when he had occasion to inquire into the correctness of the accepted theory of skew arches. The result of his investigation showed that the usual method of designing the abutments of such arches was most seriously in error, and this conclusion has since been confirmed by other competent authorities. Hence, the plan given in the text-book now under consideration is not one that ought to be adopted in actual practice if economy of material is to be secured on one hand, or safety assured on the other. In a book of this character the point is not of so much importance as it would be in an engineering treatise, as the main object of the present authors is to impart knowledge to those who have to assist in carrying out designs, and not to make them. In Chapter X. we have ample details relative to Flues, Fireplaces, and other domestic brickwork, together with a brief reference to Tall Chimney Construction, so far as concerns the bricklayer and mason. In subsequent remarks on Lightning Conductors we notice that it is stated that "The end of the terminal is pointed and has a number of pointed branches extending out from the central stem." It is true that some terminals are made in this way, but much better protection from lightning is afforded by the use of a coronal with a number of comparatively small spikes.

The remaining chapters of the book require no special comment, being devoted to a compilation of notes upon the mechanical properties of materials, such as limes and cements, concrete, bricks and building stones, and upon excavators', bricklayers', and masons' quantities, the volume being concluded by a series of examination questions taken from those set by the Board of Education, the Royal Institute of British Architects, and other examining bodies.

Regarded in its entirety, this is a most valuable work. It is not a treatise as the term is generally understood, but a compendium of useful information admirably collated and well illustrated, and as such has a distinct sphere of usefulness.

Quantity Surveying for the Use of Surveyors, Architects, Engineers, and Builders. By J. LEANING. Fifth edition. Revised and enlarged. London: E. and F. N. Spon, 125, Strand. 1904.

A WORK of the nature of the one before us does not often present such an advance with each new edition as is the case with "Leaning." A comparison of the fifth edition with the first is very striking both as regards size and matter. This growth has resulted in the production of a book that covers almost, if not quite, every phase of the quantity surveyor's work, and which will frequently be consulted with interest by those who have long passed the period when they can be termed "young" practitioners. In fact, we can quite understand the student pure and simple being appalled by the vast amount of detail entailed in a conscientious study of the important subject of quantity surveying. For important it is, notwithstanding the prevalence in the provinces of architects relegating this portion of the work to a comparatively irresponsible assistant. We speak advisedly, as it has been our lot at various times to deal with bills of quantities which gave one the impression that the two and a half per cent. at the end was the motive for their preparation, rather than the assistance of the builder estimating, or, what amounts to the same thing, to enable the client to get his work executed at a fair price. To those responsible for bills of this description we would recommend a careful study of this work.

The chapter on "Prices" has been considerably extended, and the methods of arriving at the approximate cost of buildings will be found useful, and are based on commonsense principles. In the more detailed pricing we cannot help thinking that the author relies rather too much upon the "constants of labour," and there is no doubt he is not far from the truth when he states that "the practised estimator will seldom require these" (page 638). It would, for instance, be very easy to get a long way out in pricing where a 9½d. item required ten prices to make up the total, seven of which, amounting to 7d., are based upon these "constants" (page 639). The inconsistency is apparent when in making up the prices eighths of a penny are reckoned, while in the case of variations upon the general items, what the author terms "current generalisations" (page 646) are adopted, *i.e.*, "about twice the price of straight" and other similar calculations. We have dealt rather more in detail with this section than we otherwise should, as it is nearly all fresh matter. Notwithstanding our criticism above, there is a great deal that can be read with advantage by those interested in this particular phase of the subject. We are afraid, however, that experience will always be the most important factor in estimating, in spite of all that has been written on the subject.

While we do not think the whole of the increase in bulk is warranted by the importance of the additional matter, this new edition is a marked advance upon the earlier ones, and will help to maintain the position this work has attained as the chief of the text-books upon quantity surveying.

Transactions of the Institution of Civil Engineers of Ireland, Sixty-eighth Session to May, 1902. Dublin: John Falconer. 1903.

SEVERAL subjects of considerable interest are discussed in this volume. One of the most interesting communications refers to "The Supply of Electrical Energy in Cities." In the discussion of this paper one of the members pointed out that there was much water power running waste in Ireland that might be used for electricity if the fishing interests could be suitably dealt with, pointing out that so much water was demanded by these interests that it was extremely difficult to provide for power installations on a large scale. In another contribution Mr. F. J. Dick deals with the principles underlying the design of breakwaters of the vertical wall type, emphasising the general principles to be followed in such marine works subject to heavy seas. The author certainly attacks the problem in a vigorous manner, attempting to evolve a method of estimating the force required to overturn a breakwater. One of the points brought forward, relating to the effective specific gravity of a breakwater, may not meet with universal approval. The author takes this to be about one and a quarter times that of sea water, apparently assuming the structure to be entirely water-borne, whereas it is reasonable to suppose that some portion of the breakwater rests on the bottom. The author contends, however, that nearly every breakwater with which he is acquainted is water-borne, as the surfaces in contact, where blocks or bags of material rest upon the bottom of the sea, are in smooth water, and there are considerable areas open to water pressure, to say nothing of rock fissures and other openings. Another interesting communication, on "The Strengths of Materials of Construction," contains a novel hypothesis with regard to the constitution of isotropic materials. The author endeavours to show that a direct relation may be established between the strengths of a material to tension, compression, and shear respectively. His arguments are supported by experimental data from laboratory tests, and his conclusions are sufficient to suggest some interesting speculation on purely theoretical grounds as to the relations mentioned.

Educational Woodwork. By A. C. HORTH. London: Percival Marshall and Co.

THIS is a "Text Book for the Use of Instructors and Students in Elementary and Secondary Schools." It claims to provide a "graduated educational course of woodwork," which consists of thirty-three lessons extended over three years. We suppose the professed object of such a course is merely to give the pupils some idea of "using their hands"; if it aims further at teaching them any such rudimentary knowledge of plain carpentry or joinery as might ever be of practical use the course is badly chosen and very inadequate. At the end of a three years' course, however superficial, it might reasonably be supposed that the pupil would be able to make any such plain and useful piece of carpentry as, let us say, a dove-tailed wooden clothes chest or tool-box. Set to this job, the unfortunate would-be carpenter would remember that he had once dove-tailed two pieces of wood together, but that the result certainly did not resemble a box; further, that he had once made a small box—a pencil-box—the sides of which were not dove-tailed together, and which came to pieces, or ought to have come to pieces, very shortly after it was made. Let us suppose, however, that, in spite of his education, he manages to connect in his mind the means and the end—the idea of dove-tailing with that of making a box; but let us suppose, further, that he has to make his box deeper than the width of his available plank. He will then discover that, although he has taken "a graduated course of woodwork based on a succession of joints," he has never learnt the first joint which he finds to be necessary in practice, namely, the jointing of two planks together edge to edge. Furthermore, supposing that he has at last managed to joint up the sides and ends of his box, and to dove-tail them together, he probably will not know the right way to put in the bottom, nor will he be able either to make or to hang the lid.

We can only suppose that the word "educational," as applied to woodwork, means, as usual, the teaching a boy anything except that which is likely to be useful to him in after life. We do not wish to be unjust to the author of this book. Surely someone besides Mr. Horth is to be blamed for its apparent futility. The demand, it is said, creates the supply; and, doubtless, the book before us will be thought extremely useful by the teachers in our elementary and secondary schools.

Veneering, Marquetry, and Inlay. By PERCY A. WELLS. London: Percival Marshall and Co.

THIS little book appears to be a reprint of papers recently published in the *Woodworker* journal. It is sound enough as far as it goes, and will be interesting and perhaps useful to amateurs. Let no amateur, however, imagine that he can learn the old and beautiful art of inlaying from this or any other text-book unless he is already an expert joiner and cabinet-

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maker. Even then the instructions here given will have to be freely supplemented by the lessons of bitter experience. The first difficulty that occurs, for instance, in such elementary patterns as those of Figs. 7, 8, and 9—namely, that triangular pieces of veneer or rectangular pieces with the grain running diagonally, if fitted together dry by no means fit after they are wetted with glue—is not so much as referred to. The art is one, indeed, which cannot be properly treated in so small a compass. If a text-book on the subject was wanted at all, it should have been a much larger one, with fuller practical details and a properly illustrated history of the art in its various periods. In such purely decorative work as inlaying design is everything; and a book like this is of use to the amateur, only in giving him another opportunity, similar to those he already possesses in chip-carving and poker-work, of making himself ridiculous.

BOOKS RECEIVED.

SCAFFOLDING. By A. G. H. Thatcher. (B. T. Batsford. 5s.)

STRESSES AND THRUSTS. By G. A. T. Middleton. Third Edition. (B. T. Batsford. 4s. 6d.)

PAINT AND COLOUR MIXING. By A. Seymour Jennings. Second Edition. (E. and F. N. Spon.)

EXCAVATIONS AT PHYLAKOPI, IN MELOS. Fourth Supplementary Paper of the Hellenic Society. (Macmillan and Co. 30s.)

SAWMILL WORK AND PRACTICE. By W. J. Blackmur. (W. Rider and Son. 3s. 6d.)

OIL ENGINES. By W. A. Tookey. (Merritt and Hatcher. 1s.)

NOTES AND COMMENTS ON SEWAGE DISPOSAL. By W. H. Knight, M.S.I. (Sanitary Publishing Co. 6d.)

Correspondence.

THE INSTITUTE AND FELLOWSHIP.

SIR,—I am sure that those members of the R.I.B.A. who were unable to attend at the Institute when this very important subject was discussed will be very grateful for the attention called to it.

There has been so much of the "surveyor" and so little of the architect exhibited in the work of some members that, I believe, "the portals of admission" to membership of the Institute are quite wide enough as they are.

I recollect the "rush" that occurred some years since when it was announced that a certain society would "close its doors" except to those qualified by examination. The good nature towards comparative strangers which existed at that time was a revelation to me.

If every member of the R.I.B.A. will do his duty to the Institute when called upon, there will be no harm done. It is certain that there will be a "rush" for admission as F.R.I.B.A.; but it is to be hoped that the wheat will be separated from the tares! AN ARCHITECT.

BARNET ISOLATION HOSPITAL COMPETITION.

SIR,—These extracts from the reports of the last meeting of the Barnet Isolation Hospital Committee may be of interest to some of your readers:—

From *Barnet Press*, March 12, 1904.

"PROPOSED ISOLATION HOSPITAL.

In connexion with the proposed infectious diseases hospital, the Clerk reported that there had been over 200 applications for particulars, and sixty applications for plans. There had already been written in connexion with the matter over 200 letters.

The Chairman: When the time comes there may be a difficulty in selecting the best plan.—Cr. Clayton: If we have a special meeting on Monday morning we might get through the plans by Saturday night. (Laughter.)—The Chairman: I question if we should be able to select the best plan.—Cr. Baughen: I think we shall be able to do that.—Cr. Creagh: I am afraid we shall not get first-class architects to send in plans.—The Chairman: I think plans by some capable men may be sent in. It is not a question of getting an eminent architect; we want good plans. There are plenty of men in the profession who are not well known, but who are quite capable of doing all we want."

From *Barnet Times*, March 11, 1904.

"ARCHITECTS.

A letter was read from the Royal Institution of British Architects asking for particulars of the competition and the appointment of an assessor connected with the Institute.

The Clerk said he had known of letters having been written to architects asking them not to take part in competitions because an assessor of the Institute had not been appointed.

Mr. Clayton said he thought they could do without an assessor.

The Clerk said with 200 applicants he should think they could.

Mr. Clayton said he thought they might have a special meeting to consider the matter.

Mr. Baughen said he thought they could do without the Institute.

Major Creagh said he was afraid they might not get such a good class of architect if they did.

Mr. Clayton asked if they could be boycotted by the Institute?

Major Creagh said he was afraid they could.

The Chairman thought they would manage without the assistance of the Institute.

Major Creagh said that after all, with the assistance their medical officer could give them, he thought they would get on all right.

The matter dropped."

I have obtained the names and occupations of the twelve members of the committee for the purpose of estimating their fitness to assess the competition. The result is not very encouraging, as, with the exception of one quantity surveyor and two builders, none of them appear to possess any technical knowledge likely to be of use in doing so.

Some of the members themselves seem to entertain doubts on the subject. If, therefore, intending competitors would write individually asking for the appointment of an assessor, the committee might possibly see the wisdom of reconsidering the matter.

If I am rightly informed, the next meeting will be on April 5.

E. P. HOWARD.

AN OLD LONDON INSCRIPTION.

SIR,—I enclose a careful copy of an inscription which now occupies so unlikely a position that its existence is scarcely known. It is built into the wall of the back of the offices now occupied by Messrs. Hayward-Tyler and Co., engineers, etc., at 99, Queen Victoria-street, E.C.; this wall faces Lambeth Hill.

It is evident that "this ground" on which the almshouses were built must have been either east or west of the spot where the stone now stands, for this spot would have been in the very middle of Lambeth Hill before that street was diverted to suit the new Queen Victoria-street.

ELIOT HOWARD.

*** The following is the inscription referred to:—

IN MEMORY OF MR DAVID SMITH CITIZEN OF LONDON AND IMBROYDERER TO QUEENE ELIZABETH WHO IN YE YEAR 1584 BVILT SIX TENEMENTS VPON THIS GROUND FOR SIX POORE WIDDOWS VNDER YE CARE OF YE [GOVERNOURS OF CHRIST'S HOSPITALL. LONDON.
AND IN MEMORY OF SR THOMAS FITCH KNT WHO ON [YE BEHALFE OF THE SAID HOSPITALL. AFTER THE LATE DREADFULL FIRE IN SEPTEMBER 1666 REBUILT THE SAME AT HIS OWNE PROPER COST AND CHARGES.

The Student's Column.

ARCHES.—XIII.

TURNING back to Fig. 58, p. 317, and the accompanying explanation, it will be seen that Rankine states the true line of resistance from C to A should be determined by the condition that it shall be a linear arch balanced under purely vertical forces. This apparently indicates that, so far as concerns the portion of the arch above the joint of rupture, Rankine does not apply the characteristic feature of his theory, namely: the due consideration of the horizontal components of the external forces. Hence his method of investigating and testing the stability of a proposed arch is open to the same objection which applies to Scheffler's theory, (see Article XI., p. 287). This neglect of the horizontal components of the external forces leads to the determination of an incorrect position for the centre of pressure at the joint of rupture, the actual position of that point being nearer the intrados than the point C in Fig. 58.

Another objection to Rankine's theory is that it merely aims at the determination of a line of resistance lying within the middle third of the arch ring, and does not involve any attempt to determine the true line of resistance.

Those who desire to apply the principles enunciated by Rankine to practical arch construction will find useful the method of Professors Alexander and Thomson. These writers have developed Rankine's method of conjugate load areas in such a manner as to make it easy of application. Instead of the mathematical treatment adopted by Rankine, a semi-graphical method is substituted for construction of the load areas, reducing the mathematics and extending the system to the complete design of segmental, semi-circular, and semi-elliptic arches, with their abutments, spandrels, and piers.

In a paper contributed to the Royal Irish Academy,* Alexander and Thomson demonstrate the true shape of the equilibrium curve dividing the family of catenaries into two groups, the more important of which are termed *two-nosed catenaries*. They then show that these two varieties offer an explanation of the two distinct ways in which masonry arches fail when the abutments are gradually removed, and present elaborate tables to facilitate the design of segmental masonry arches. In this paper it is assumed that all loading due to material causes purely vertical forces acting upon the arch. When discussing the design of masonry arches in their work on "Elementary Applied Mechanics," the same authors duly consider both vertical and horizontal loads, but insist upon the importance of regarding a central elastic portion of the arch ring as entirely free from other than vertical loads, except where the live load covers only half the arch when the horizontal reaction of the light elastic spandrels of the opposite side come into play.

With the object of making clear the methods followed by Alexander and Thomson, we will first explain the manner in which load areas are dealt with.

Vertical Load Areas.—Suppose the curve A B S, Fig. 59, to be modified so as to represent a parabolic linear arch, and assume this curve to be the edge of a thin steel rib, 1ft. wide normal to the paper, supported by the horizontal thrust T_o at the crown hinge A, and the tangential thrust T_1 at the springing hinge S. The unit load p is uniformly distributed on the horizontal plane $a\ b$, and is assumed to be transmitted vertically to the rib without constraint by vertical struts having no weight in themselves. The parallelogram $a\ b\ c\ d$ drawn to scale of the height p, and corresponding in length with the horizontal distance between A and S, is termed the *vertical load area*.

Now, consider the equilibrium of a portion of the rib from the crown hinge A to an assumed hinge at the point B, and suppose the rib between A and B to be rigid. The corresponding part of the vertical load area $a\ b_1\ c_1\ d$, shaded in Fig. 59, may be regarded as represented by the force P acting through the centre of gravity of the shaded area. The portion A B is balanced by three forces, T_o, T, and P, which must meet at one point, and the general condition of equilibrium requires T to act along the tangent at B. By lowering the shaded part of the load area until a coincides with A the tangent through B will bisect the base of the load area. If B were at any other position along the rib the same result would follow. Hence it will be seen that the condition of equilibrium of a linear arch under the vertical load area is: That the tangent at any point shall meet the crown tangent on the vertical through the centre of gravity of the portion of the load area from the crown to that point.

Conjugate Load Areas.—The curve A B S, in Fig. 59, represents a rib similarly intentionally pulled out until it is no longer parabolic and has become the quadrant of a circle. Under the previously-assumed conditions of loading the rib will not be in equilibrium; the vertical load will tend to flatten it at the crown and to spread it out further at the point B. To prevent horizontal spreading, assume a vertical platform, $e\ f$, equal in length to a radius and 1 ft. wide normal to the paper, and furnished with a load gravitating horizontally inwards. This load is indicated in Fig. 59 by the parallelogram $e\ f\ g\ h$ of the height $q = p$, standing on the platform $e\ f$ as its base. This is termed the *conjugate horizontal load area*.

Considering the whole circular rib, it is evident that the two conjugate load areas should be alike, and the proof is given as follows:—Let the quadrant A B S be rigid, with hinges at A and S. Then for horizontal component equilibrium, we have the thrust at the crown T_o equal to the horizontal load area $e\ f\ g\ h$. Again, let the part A B of the quadrant be rigid, with hinges at A and B, and resolve T the thrust along the tangent at B, into its vertical and horizontal components V and H. Then for horizontal component equilibrium we have

* "Two-nosed catenaries and their application to the design of segmental arches." By T. Alexander, C.E., and A. W. Thomson, D.Sc., Transactions of the Royal Irish Academy, Vol. xxix.

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T_o = H, together with the unshaded part, $f_1 f g g_1$, of the horizontal load area. Hence, H must be equal to $e f_1 g_1 h$, the shaded part of the same area represented by the horizontal force Q. Further, V equals the shaded part, $a b_1 c_1 d$, of the vertical load area represented by the force P. If θ be the angle of the rib at B to the horizontal, V must bear to H the ratio of sin θ to cos θ, in order that T may be along the tangent at B, as required by the general condition of equilibrium. But P and Q are in the same ratio, as the bases $a b_1$ and $e f_1$ are sin θ and cos θ, respectively, when the radius is taken as unity. Hence, when q is constant and equal to p, the condition of equilibrium is satisfied at any point B of the quadrant.

For a quadrant, horizontal at the crown and vertical at the springing, having to resist a pair of conjugate loads, one vertical and the other horizontal, the condition of equilibrium is:—That the part of the vertical load area from the crown out to any point, and the part of the horizon load area from the springing up to that point, shall bear the same ratio to each other as that of the sine and cosine of the slope of the rib, at that point, to the horizon.

Fig. 60 shows another manner of loading the quadrant A B S with a pair of conjugate loads which balance it. Here the horizontal conjugate load is *a uniformly varying load*.

The horizontal load area, represented by the trapezoid G K j H, stands on the base H j, and is set out by the 45 deg. sloping line drawn from L.

The vertical load consists of two parts. The first part is the material between the horizontal plane represented by the line D C L, and the rib A B S. The second part is a load distributed uniformly along the rib, such that the amount upon the part A B would fill up the area O A B with the material constituting the first part of the load. The first part of the vertical load on the arc A B is a slab A B C D, assumed, as before, to be 1 ft. wide normal to the paper. The second part of the vertical load may be represented by a uniform ring of voussoirs 1 ft. wide normal to the paper, and of the same material as the slab A B C D. In this case the thickness of the voussoirs must be half the radius, so that their volume may complete the slab O B C D. The trapezoid O B C D in Fig. 60 is the vertical load area for the portion A B of the quadrant and is represented by the vertical force P, while the shaded area E F G H is the horizontal load area for the portion from the springing up to B, and is represented by the horizontal force Q. In the two shaded areas the parallel sides are equal, namely B C = E F, and O D = H G, and their areas are proportional to the distances between the parallel sides respectively. Hence P : Q :: C D : H E :: sin θ : cos θ, and, as before, the conditions of equilibrium are assured.

It should be noticed that only the upper portion A B C D of the vertical load area represents the distribution of the first part of the vertical load. The area O A B merely indicates the amount of the second part of the vertical load on A B without representing its distribution. It should also be observed that the thickness of the voussoirs necessitated by the foregoing assumptions is vastly in excess of that required in actual practice.

Superposition of Loads.—If a rib be balanced under the two systems of loading separately, it can evidently be balanced under the same systems applied conjointly. The load in the latter case can be represented by a pair of conjugate load areas constructed by adding or subtracting the two given pairs of areas. Suppose the horizontal plane D C L, in Fig. 60, to be lowered until D corresponds with A, then A J representing the horizontal plane in its new position cuts off a parallelogram A J C D from the vertical load area. At the same time the new sloping boundary $j m$ cuts off a parallelogram $j m$ G K, of exactly the same area, from the horizontal conjugate load area. This is practically the same as if the load shown in Fig. 59 were removed. Conversely with the load shown in Fig. 59 may be added to that in Fig. 60. The rectangle $a b_1 c_1 d$, Fig. 59, would then be placed above C D, Fig. 60, and the rectangle $e f_1 g_1 h$, Fig. 59, could be placed against H E, Fig. 61, or distorted until its sides sloped at an angle of 45 deg., and placed against G F in the same figure.

The vertical force P, in Fig. 59, may be taken to represent the share of the live load carried by a section of a bridge 1 ft. broad. The horizontal force Q in Fig. 59, represents the additional horizontal reaction that must be opposed by the backing to any tendency of the arch to spread when the live load comes upon it.

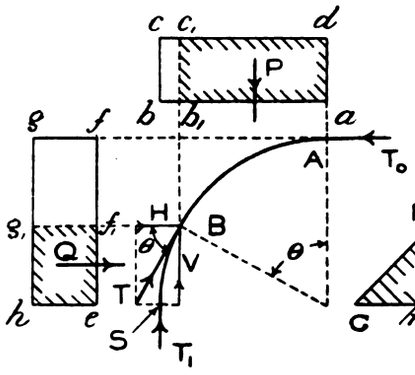

Fig 59.

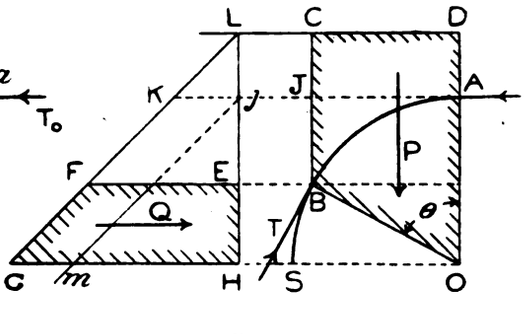

Fig. 60.

On the other hand, Fig. 60 affords a representation of the dead load on the same bridge. The platform or roadway is represented by the horizontal line D C L, while A B S is the line of stress up the middle of the voussoirs, these two lines forming the upper and lower boundaries of the greater part of the dead load. The other portion of the vertical load, spread uniformly along the line of stress, is the weight of the voussoirs, and the conjugate load area j H G K indicates, from the crown to the springing, the passive horizontal resistance which the backing must oppose to the tendency of the linear rib to spread under the influence of the dead load.

As the thickness of the voussoirs in practice would be insignificant compared with the radius, it is recommended that the whole of the area representing the load along the curve A B S should be removed, and a small proportion be restored afterwards to suit practical requirements.

The first step is to find the shape of the horizontal load area for the quadrant A B S bearing a uniform load, along the rib, of the intensity already taken. The breadth of this area should be calculated for several equidistant points on the line j H and a boundary can then be drawn with three batters accurately enough for practical purposes. The area is then to be drawn on the left side of j H so as to subtract it from the area already determined. The treble-battered line then furnishes the inner boundary of the conjugate horizontal load area, and the outer boundary is the line L K F G, the position of which changes with any variation in the height of the plane D C L, or with any alteration in the live load.

In Alexander and Thomson's discussion of conjugate load areas, the diagrams represent shafts or cylinders under fluid pressure, and special reference is made in the text to the design of buried arches, shafts, and sewers. With the object of limiting our consideration of the method, we have only dealt with such parts of the discussion as relate to arches generally, and the diagrams in the present article have been specially drawn to conform with this line of treatment.

COURT OF COMMON COUNCIL.

A MEETING of this Council was held on Thursday of last week.

The Streets Committee submitted a report in reference to the recent fatal fire in Ivy-lane, in which they recommended that they be authorised to take immediate steps for the promotion of a Bill in Parliament empowering the Corporation to inspect all buildings and require owners to provide proper means of exit through the roof by fixed ladders or other adequate means of escape.—This was agreed to.

A letter was submitted from the Local Government Board suggesting certain alterations in the by-laws under the City of London Public Health Act, 1902, in regard to the demolition of buildings which was approved by the Court in October last. On the recommendation of the Committee it was agreed that the by-laws should be amended accordingly and the necessary steps taken to get their formal confirmation by the Local Government Board.

On the recommendation of the same Committee it was decided to construct an underground convenience for men only in Fleet-street by Fetter-lane at an estimated cost of 2,300*l*., exclusive of the expense of altering any gas, water, hydraulic, or other mains that it might be found necessary to divert.

The Lord Mayor laid before the Court a request from the Mayor of Bradford asking for a loan of pictures belonging to the Corporation for an art and industrial exhibition to be held at the Cartwright Memorial Hall, Bradford, next May, and a letter from Sir Horace Plunkett, Vice-President of the Board of Agriculture, in Ireland, on the subject of exhibiting in the Guildhall Art Gallery for a brief period a collection of works representative of Irish art.—The requests were referred to the Library Committee.

A report was submitted from the Bridge House Estates Committee in regard to the suggested reconstruction of Southwark Bridge. They stated that although a satisfactory settlement had been arrived at with the Thames Conservancy Board and other river interests, and that provision had been agreed to be made for the convenience of foot passengers during the progress of the works, the opposition of the owners, lessees, and occupiers of premises at the northern end of the bridge to the proposed alteration of the level of Upper Thames-street and the gradients of the various streets and lanes affected thereby, had prevailed with the Committee of the House of Commons. Seeing that the elimination of the most important feature of the scheme left Queen-street with its present heavy gradient of 1 in 29, and destroyed the value of the scheme as a whole, they recommended the Court not to proceed with the present Bill.—This was carried.

The scheme for the barrage of the Thames from Richmond to Gravesend, published by Mr. Casey and Mr. Barber, was referred to the Port of London Committee to consider and report as to its practicability and desirability.

ROYAL COMMISSION ON LONDON LOCOMOTION.

AT the resumed sitting of this Commission on Thursday of last week the evidence of Mr. C. T. Yerkes was continued and concluded. The witness expressed himself as adverse to the building of shallow surface tramways on the ground that they would interfere with the tunnels which ought to be constructed for the accommodation of gas, water, electric, and other pipes, and also because they were more expensive to construct than the tube railway, owing to the great loss they caused to the public while the work was in course of progress. He was against municipalities going in for building railways or tramways, because they could not do it as cheaply or as efficiently as a private company. He would like to see a 2d. uniform fare throughout London, so that the working man might be able to live right out in the country, as was the case in New York, Chicago, and other American cities.

Mr. J. S. Beale, who has been honorary solicitor of the Railway Company's Association for the last thirty years, also gave evidence. He expressed himself against the appointment of a tribunal outside Parliament to deal with railway and tramway bills, as has been suggested by many witnesses, and instead advocated a joint committee of both Houses of Parliament as being an ideal body, whose decisions, he thought, would command universal confidence and respect.

On Friday evidence was given by Mr. Alderman Ivey, the Chairman of the Tramways Committee of the West Ham Borough Council. He said that, in his opinion, the fact that local authorities had not yet been able to agree on a system of electric traction for tramways or as to terms of working went to prove that there was a need for an authority with powers to settle above the heads of the parties concerned any question in dispute. He advocated a scheme of tramways for London which should take the form of a wheel, the spokes of which should cross near, but not at, a central hub, the hub being

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the City; each spoke line was to be connected by various circles of tramways. Dealing with the merits of the overhead and the conduit systems, witness said that he was in favour of the former, which, he considered, were merely the bridge which would carry us over until it was commercially possible to run trams with accumulators. When the accumulator was perfected the conduits and surface contact gear would be of no use, and it would cost more to remove them and make good the roads than the material would be worth. On the other hand, the overhead gear could be easily removed and would be worth a fair price per ton.

Sir James W. Szlumper said that he had made a special study of the underground railways of London, and considered that the time had passed for any entirely new and comprehensive scheme to be formed. A valuable addition to London's tubes would be a railway from the south end of the Great Northern and Strand railway under the Thames to Southwark, Walworth, Peckham Rye, Dulwich, and so to the Crystal Palace. The proper and more convenient size for tubes he had found to be 11 ft. 8½ in. The theory had been put forward that a larger tube would provide a means of escape in case of danger, but he considered that it would be a death trap in a case of panic. Schemes, said witness, in conclusion, should not be rejected merely on the grounds that the capital was not absolutely secured.

GENERAL BUILDING NEWS.

NEW WEST FRONT, HEREFORD CATHEDRAL.—The Archbishop of Canterbury has just dedicated the new west front of Hereford Cathedral. The new front is estimated to cost between 14,000*l.* and 15,000*l.* The complete scheme of restoration, however, will not have been carried out until another stage—the third—has been accomplished. The first stage consisted of a stained-glass window at a cost of 1,500*l.* The second is the work just completed. The third will be the renewal of the fronts of the north and south aisles, surmounted by massive turrets, with staircases leading on to the roofs of the nave. This will be taken in hand when funds permit. The central portion of the west front has been built in the XIVth century decorated style. A new narthex has been provided, and it is flanked by two buttresses, which, just above the parapet, recede, and are carried on up in the form of pinnacles of the same design as those which adorn the main tower, with the addition of the letters "I.H.S." carved at frequent intervals. Between the pinnacles, in the centre, is a Latin cross, constituting the apex of the façade, and underneath, above the memorial to the late Queen, is a canopied statue of the Madonna. On either side of the window is a statue—the one on the left being St. Thomas of Hereford, and that on the right St. Ethelbert, likewise in canopied niches. Below the parapet, which is panelled, is more statuary. On the north side of the portal is a full-length figure of Bishop Booth, and on the south side a figure, of like proportions, of Bishop Lorraine. On the large side buttresses will be placed statues of St. George and the Dragon on the English side (north), and St. David on the Welsh (south). The main arch is cusped and springs from two piers, and is decorated externally with ball flower, the cusps being lions' heads and roses alternately, while the piers are foliated with bryony and maple. The label of the arch is stopped by long bosses of ivy and bryony. The subject of the centre shield above is a crown radiant cross with the monograms of the patron saints, "S. M." and "S. E.," representing St. Mary and St. Ethelbert. Vine crockets decorate the main gable, which is crowned by a finial. In the diapers up the faces of the two small buttresses, which stand one on each side the entrance to the narthex, are alternately roses with foliage, and in one row are several symbols. There are emblems also of the Passion and a representation of the Resurrection. Above the narthex are shields copied from the Stanbury Chapel of the cathedral, including those of St. Peter, St. Andrew, St. John the Baptist, St. John the Evangelist, St. Matthias, and St. Philip. The canopies of the statues of Booth and Lorraine are crocketed, and terminate in a finial at the cornice line, which is the dividing point of the upper and lower portions of the façade. The parapet is panelled and ornamented with ball flower. On the inside of the porch the capitals are filbert oak, vine, thorn, and ivy, and the centre boss in the groined vaulting shows the ancient arms of Kings Offa and Cantlupe and the Deanery crest. The groins terminate in northern, southern, eastern, and western bosses. The panel over the inner doorway represents our Lord seated upon a throne in majesty, and in the spandrils on either side are attendant angels, the one bearing a palm and the other a lily. The label ends on the right-hand side in a figure-head of the late Archbishop of Canterbury and the present Archbishop, representations of Bishop Percival and Dean Leigh carved in stone occupying the corresponding situations on the interior wall of the doorway. The stone used is mottled Hollington (North Staffordshire), which is of a red sandstone nature, excepting the flooring of the porch, which is Portland stone. The contractors for the work were Messrs. John Thompson and Co., Peterborough; the ornamental carving was entrusted to Mr. John Baker, and the statuary to Mr. Fincher. The remaining portion of the restoration—the renewal of the west fronts of the side isles, with the addition of turrets—is estimated to cost 5,000*l.* Mr Oldrid Scott, of London, was the architect for the work.—*Birmingham Daily Gazette.*

CHANCEL, ULVERSTON CHURCH.—The new chancel of Ulverston Parish Church was dedicated on the 22nd ult. The old chancel has been extended by 14 ft. eastward, thus making the full length of the interior of the church 152 ft. A number of additional choir stalls have thus been provided. The tower at the west end has been opened out, and this has made room for additional pews. The old stained-glass window at the east end has been raised. The architects were Messrs. Austin and Paley, and the contractors Messrs. Hatch and Sons, all of Lancaster.

NEW SACRARIUM, ST. BARNABAS' CHURCH, DERBY.—A new sacrarium has been added to St. Barnabas' Church, in the Ashbourn-road district of Derby. Last autumn it was decided to finish the east end—the tower is left to the future—by the addition of a sacrarium 18 ft. long, and a choir, built into the nave, 20 ft. in length. Underneath the sacrarium is a choir vestry, with access by a stone staircase inside the church. The chancel thus formed is separated from the rest of the nave by an open oak screen. The sacrarium is lighted by three windows in the Early English style, corresponding with the architecture of the rest of the building, which was designed by Mr. Coke Hill. Its cost has been about 2,300*l.* Messrs. Walker and Slater, the original builders of the church, have carried out the new additions. The oak work has been designed and executed by Messrs. Jones and Willis, of Birmingham; the vitreous mosaic floor of the chancel, coloured in green and peacock blue, has been put in by Messrs. Rust, of London.

NEWMAN MEMORIAL CHURCH, EDGBASTON, BIRMINGHAM.—The foundation-stone of the Newman Memorial Church was laid on the 25th ult. by the Roman Catholic Bishop of Birmingham. The plan and main features of the memorial church are based on those of the Church of San Martino in Rome—chosen because the Cardinal had always intended that such a church should be erected at Edgbaston. For this purpose he caused an exact ground-plan and elevation of San Martino to be made for him in 1850. In selecting therefore San Martino as their model for the memorial church, the Fathers are carrying out the Cardinal's intentions, though the design has of necessity been modified to suit modern requirements. Hence, in the new plans there are transepts and a spacious sanctuary; while a barrel roof and dome have been substituted for the flat roof of San Martino The nave will consist of seven bays, with side aisles and epsidal side chapels opening from the aisles. The interior walls of the church will be left for the present for future decoration, and the side aisles will be vaulted in stone. The width of the nave will be 33 ft., and the barrel roof will be made of chestnut wood. The columns supporting the entablature will be of Brescia marble, each column measuring 18 ft. in height and 2 ft. 1½ in. in diameter. The floor will also be of marble. The internal stone-work will be of Guiting stone, and the external walls of Stancliffe stone. The building will be an entirely new structure, which will be erected outside and over the present edifice. For a time the extensions proposed on the chancel side of the church will be deferred. The total cost will probably be 30,000*l.*, and, so far, little more than half that amount has been raised. Roughly speaking, the cost of the work now proposed is 14,000*l.* Mr. Doran Webb is the architect of the new church.—*Birmingham Daily Post.*

NURSES' HOME, YORK COUNTY HOSPITAL.—A new nurses' home has been erected at the York County Hospital. The home is in the form of a new wing, projecting at right angles to the main building, and at the end of the Watt Memorial wing. The principal front faces St. Maurice's-road, from which it is intended to have a separate approach when the whole scheme is complete. It is connected with the Hospital by a paved and glazed covered way which faces south to the garden, and which provides a promenade for the nurses. The present section contains sitting and day rooms for the sisters and nurses, separate bedrooms for the matron and twenty sisters and nurses, maids' pantry, cloak-rooms, box-room, four bath-rooms, coal and luggage lift, and other necessary conveniences. The building is of three stories, and is of fireproof construction. The staircases are of stone, the floors of concrete covered with mosaic or wood blocks, and the walls and ceilings are plastered with fireproof cement. The building is warmed by low-pressure hot-water from a steam heater, supplied from a large new boiler recently placed in the basement of the main building, besides which every room has a fireplace. Electricity has been employed for lighting. The work has been carried out by the following York contractors:—Brick and stone work, Mr. George Walker; joinery, Messrs. Hick and Hobson; slating, Messrs. Dodgson and Son; heating and plumbing, Mr. T. G. Hodgson; painting, Messrs. Bellerby and Sons; electric lighting, the York Electrical Company. The cost has been about 4,000*l.*, which, with furnishings, brings the total to 4,486*l.* Several other works have also been carried out at the Hospital, including improvements to the operating theatre and the provision of fire-escape staircases and balconies. The balconies and staircases are constructed of steel and concrete, with hammered iron balustrades. Prismatic glass floors have been used for the ground-floor balcony, so as not to interfere with the lighting of the basement. The work has been carried out by Mr. W. Tomlinson Walker, of Victoria Ironworks, York, assisted by other local contractors, and the cost has been about 1,400*l.* An electric passenger lift has also been provided near to the front entrance, extending from the basement to the top story. The car is sufficiently large to take an ambulance, and the motive power is electricity. A space is also formed in the car for carrying coal, food, boxes, etc. The elevator was provided and fixed by the Otis and Waygood Elevator Company, and the total cost was 750*l.* The works have been executed from the designs and under the supervision of Mr. Walter H. Brierley, architect, of York.

SANATORIUM, SCARBOROUGH. — This new building has been erected on a site to the north of the borough and outside the boundary, at a distance of two miles from the centre of the town. It is 165 ft. above ordnance datum, and can be approached from either the Scalby or Burniston roads. The administrative block contains accommodation for Medical Officer of Health, matron, nine nurses, six servants, kitchen for the whole hospital, and the usual offices. The scarlet fever block has accommodation for six male and six female patients in main ward and for two patients in private wards. A recreation-room is provided on the first floor. The enteric fever block has accommodation for four male and four female patients in main wards and two patients in private wards. The diphtheria block consists of the wood and iron structure erected in 1892 for the isolation of small-pox. The observation block has accommodation for one male and one female patient. There are also laundry block, wash-house, ironing-room, engine-room, boiler-house, coal-house, disinfecting chambers stable and coach, mortuary, and incinerator. The porter's lodge and discharge block includes accommodation for porter, and waiting-rooms, bath-room, dressing-room, clothes store, and the usual offices. The buildings are of brick, with stone dressings, faced with local red wire-cut bricks, and slated roofs. The wards of the scarlet fever, enteric, and observation blocks are heated by means of Shorland's Manchester stoves and grates (double stoves being provided in each of the large wards of the scarlet fever and enteric fever blocks). Supplementary and independent heating is provided in these two pavilions and in the administration blocks by means of radiators on the low pressure hot-water system. Each pavilion is also provided with a separate system of hot-water supply. All wards are ventilated by means of inlet ventilators at the floor level and by exhaust ventilators in the ceiling on the "natural system." In addition, the upper portions of all the windows are arranged to open inwards on the hopper principle. The wards are lighted by means of incandescent gas burners. The floors of the wards consist of polished oak blocks on concrete. The floors of the duty-room, recreation-room, and nurses' dining-room, and first-floor corridor in the administrative block are of polished pitch pine. The floors of the corridors, wards, bath-rooms, lavatories, etc., are of terrazzo. The cooking for the whole institution will be carried out in the kitchen of the administrative block. The laundry has been fitted with up-to-date steam power plant. The whole of the work has been designed and carried out under the supervision of the Borough Engineer (Mr.

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Harry W. Smith), in conjunction with the Medical Officer of Health (Dr. F. Dittmar). The following were the contractors for the various works:—Excavator, bricklayer, and mason, Messrs. J. Bastiman and Sons; slater, Mr. C. Pullan; carpenter and joiner, Mr. T. B. Jowsey; plasterer, Mr. J. Turnbull; smith and founder, Mr. H. Pickup; painter, Mr. R. Kelly; plumber and glazier, Mr. S. Bland; laundry machinery, Messrs. Bradford and Co., of Manchester; heating and hot-water apparatus, Messrs. Blakeborough and Rhodes, Stockton-on-Tees; Manchester stoves and ventilation, Messrs. Shorland and Brother, Manchester; wood block and terrazzo flooring, Messrs. Geary, Walker, and Co., London; clerk of works, Mr. W. H. Walden.

POST OFFICE, ILKESTON.—New Post Office premises have been erected at Ilkeston, in the Market Place, from plans prepared by Mr. C. Hunt, architect, Ilkeston. The contractors for the building were Messrs. Hazlewood and Marston.

GUARDIANS' OFFICES AND NURSES' HOME, LAMBETH.—Mr. George Howlett, Chairman of the Lambeth Board of Guardians, opened recently the new Nurses' Home and Offices, situated in Brook-street, Kennington, on the site of the old board room. Negotiations and work in connexion with the new building have been in progress for some three or four years. The Nurses' Home will accommodate over 100 officers, each having a separate bedroom. Mr. S. R. J. Smith was the architect and Mr. W. Lawrence the builder.

NEW DWELLINGS, LIMEHOUSE.—The new dwellings which have been erected in Three Colt-street, Limehouse, were opened recently by Alderman Potter. The buildings provide accommodation for fifty-six persons. Mr. A. E. Symes, of Stratford, was the contractor for the work, and Mr. W. M. Jameson, the Borough Engineer, the architect. The cost of the work was 6,298*l*.

SCHOOLS, WALTHAMSTOW.—The new schools at Selwyn-avenue were formally opened on Saturday, the 19th inst., by Councillor Edward Good. The accommodation is for 520, in two departments. The contract amounted to 7,092*l*. The building was erected from designs by Mr. H. Prosser, Architect to the Education Committee, and is faced with Adderley-park red pressed bricks, with string courses of Ruabon white pressed bricks, and dressings of Box-ground Bath stone. There are ten class-rooms, eight of which will accommodate fifty, and two rooms of sixty each. These are grouped around the central hall, which is 85 ft. 6 in. by 26 ft., and can be divided by a movable glazed partition. There are five entrances, large cloak rooms, head teacher's room, assistant teachers' room, lavatories, book-store, caretaker's store, &c. The dados are of glazed bricks throughout. The galleries are sloped instead of stepped, the floors are laid with pitch-pine blocks, and the heating apparatus is on the low-pressure system. Mr. F. J. Coxhead, of Leytonstone, was the contractor.

THE LAW SOCIETY'S NEW BUILDINGS.—Their Majesties the King and Queen, opened on Wednesday the new wing of the Law Society, Chancery-lane. Mr. H. Percy Adams, the architect, has produced something much more interesting than the existing buildings. A new vestibule and staircase, leading to the rooms on the first floor, are close to the present main entrance, the vestibule also giving access to a refreshment-room and smoking-room. In the latter room is a frieze of decorated panels of oil-painted flowers. The president has a separate room, whilst a general office, and rooms for the secretarial and clerical staff are in close proximity. The public will obtain an entrance from Bell-yard. The new hall is situated on the first floor. The frieze consists of thirteen panels, joined by festoons of leaves and fruit. They are original models by Mr. Conrad Dressler, and are fired in clay and enamelled in various colours. The conception of the whole is Justice exhibited in the Divine and human aspects. A room has been provided as an addition to the library. The examination hall will in future be used as a students' reading-room, as well as for its original purpose. Examinations, lectures, and classes will henceforward be held in two rooms on the third floor. These apartments will be reached by a lift, or by the staircase at the Bell-yard entrance. The contractors for the whole work were Messrs. Colls and Son, of Coleman street.

STAINED GLASS AND DECORATION.

RESTORATION OF YORK CHAPTER HOUSE WINDOWS.—The work of preserving the stained windows of the Chapter House of York Minster has been taken in hand by the Minster authorities. It is some time ago now that Mr. G. F. Bodley, R.A., the adviser of the Dean and Chapter, drew attention to the dangerous condition of the windows owing to the fact that long exposure to the atmosphere had so affected the surface of the glass, by corrosion, that in some parts the thickness of the plate had been reduced from an eighth of an inch to almost the thickness of paper. As a result of his report it was decided, in order to prevent further ravages and the possibility of the windows being blown in, that steps should be taken to protect them. This is being done by the erection of an outer covering of plain glass, in quarries. It is also intended to repair portions of the worn mullions. Something over 500*l*. is the estimated cost of the work.—*Yorkshire Observer*.

MEMORIAL WINDOWS, STAFFORD. — Two stained-glass memorial windows were recently unveiled in St. Thomas's Church, Stafford. Messrs. Kayll and Co., of Leeds, designed and executed the work.

HORNDON-ON-THE-HILL.—A two-light stained-glass memorial window, executed by Messrs. Percy Bacon and Brothers, has just been placed in this church. The figures in the designs are those of David and Solomon, and an angel is introduced in the top of the window over these two lights holding a curtain, which forms an effective background to the figures.

APPOINTMENTS.

A MEETING of the Archdeacons and Rural Deans of the Diocese of Llandaff, presided over by the Bishop, was held at Cardiff recently, when Mr. G. E. Halliday was re-elected Surveyor under the Ecclesiastical Dilapidations Act, 1871, for the Archdeaconry of Llandaff, and Mr. W. H. Dashwood Caple, architect, Cardiff, was elected Surveyor for the Archdeaconry of Monmouth, in place of Mr. J. P. Seddon, retired.

APPOINTMENT OF SANITARY OFFICER.—The Local Government Board has sanctioned the appointment of Mr. W. Peverett as a sanitary inspector in the Metropolitan Borough of Hackney.

Mr. G. Hamilton Gordon, A.R.I.B.A., has been appointed by the Secretary of State for the Colonies to the post of Director of Public Works for the Orange River Colony, and is shortly leaving for South Africa.

FOREIGN.

FRANCE.—The Société Nationale des Architectes de France has chosen for the subject of its competition for 1904 "A design for a bathing and hydropathic establishment."——A statue representing "The Republic," by M. Constant Roux, has been placed in the courtyard of the Prefecture at Marseilles.——The statue of Mariette Bey, the celebrated Egyptologist, has been inaugurated at Cairo. It is the work of M. Denys Puech, and has a pedestal in the form of an antique sarcophagus, designed by the architect Edouard Mariette, the brother of Mariette Bey.——A museum of Southern French art is to be established at Montpellier, which will contain remarkable examples of sculptural art from the IVth to the XIIIth century, and will present opportunities for the study of the mediæval art of Languedoc, Roussillon, Provence, Dauphine, and Auvergne.——M. Bonnat has been elected a member of the Conseil Supérieur of the Ecole des Beaux-Arts, in place of the late M. Gérôme.——The Department of Instruction Publique has founded a new school in the Boulevard Montparnasse, built from the designs of M. Lacoste.——The Service des Beaux-Arts of Paris has installed in the basement of the Petit Palais the curious collection of models of public roads exhibited in 1900 in the "Exposition de l'Art Public."—The death is announced of M. Arthur Chaudonet, architect, of Dijon, at the age of fifty-seven. Among his principal works were the Lycée Carnot at Dijon, the Ecole d'Agriculture at Chatillon, and the Mont de Piété and the Savings Bank at Dijon. He was architect to the Department of the Côte d'Or.——The death is also announced of the architect Jean M. Benoni Roblot, curator of the museum at Sens.——We have to record, also, the death, at the age of forty-one, of M. Paul Signac, one of the most remarkable of the group of painters who were distinguished as "néo Impressionistes." He was the author of a work entitled "D'Eugène Delacroix au Néo-Impressisme," in which he stated the theories of this group of artists.——We have also to record the death, at the age of fifty-two, of a much esteemed writer on art, M. Germain Hédiard, who had made a special study of French masters in lithography. He also wrote, for *L'Artiste*, a series of excellent critical studies of various artists—Delacroix, Bonington, Decamps, Charlet, Paul Huet, Dupré, J. Lewis Brown, Fartin-Latour, etc. He had in preparation others, for the *Gazette des Beaux-Arts*, on Géricault and other artists, and had taken an active part in the organisation of the retrospective exhibition of lithography.

GERMANY.—A new opera house is to be built in Berlin from the plans of Professor Genzmer. ——The Physical Society at Frankfort is about to build a Physical Institute from the plans of Herr Hoven, at a cost of 1,250,000 francs.——The Harbour at Düsseldorf is to be rebuilt and charged at a cost of 8,000,000 francs. ——A new theatre is to be built at Kiel from the designs of Herr Seeling.

AUSTRIA.—A memorial to the composer Millöcker has been erected in the central cemetery at Vienna. The sculptor, Herr Josef Tuch, has represented on one side a bust in relief of the composer, and at the foot a scene from the second act of the operetta "Der Bettelstudent," Millöcker's most popular composition. The memorial is executed in Carrara marble.——The plans for a Thermo-chemical Institute at Budapest have been completed; it is estimated that the building will cost 2,000,000k.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —Mr. Thompson, architect, Hull, has entered into partnership with Mr. Kirton, and the practice will be carried on under the style of Thompson and Kirton. The offices have been removed from Manor-street to Exchange-buildings, Lowgate, Hull.——Mr. S. H. Healing, of Gloucester, and Mr. T. Overbury, of Cheltenham, architects and surveyors, have entered into partnership and taken over the offices and architectural practice of Mr. Joseph Hall, late Borough Surveyor of Cheltenham, at Lloyds' Bank-chambers, Cheltenham.——Mr. M. Starmer Hack, architect, has removed his offices from 28, Newman-street, to 22, Surrey-street, Strand, W.C.

EDINBURGH BUILDING TRADES' EXCHANGE.— On the 24th ult. Mr. William Graham Yooll, the President, gave a short address on the history and manufacture of cement—Mr. D. W. Kemp, J.P., presiding—remarking that unless British manufacturers adopted modern machinery and scientific methods, as was done abroad, their occupation would soon be *non est* as far as England was concerned. There was no reason why, with cheap coal at hand, works of modern construction should not be erected and carried on in a manner that would bid defiance to any foreign competition, which was undoubtedly becoming a very serious matter. But, he said, the increase of imports must not be met by taxation, or, still worse, by adulteration of material, but by the methods he had indicated. At the close Mr. Graham Yooll was awarded a cordial vote of thanks.

NORWICH MASTER BUILDERS' ANNUAL DINNER. —The members of the Norwich and District Master Builders' Association held their annual dinner on the 23rd ult. at the Maid's Head Hotel, when upwards of one hundred gentlemen connected with the building industry in the city assembled. The chair was occupied by Mr. James S. Smith, in the regrettable absence, through indisposition, of the newly-elected President, Mr. John Youngs. The loyal and patriotic toasts having been honoured, Mr. W. T. Scarles submitted "The Norwich and District Master Builders' Association." The Association was started on November 2, 1897, under the auspices of Mr. George Hawes, to whom in the early stages of the Association they owed a great deal. For the last two years they had been under the guidance of their present chairman, Mr. Smith, than whom no man was more respected in Norwich. The Association had not done much during the past year, for the reason that there had not been much for them to do; but he was sure that when their services were required the members would do all in their power to make the Association a strong one. The Chairman, in reply, stated that he thought the building trade, taken collectively, was the largest industry in the kingdom. The membership of their Association represented the payment of 100,000*l*. in wages a year, which, he thought, justified their position. They endeavoured to settle all disputes between master and men, to aim at fair and equitable forms of contract, and to exchange social ideas. They felt there was a great advantage in a uniform contract, and if there was such a form of contract there would be no need to waste time in reading contracts through, as they would be universally understood. In connexion with the Association was an accident insurance society, and already they had dealt with some ninety-two claims, some light and some serious. They had managed to treat the Accident Association as a going concern. There had also been recently started another branch of business, a fidelity guarantee society, whereby they could guarantee any employee who might want references as to a situation. Beyond that, they had formed a builders' contract guarantee, which should commend itself to builders, because

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very often they were asked to sign a contract and find a bond. In such cases the Association was willing to accept any guarantee for any builder who might accept a contract. He trusted that builders from all parts of the county would avail themselves of the benefits offered by the society.—The toast of "The Mayor, Sheriff, and Corporation" was proposed by Mr. G. E. Hawes. The Sheriff and Alderman Cunnell responded. Mr. G. S. Tinkler proposed the toast of "The Architects and Surveyors," which was acknowledged by Mr. E. T. Boardman, who suggested that the Association should found a scholarship at the Technical Institute, which would lead to good work on the part of the students. Mr. A. E. Collins, the City Engineer, also replied, and remarked that during the year the builders had not been so much trouble to him as in previous years. That was, however, owing to the slackness of work in the city. Mr. B. B. Morgan, whose name was coupled with the toast, also replied. Mr. F. A. Bainbridge proposed the toast of "The Merchants of Norwich," which was acknowledged by Messrs. E. Ransom and F. C. Havers, and the remaining toast was that of "The Guests," given by Mr. W. E. Bird, jun., and responded to by the Mayor of Ipswich and Mr. A. Brittain.

THE WIDENING OF LONDON BRIDGE.—The widening of London Bridge, undertaken two years ago, has been completed, and on Monday public traffic was resumed at the close of a brief civic ceremonial. Before the present improvement the roadway was a trifle more than 53 ft. wide, but it is now 65 ft. No change has been made in the carriage-way, which still permits four lines of vehicles to pass simultaneously, the greater width secured by the improvement being devoted entirely to the footpaths, each of which has been increased from 9 ft. to 15 ft. This enlargement is effected by means of Cornish granite corbels or cantilevers. The work was designed by Mr. A. Murray, the present City Surveyor, and carried out by Messrs. Pethick Brothers.

WALTHAM ABBEY CHURCH.—A compromise has now been arrived at with respect to the restoration of the tower of Waltham Abbey's historic church. The original proposal was to have a battlemented parapet, with pinnacles, but after a considerable sum of money had been subscribed, objection was raised in certain quarters to this method of repair, it being urged that the restoration should be carried out without any alteration in the shape of the fabric. Amended plans have now been adopted which are regarded as a compromise, showing the tower battlemented, with turrets corresponding to the existing buttresses. They were submitted to the approval of the subscribers, nearly all of whom expressed their agreement with them. As soon as it is known that sufficient money will be forthcoming a faculty is to be applied for to enable the work to be carried out.—*Standard.*

DEMOLITION OF BUILDINGS IN THE CITY.—The Local Government Board has revised the by-laws proposed by the City Corporation in respect to the demolition of buildings within the City of London. In the future no person will be allowed to pull down any building unless all windows in the external walls from which sashes and glass have been removed are boarded up, unless a gantry is constructed, the upper portion of which is boarded in to the full height of the building to be demolished. He must, as far as practicable, cause the internal partitions of such building to be pulled down story by story before beginning to take down any of the external walls of the respective stories, while canvas, boarded, or other suitable screens or mats are to be placed wherever necessary to prevent nuisances arising from dust. The constant sprinkling of materials with water is to be enforced. No ceiling is to be broken down, or mortar shot or allowed to fall into any basement between the hours of 10 a.m. and 6 p.m. on any day except Saturday, nor between 10 and 2 o'clock on Saturday. That rule will not apply in the case of any building or part of a building which is not within 20 ft. of a public way. Provisions are also made for the abatement of nuisances arising from the carting of materials away from buildings in the course of demolition, unless special arrangements are made for the protection of the public.

INSTITUTE OF ARCHITECTS AND L.C.C. DRAINAGE BY-LAWS.—Kensington Borough Council considered on Tuesday a letter from the Royal Institute of British Architects suggesting the modification of the by-laws recently made by the London County Council with regard to the deposit of drain plans by provision being made therein for the acceptance of a block plan, with levels and gradients properly marked thereon, and a written description of pipes and apparatus above and below ground in lieu of the complete duplication plans specified in the said by-laws. Upon the recommendation of the Public Health Committee, it was resolved to send a communication to the London County Council expressing concurrence in the views put forward by the Institute.—Deptford Borough Council on Tuesday concurred in the opinion of their Works Committee that the by-laws in question were of a very drastic character and should be modified. The Town Clerk was instructed to write to the L.C.C. to this effect. Stoke Newington Borough Council decided to inform the L.C.C. that it favoured some modification in the by-laws in the direction indicated in the Institute's letter. The Borough Councils of Battersea, Poplar, Bethnal Green, and Lewisham have declined to take action in the matter. A large number of the Metropolitan local governing bodies have not as yet come to a decision.

LIVERPOOL MEMORIAL TO MR. GLADSTONE.—A meeting of the executive committee was held at Liverpool Town Hall on the 28th ult., the Lord Mayor (Alderman Hampson) presiding. Mr. Holt informed the committee that the statue of Mr. Gladstone, executed by Mr. Thomas Brock, was completed and about to be delivered in Liverpool, and that it would be placed in position by the beginning of June. The committee approved the inscription.

Legal.

CASE UNDER THE LONDON BUILDING ACT.

AT Southwark Police-court on March 25, before Mr. Paul Taylor, Messrs. F. E. and G. Maund and Mr. W. Shepherd were summoned by Mr. Bernard Dicksee, District Surveyor for Newington and part of St. George's, Southwark, for commencing work at 13, Bermondsey New-road (now Tower Bridge-road) without having previously given notice as required by Section 145.

The facts of the case were as follow:—The building is a shop and dwelling, one of a row now being built by a Mr. Perry. This house had been let to Mr. West, who had employed Messrs. Maund to insert the shop-front, and Mr. Shepherd to erect a brick wall on the flank, closing up the opening originally intended for the shop-front to less than one-half.

Mr. Dicksee contended that these works came within Section 145, being either an alteration or other work under Clause (*a*), or there had been a change of builder under Clause (*c*), in either of which cases notice should have been given.

Mr. Paul Taylor fined each defendant 10s. and 2s. costs.

COMPENSATION FOR INJURY TO HOUSES.

MR. JUSTICE CHANNELL, in the King's Bench Division, on the 24th ult. concluded the hearing of the case of Robertson *v.* The City and South London Railway Company, an action by the plaintiff, Mrs. Robertson, to recover from the defendants 271*l.* 10s., the amount awarded to her by a Sheriff's Jury, as compensation for damage done to her premises by the company in the course of the construction of its undertaking. The short facts were as follows:—Mrs. Robertson held leases of Nos. 83 and 84, Moreland-street, and No. 276, City-road, and the railway company, in the course of the construction of its works under its special Act, injured the plaintiff's premises. The parties endeavoured to arrive at a settlement as to the works to be done and the compensation to be paid by the company in making good the damage done, but, notwithstanding that some agreed works were carried out by the company, the parties were unable to agree on certain matters. On April 20, 1903, the plaintiff served defendants with a notice under the Lands Clauses Consolidation Act, 1845, claiming from them the sum of 270*l.* as compensation for the damage she had sustained, and, in the event of the defendants being unwilling to pay that sum, requiring that the compensation should be assessed by a jury. At the same time the plaintiff served the defendants with particulars of her claim, and amongst the items she claimed 25*l.* for damage by depreciation in value of No. 84, Moreland-street. On May 23 the defendants, under the Act, formally offered the plaintiff as compensation 150*l.*, which the plaintiff declined to accept. The matter thereupon went before the Sheriff's Jury for the assessment of the compensation, and during the proceedings there the plaintiff alleged that she had made a mistake in claiming only 25*l.* in respect of the depreciation in value of No. 84, Moreland-street, and put forward a claim for 50*l.*, in respect of that item. The jury, in respect of that item, awarded the plaintiff 50*l.*, and assessed her damages on the whole claim at the sum of 271*l.* 10s., being 1*l.* 10s. in excess of the total sum claimed. The Sheriff gave the plaintiff judgment for the amount, and the plaintiff brought the present action to enforce the judgment. The defendants, amongst other things, contended that as the plaintiff had by her notice claimed a specific sum for the depreciation in value of the house in Moreland-street, she had no right to afterwards put forward before the jury a claim for a larger sum in respect of that item of damage, and that the jury were not entitled to award the plaintiff a sum in excess of the total amount originally claimed.

At the conclusion of the arguments of counsel his Lordship, in giving judgment, said there was nothing in the statute which said that when a jury thought a claimant was entitled to more than the amount claimed in respect of a subject matter brought before the notice of the company they might not award him more than he had claimed, if they acted reasonably. He was quite satisfied that there was no principle which prevented a jury when a claimant had split up his lump sum into items from giving more in respect of any one item than was actually claimed for that item, provided they did not exceed the whole sum claimed. He had rather more doubt as to whether the jury could give more than the total amount claimed, although he was of opinion they could. He thought in these circumstances the plaintiff would be wise in accepting a judgment for 270*l.*

The plaintiff agreeing to do so, judgment was entered for her for that sum with costs.

Mr. Colam appeared for the plaintiff, and Mr. Courthorpe-Munroe and Mr. Langston for the defendants.

ACCIDENT THROUGH A DEFECTIVE BALCONY.

THE case of Tredway *v.* Machin came before Mr. Justice Grantham and a common jury this week—an action by the plaintiff and his wife, the tenants of the defendant of certain rooms in Sidmouth-street, Gray's Inn-road, to recover damages for personal injuries sustained through the alleged negligence of the defendant.

Mr. Cannot appeared for the plaintiffs; and Mr. Clive for the defendant.

The plaintiffs' case was that they took three rooms on the first floor in Sidmouth-street at 10s. 6d. a week rent. On the evening of August 1 last year Mrs. Tredway heard the bell, and, thinking it was her husband, she went on to the balcony outside the window to see. She looked down and turned to come back, when the floor of the balcony gave way and she fell through to the front steps and sustained a fractured thigh. She was taken to the hospital and remained there seventeen weeks, and now her leg was permanently injured. After the accident the balcony next door was taken down, and subsequently the Borough Council's surveyor ordered the others in the street to be removed.

Defendant in his defence said that when he acquired his houses repairs were done to them, by order of his surveyor, to the extent of 200*l.* The cement on the balcony had worn through, and it was repaired. Defendant said he could not account for the accident.

In the result the jury awarded plaintiff 150*l.* damages.

His Lordship held that there was no evidence of notice to the landlord of any defect causing the accident, but he would, on the verdict of the jury, enter judgment for the plaintiffs, and leave the defendant to go to the Court of Appeal.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

2,397 of 1903.—J. LONG: *Locks or Latches for Doors and Windows.*

A lock or latch, consisting in the combination with a locking bolt, of a slide so coupled to the bolt that, while the bolt cannot move independently of the slide, the slide is capable of being slid at right angles to the throw of bolt and of entering into engagement with an abutment or slot so as to lock the bolt immovable either in the locked or unlocked position.

4,587 of 1903.—A. ROBERTS: *Apparatus or Mechanism for Use in Operating or Working Tile Presses.*

The construction of a grooved or channelled driving pulley having one end of a metallic pin fixed in it and its opposite end projecting into and slidable in a slot formed in a metallic block or nut fitting on or around a screw of a tile press; a metallic spring above and a similar spring beneath the web of such

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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driving pulley, which are kept in position by upper and lower metallic collars or plates, secured by one or more metallic set pins or bolts in each collar, to screw above their upper transverse beam, for use in combination with the driving mechanism when making tiles from "dust" and semi-plastic or plastic clay or like material.

4,684 of 1903.—P. MATHIAS: *Heating Apparatus or Fireplaces.*

A heating apparatus, stove, or the like, consisting of an arrangement in which the draught passes through various flues, and in which the orifice of the said flues is closed by means of an easily-interchangeable top-piece, which top-piece is provided with an opening, and encloses a space between its walls and the walls of the flues, through which space the draught of air from the flue or flues around the combustion chamber encounters the draught coming through the flue from the combustion chamber, so that by the alteration of the form of said top-piece a consequent increase or decrease of the opening in said top-piece and of the space around said top-piece respectively is obtained and the amount and force of the draught is regulated.

4,998 of 1903.—T. J. F. RYLAND: *Dovetailing Machine.*

A dovetailing machine, in which is provided an attachment comprising a frame provided with a compound sliding carriage, said carriage having a spring-controlled catch and adjusting screw, radially-mounted plates having narrow and wide notches cut therein of various sizes for engaging with said catch, means for retaining said plates in the desired position for use, and means for cramping the wood or the like during the operation of dovetailing.

4,999 of 1903.—T. J. F. RYLAND: *A Wood-carving Machine.*

A wood-carving machine, comprising a frame supporting a table and a pair of wheeled guides or carriages, a rise and fall cross-beam borne by said guides, and supporting on a rod or runner an adjustable balanced frame, one or more rotating spindles and a pointer attached to said frame, and means for driving said spindle or spindles.

5,000 of 1903.—T. J. F. RYLAND: *Graduated Fluting Machines for Wood, Stone, or Metal.*

A graduated fluting machine, consisting in the combination therewith of an attachment comprising a base plate having, adjustably mounted on a guide formed thereon, frames or guides forming bearings for a spindle and a threaded spindle adapted to support a leg, pillar, or other work therebetween, with or without the assistance of a cup or socket, screwed on the threaded spindle, said spindle having a plate fixed thereto, provided with one or more series of holes for adjusting the rotation of the work, a spring-controlled pin or catch mounted in a bracket being arranged to engage with said holes alternately or otherwise, with a fence or guide for controlling the fluting operation, comprising a pair of plates adjustably connected to a grooved base plate and provided with adjusting screws and guide stops, said plate being pivotally connected to a pair of rods adjustably mounted by screws in supports connected to slotted links adjustably connected to said base.

5,803 of 1903.—L. SCHLENTHEIM: *Steps for Stairs.*

According to this invention, instead of making steps of the usual form—that is to say, with a plain or tabular tread—the tread is made with a shallow depression or recess, having vertical or nearly vertical side walls and a level bottom, and within this recess sheets of linoleum, carpet, or the like are inserted. In some cases, instead of making the recess with four side walls, the recess is continued forwards to the nose of the step, so that the recess has now but three walls—one at the back and one at each side. In some cases the riser is provided with a similar recess, but in that case a plane of the recess is vertical. Linoleum, carpet, or the like, may be fixed in the recess by cementing to the bottom or otherwise, as may be convenient.

8,772 of 1903.—J. B. LELEU: *Windows.*

This invention relates to windows of the type which swing either inwardly or outwardly, and are generally known as French windows. The invention has for its object to overcome the serious defects of most present-day windows, viz., lack of watertightness. It consists of a window having a rising frame actuated by a pivoting hand lever, which acts on a transverse shaft; the latter by means of cams causes the window to slide and to rise. The window can thus be lifted before being opened.

9,175 of 1903.—G. SOUTHERN: *A Portable Apparatus or Appliance for Use as an Asphalte Heater or as a Sand Dryer, or for Other Heating and Drying Purposes, in Connexion with Constructional or Repair Work.*

This consists of a portable tank or chamber having a fire box or grate and an internal flue in connexion with said grate, said internal flue communicating the products of combustion to a second flue, the outer wall or walls of which act as a drying surface or surfaces and outlet means from said flue.

9,489 of 1903.—G. J. BODY: *Joiners' Ploughs.*

This invention relates to improvements on a former invention, for which Letters Patent were granted dated October 5, 1901, numbered 19,915, and is designed to enable a plough attachment to be removed from the wooden plough and utilised as a general tool for joiners. For the purpose, connected with this plough attachment is a block to which a short plane iron, skew, or square can be secured for use on ploughs to act as a fillister. When detached a wooden handle may be fixed for use on bench, making it a shoulder and chariot plane.

9,520 of 1903.—J. VERNON and S. J. YOUNG: *Syphon Flushing Cisterns.*

This invention relates to syphon flushing cisterns, but more particularly to such as are known as bell syphons, and has for its object to facilitate the syphonic action by providing an auxiliary means for the escape of air contained in the flushing pipe. To accomplish this an air escape pipe or like conduit may be connected to the flushing pipe communicating with the interior, and to carry it up the side of the cistern above the water level. Preferably this conduit is cast upon the side of the cistern, either inside or outside, as may be most convenient, or alternatively it may be made, or a portion of it may be made, of separate piping, and it may be attached to the flushing pipe, either inside or outside of the cistern. This means of escape for the air near the upper end of the pipe promotes and hastens the charging of the syphon.

9,866 of 1903.—W. TAYLOR: *A Stone Dressing or Surfacing Machine.*

A machine for surfacing or dressing stone, consisting of a main cutting disc, an auxiliary disc cutting in an opposite direction or towards the main cutting disc, a trolley or carriage to carry the stone, and gearing to drive the cutting discs and to actuate the trolley.

9,885 of 1903.—G. P. WALLIS: *Mixers Applicable for Mixing Materials for Making Bricks.*

A mixing apparatus, consisting of a revolving drum of polygonal section, having curved sides, and divided transversely into two or more parts, a hopper situated above said revolving drum and divided into compartments corresponding to the parts of the drum, a circular enlargement in said hopper enclosing said drum, which revolves therein, so as to imprison a certain quantity of material between its concave sides and its casing, until the edge of each side passes the bottom of said circular enlargment, movable sliding plates attached to each side of one section of the drum and fitting said circular enlargement of the hopper, a receptacle below said drum, and suitable revolving mixing blades in said receptacle.

9,955 of 1903.—C. T. JOHNSON: *Means for Securing Pipes to Walls.*

Instead of the ordinary lugs or ears set out in the line of a tangent to the circle of the pipe, thereby bringing the pipe into contact with the wall, what may be termed wing brackets are provided, extending from the body of the pipe and terminating in lugs or ears, the brackets being preferably splayed out as they extend from the pipe, and terminating in lugs or ears set in line, to suit the face of a flat wall, or to such angular deviation therefrom as may be required to suit the wall at the points of connexion. These wing brackets may be cast on to the pipe as ordinary lugs are, or be loose and connected to the pipe by a strap or belt, which fits the pipe so as not to slip the socket, thereby utilising the socket enlargement as a means for supporting each length of pipe from the brackets which secure it to the wall.

10,283 of 1903.—J. TAYLOR: *Automatic Fire Extinguishing Apparatus.*

Automatic fire extinguishing apparatus employed in connexion with sprinkler installations wherein the distributing pipes carrying the automatic sprinklers are charged with atmospheric air or other fluid under pressure for the purpose of excluding water from the installation until the pressure in the distributing pipes escapes through the opening of one or more of the automatic sprinklers connected thereto, consisting of a water valve or valves held closed—by pressure in the system—against its seat or seats and against the water pressure in the main supply pipe by means of the lighter pressure of atmospheric air or fluid in the distributing pipes of the sprinkler installation, and the means for withdrawing the said water valve or valves—whether a spherical, flat, or other convenient form or shape—from its fixed, movable, flexible, or yielding seat or seats disposed in the water or other liquid passage, and in such a manner that when the valve or valves is open to a free and unobstructed passage for water or other liquid through the valve box will be effected and water "columning" prevented.

10,565 of 1903.—H. JENKINS: *Lifts.*

A lift or elevator consisting in the provision of driving or load-sustaining gear, constituted by two members having different peripheral velocity, which causes the suspension rope to be paid out or to be drawn in at a rate proportional to the difference of peripheral velocity of the respective members.

12,220 of 1903.—D. J. ARCHER: *Apparatus for Heating Air.*

Apparatus for heating air, comprising a radiator constructed so as to permit the maximum amount of heat to pass from the hot water contained therein, means for supplying the hot water to said radiator, and a suitable casing surrounding said radiator, the same being provided with lower openings through which cold air passes thereinto, and being further provided with upper openings through which the hot air passes therefrom.

14,491 of 1903.—J. PRICE: *Hinges for Doors or Gates.*

Hinging doors or gates, consisting in affixing the hinge and eye-bolt in position, so that when the said doors or gates are closed, the outer face thereof is flush or approximately so with the outer face of the fencing or brick work, and, at the same time, permit the doors or gates to be swung through an angle of 180 degrees or thereabouts.

17,329 of 1903.—H. VAN WIE: *A Sash Fastener.*

A sash fastener, comprising a rectangular plate, one member of which has a barrel connected thereto, and barrel having a longitudinal slot provided with notches at its ends, a bolt working in the said barrel and having a laterally-projecting pin or stud, a cap encircling the barrel and enclosing the said slot and notches, said cap having lugs formed thereon by which it is secured to the plate and a keeper plate, having an aperture or socket adapted to receive the forward end of the bolt.

589 of 1904.—H. WILSON and WILSONS AND MATHIESONS, LTD: *Method and Apparatus for Rapidly Heating Water for Domestic and Like Purposes.*

This invention relates to a method and apparatus for rapidly heating water for domestic and like purposes. In carrying out this invention an outer metal case is constructed. From the base of said case, some little distance towards the top, the case is formed with double walls, leaving a small space which is open at the top. Attached to the inner portion and at the top of same is a plate or the like, forming what may be termed the bottom of the outer case. In the said plate are formed two apertures. Leading from the top of the case is an opening, which may be connected to a pipe or the like in any convenient manner. At the opposite sides or ends of said case, in proximity to the bottom of same, are openings, such openings being for the admission of water to the space, the most convenient opening being used, a cap fitting over the one not in use, and the water supply pipe being connected to one of the openings in any convenient manner.

1,415 of 1904.—J. LEWIS: *A Safety Appliance for Mining and other Hoists.*

A safety appliance for hoists consisting in the combination, with a cage, of vertical guides between which the cage travels, a cable for raising and lowering the cage, tongs arranged to grip the guides and hold the cage stationary, flexible connexions between the tongs and the hoisting cable arranged to hold the tongs inoperative while the hoisting cable is taut, and means connected to the cage and constructed to automatically cause the tongs to clamp the guides and prevent the descent of the cage when the cable becomes slack.

1,998 of 1904.—C. A. BERGERSEN: *An Appliance for Raising and Lowering Window Sashes and Retaining Them in any Desired Position.*

An apparatus, consisting in the combination with a worm mounted on an axle revolvable in a bracket fixed to the window frame, a toothed pinion fixed upon the axle of the said axle, a toothed wheel gearing with the pinion and fixed by a pin passing through its boss upon a spindle revolvable in the said bracket, pins projecting radially from the spindle, a key having a socket to fit the spindle and slots, to engage the pins projecting from the

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spindle, the said spindle having a number of holes to adjust the distance at which it projects through the toothed wheel, and a rack fixed to the side of the sash, the teeth of the rack engaging with the worm.

6,049 of 1903.—D. A. LOW: *Drawing Scales, Offsets, Protractors, and Slide Rules.*

This invention relates to drawing scales, offsets, protractors, and slide rules, by means of which they can be made thin, flexible, and of practically unvarying length. They are made with a central layer or strip of well-seasoned wood or other material, the length of which does not vary appreciably with ordinary exposure. The division lines and figures are printed on the central layer of wood. Lastly, thin transparent celluloid strips are cemented on each side of the wood layer, or both faces may be saturated or coated with celluloid solution.

8,387 of 1903.—G. WILSON: *Slabs, Plates, or Blocks for Walls.*

Slabs, plates, or blocks with grooves, forming open channels, made in and along their bed and sides in such manner that the said grooves are gradually made deeper, commencing at or near to the middle of each slab and running right and left therefrom to the ends of the vertical channels, thereby two open inclined channels are formed, each running in an opposite direction, respectively along the top and bottom, end, bed, sides of each slab or block, so that when the slabs are fitted together to form a wall, the courses of the slabs easily break, joint and closed inclined channels are then formed, shaped in such manner that the air therein, also the air in the vertical channels (and recesses which may be made), escapes therefrom up the vertical channels as the liquid binding material (poured down the vertical channels) gradually fills the channels.

8,626 of 1903.—P. J. WOOD: *An Adjustable Roof Scaffold.*

It consists of three primary parts: (1) a base, (2) a supporting arm to carry the scaffold proper, (3) a thrust bearing, which holds the said supporting arm in position, and by means of which the necessary levelling adjustments are made. The base consists of a piece of flat or other suitable material, formed to a horseshoe or other convenient shape, and having on its underside a strip or pieces of rubber or other material to act as a buffer between the base and the tiles on which it may be resting when in use, and as a means of preventing slipping.

8,682 of 1903.—A. P. MACALISTER and R. R. GIBBS: *Linings or Walls of Refrigerating Chambers, Heating Chambers, Safes, Strong Rooms, or the like.*

This relates to refrigerating chambers, heating chambers, safes, strong rooms, or the like, and consists in insulating the walls or rendering them non-conductive to heat by packing them with a lining of boxes or cases containing nonconducting or insulating composition, said boxes being built up all round the chamber in close contact, whereby this division of the insulation into a number of small cases or cells prevents the insulation settling down, of its own weight, and so leaving empty spaces at top, as occurs where the material is placed in the cavity in bulk.

9,352 of 1903.—J. MERRILL: *Urinals.*

This invention relates to glazed ware urinals, whether with circular or oval backs, that have channels to carry off the urine. In these there is an obstruction at each point where the backs cross the channel. To obviate this, the backs are constructed with spaces left out at the lower part, and these spaces are filled in with division pieces projecting from the back so as to engage the backs and form support to them, leaving a clear run of the channel from end to end.

21,817 of 1903.—W. CUNLIFFE: *Dust Bins or Similar Portable Receptacles for Containing Domestic or other Refuse.*

Means of securing the lids or covers of dust bins and similar receptacles, consisting of a rod or bar secured to the underside of the lid and passing through a hole in the bin, the lid being capable of being turned down the side of the bin, guided and held by the rod.

781 of 1904.—W. H. BONGARTZ: *Apparatus for Construction of Concrete, Cement, or like Walls.*

An apparatus for construction of concrete, cement, or like walls, consisting of several boards, whose narrow edges are placed upon each other, and which mutually support each other by means of struts, said boards being held together by connecting means (trusses, screws, etc.) passing through them and enabling them to be adjusted to any distance desired to correspond to the thickness of wall required and which, by means of dies also held in the planks by bolts, "enables a design to be stamped at once into the wall being made."

TO CORRESPONDENTS.

"A REGULAR READER OF YOUR PAPER" (Letters without address or signature are *not read* by the editor, who always looks to the signature first).——G. G. B.—T. F.—A. G. (Amounts should have been stated).——W. H. M.—F. G. B. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER and not to the Editor.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 16.—By KIVELL & HARRIS (at Holsworthy).

Holsworthy, Devon. — "Southcott Farm," 352 a. 2 r. 11 p., f.	£2,350
"Keephill's Farm," 113 a. 0 r. 16 p., f.	1,550
"Greenway," etc., closes, also cottage and s., area 5 a. 3 r. 17 p., f.	850

March 17.—By NIGHTINGALE, PHILLIPS, & PAGE (at Kingston).

Kingston-on-Thames, Surrey. — Penrhyn-rd., "St. Alban's House," u.t. 53 yrs., g.r. 50*l.*, e.r. 150*l.*	700

March 21.—By HY. CHAPMAN & CO.

Southall, Middlesex. — Avenue-rd., a freehold building site, area 7,770 ft., f.	350

By MAY & PHILPOT.

Brixton.—175, Tulse-hill, area ½ an acre, u.t. 69 yrs., g.r. 19*l.* 5s., p.	1,450
18 and 20, Brandon-rd., u.t. 46½ yrs., g.r. 5*l.* 5s., e.r. 62*l.* 8s.	450
382, Brixton-rd., u.t. 22 yrs., g.r., etc., 10*l.* 18s., p.	250

By NICHOLAS, DENYER, & CO.

Stoke Newington. — 100 and 102, Park-st., u.t. 76 yrs., g.r. 14*l.*, y.r. 64*l.*	720
26 to 32 (even), 36 and 38, Grayling-rd., u.t. 76¼ yrs., g.r. 42*l.*, y.r. 220*l.*	2,420

By T. B. WESTACOTT.

Regent's Park. — 76, Delancey-st., u.t. 19 yrs., g.r. 4*l.* 10s., e.r. 55*l.*	450
Acton.—72, Mill Hill-rd., f., y.r. 30*l.*	525

March 22.—By REYNOLDS & EASON.

Bethnal Green.—Surat-st., f., g.r. 21*l.* 15s., reversion in 59 yrs.	495

By WRIFORD, DIXON, & WINDER.

Wandsworth.—16, Morella-rd., u.t. 77¼ yrs., g.r. 8*l.* 15s., y.r. 46*l.*	475
Dulwich.—110, Goodrich-rd., u.t. 88 yrs., g.r. 5*l.* 10s., y.r. 50*l.* 14s.	365

By NIGHTINGALE, PHILLIPS, & PAGE (at Surbiton).

Claygate, Surrey.—1 to 12, New-rd., f., w.r. 280*l.* 16s.	2,950
Hare-la., six freehold villas, e.r. 240*l.*	2,720

March 23.—By GIDDY & GIDDY.

Chobham, Surrey.—"Malthouse Farm," 12a. or. 31p., f., p.	800

By HOBSON, RICHARDS, & CO.

Herne Hill.—23, 25, and 27, Lowden-rd., u.t. 62 yrs., g.r. 14*l.* 10s., y.r. 99*l.* 8s.	815
Anerley.—27 to 33 (odd), Stoddart-rd., u.t. 72½ yrs., g.r. 22*l.*, y.r. 156*l.*	700
Norwood.—154, 156, and 162, Tennison-rd., u.t. 67½ yrs., g.r. 16*l.* 10s., y.r. 98*l.* 16s.	510
Brixton.—35, 39, 41, 43, and 44, Perran-rd., u.t. 75¼ yrs. g.r., 32*l.* 10s., y.r. 166*l.*	1,245
Wandsworth.—27 to 35 (odd), Lower-gr., u.t. 56¾ yrs., g.r. 20*l.*, y.r. 137*l.* 6s.	770

By THURGOOD & MARTIN.

Leicester-square.—8, 9, and 10, Lisle-st. (s.), area 2,525ft., f., y.r. 297*l.* 10s.	9,500
Hackney.—116, 116a, 118, and 120, Mare-st. (s.), and 5, Tryon-ct., area 2,900ft., f., y.r. 156*l.* 6s.	1,300

By F. G. WHEATLEY & SON.

Stratford.—173 and 175, Romford-rd., f., 118*l.*	1,800
Canning Town.—1 and 3, Francis-st., f., w.r. 54*l.* 10s.	425
Poplar.—15, Mauve-st. (s.), and 1, St. Leonard's-av., f., y.r. 42*l.*	550
Blackwall.—12, Harrup-st., and 8, Scouler-st., u.t. 53½ yrs., g.r. 6*l.* 15s., y.r. 54*l.* 12s.	415

By WESTMORE & YOUNG.

Norwood.—58, Central-hill, u.t. 50½ yrs., g.r. 13*l.* 5s., e.r. 70*l.*	235

By ERNEST OWERS.

Hampstead.—1 and 2, College-ter., u.t. 48 yrs., g.r. 20*l.*, y.r. 190*l.*	1,650
Hounslow, Middlesex.—49, High-st. (s.), area 16,690ft., c., y.r. 40*l.*	850
Bermondsey.—1, Salisbury-pl., f., w.r. 22*l.* 2s.	205
Ealing.—Conings by-rd., f.g.r. 74*l.*, reversion in 54 yrs.	1,808
Alacross-villas, f.g.r. 35*l.*, reversion in 54 yrs.	685

March 24.—By EDWIN EVANS.

Westminster.—20 and 21, Kensington-pl., u.t. 15½ yrs., g.r. 10*l.*, e.r. 65*l.*	£2[illegible]
13, 14, and 15, Kensington-pl., and 30 and 34, Vincent-st., u.t. 5½ yrs., g.r. 20*l.*, y.r. 164*l.* 10s.	18[illegible]
Pimlico.—6, Aylesford-st., u.t. 33½ yrs., g.r. 8*l.*, e.r. 48*l.*	29[illegible]
Wandsworth.—4, Keswick-ter., u.t. 76½ yrs., g.r. 8*l.* 8s., e.r. 45*l.*	415
Barnsbury.—Hemingford-rd., l.g.r. 18*l.*, u.t. 38½ yrs., g.r. 4*l.*	23[illegible]
Romford, Essex.—91 to 129 (odd), Mark's-rd., u.t. 50½ yrs., g.r. 94*l.*, w.r. 277*l.* 11s.	70[illegible]
New Malden, Surrey.—Hardy-ter., f.g.r. 15*l.*, reversion in 95 yrs.	315

By FAREBROTHER, ELLIS, & CO.

Cripplegate.—70, 72, 74, and 76, Whitecross-st. (s.), area 16,500 ft., f., p.	15,000

By C. C. & T. MOORE.

Stepney.—13, Rectory-sq., u.t. 60 yrs., g.r. 4*l.* 10s., y.r. 30*l.*	360
Leytonstone.—11 to 31 (odd), Harrow-green, with yard, stabling, etc., area 13,000 ft., u.t. 26 yrs., g.r. 45*l.*, w.r. 252*l.* 6s.	1,070
Hackney.—2, 4, 6, and 8, Holcroft-rd., u.t. 39 yrs., g.r. 12*l.*, w.r. 158*l.* 12s.	980

By VARLEY & LOCKING.

Stoke Newington.—28, Fairleigh-rd., u.t. 60 yrs., g.r. 7*l.*, e.r. 55*l.*	475

By NEWBON, EDWARDS, & SHEPHARD.

King's Cross.—89, Argyle-sq., u.t. 37 yrs., g.r. 7*l.* 10s., y.r. 60*l.*	640
Caledonian-rd.—No. 516, u.t. 38 yrs., g.r. 2*l.*, y.r. 60*l.*	490
Caledonian-rd.—No. 518, l.g.r. 10*l.*, u.t. 38 yrs., g.r. nil	145
Holloway.—94, 98, and 106, Hornsey-rd. (s.), u.t. 38½ yrs., g.r. 12*l.*, y.r 135*l.*	950
Dalston.—98, Lenthall-rd., u.t. 55¼ yrs., g.r. 9*l.* 9s., y.r. 42*l.*	400
Wandsworth.—38a, Earlsfield-rd., f., e.r. 42*l.*	545

By STIMSON & SONS.

Southwark.—80, Great Dover-st., f., y.r. 48*l.*	760
Sydenham.—2 and 4, Trewsbury-rd., u.t. 66 yrs., g.r. 18*l.*, y.r. 80*l.*	700
2, 4, and 6, Kangley Bridge-rd., u.t. 66 yrs., g.r. 18*l.* 18s., w.r. 88*l.* 8s.	450
Plumstead, Kent.—118 and 118A, High-st. (s.), f., y.r. 165*l.*	3,050
Merton.—55, 57, 61, and 63, High-st. (s.), f., y.r. 152*l.* 18s. 8d.	2,460
1 to 11 (odd), Briscoe-rd., f., w.r. 156*l.*	1,660
Briscoe-rd. (freehold warehouse, stabling, etc.), y.r. 54*l.* 2s.	440
Tooting.—102 and 104, Upper Tooting-rd. (s.), f., y.r. 102*l.*	1,850

March 25.—By KNIGHT, FRANK, & RUTLEY.

Woolley, Hunts.—"The Woolley Manor Estate," including "Manor" and "Lodge" Farms, 940a. 3r. 8p., f., y.r. 744*l.*	11,000

By BLAKE & DANNATT.

Catford.—5 to 15 (odd), Wildfell-rd., u.t. 71 yrs., g.r. 12*l.*, w.r. 148*l.* 4s.	880

By C. W. DAVIES & SON.

Stoke Newington.—35, Hawksley-rd., u.t. 70 yrs., g.r. 6*l.*, y.r. 28*l.*	245
16 to 21, Brown's-pl., u.t. 9½ yrs., g.r. 9*l.*, w.r. 114*l.* 8s.	230
Hackney.—105 to 121 (odd), Pritchard's-rd., u.t. 68½ yrs., g.r. 41*l.*, w.r. 206*l.* 14s.	1,130

By HILLIER & PARKER.

Lewisham.—48A, High-st. (s.), f., y.r. 160*l.*	2,525
91, High-st. (s.), f., y.r. 60*l.*	1,050
East Ham.—220, High-st. (s.), f., y.r. 85*l.*	1,480
High Barnet, Herts.—110, 112, and 112A, High-st., f., y.r. 275*l.*	4,750

By NOTT, CARTWRIGHT, & ETCHES.

Pimlico.—114, Lupus-st. (s.), u.t. 30 yrs., g.r. 9*l.*, y.r. 100*l.*	900
93, Lupus-st. (s.), u.t. 24 yrs., g.r. 10*l.*, y.r. 80*l.*	735
33, Moreton-ter., u.t. 27 yrs., g.r. 8*l.*, e.r. 84*l.* 10s.	420
Croydon.—4, Elmwood-rd., f., y.r. 45*l.*	550

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

MONDAY, APRIL 4.

Regent-street Polytechnic.—Professor Vivian Lewes on "The Chemistry of Air, Fire, and Water." X. 8 p.m.

Liverpool Architectural Society. — Annual General Meeting.

WEDNESDAY, APRIL 6.

Edinburgh Architectural Association.—Mr. J. Douglas Traill on "The Uses of Woods for Internal Work." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.

Institute of Certified Carpenters (*Carpenters' Hall*).—Mr. H. Eustice on "Timbering in Mines," illustrated with lantern slides. 6 p.m.

FRIDAY, APRIL 8.

Junior Institution of Engineers (*Westminster Palace Hotel*).—Paper on "The Heating and Ventilation of Factories," by Mr. Kenneth Gray. 8 p.m.

Glasgow Architectural Craftsmen's Society.—Business Meeting. 8 p.m.

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PUBLISHER'S NOTICES.

Nat. Tel., 613, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXV. (July to December, 1903) was given as a supplement with issue of January 9 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each.

THE EIGHTY-FIFTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

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PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps must not be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE noon on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS advertising in "THE BUILDER" may have *Replies addressed to the Office*, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" at railway depôt.
Red Wire Cuts	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality, White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	30 0	per ton, "
Best Ground Blue Lias Lime	21 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)— Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancester in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
CloseburnRedFreestone	2 0	" "
Red Manstield "	2 4	" "
YORK STONE—*Robin Hood Quality.*	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides (slabs random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "

Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
" " " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt
" " " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 best seconds "	12 15 0	" "
20 × 12 " " "	13 10 0	" "
16 × 8 " " "	7 0 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 best blue Portmadoc	6 12 6	" "
20 × 10 best Eureka unfading green	15 2 6	" "
20 × 12 " "	17 2 6	" "
18 × 10 " "	12 10 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 10 0	" "
18 × 10 " "	9 10 0	" "
16 × 8 " "	6 10 0	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. " "
Best Brosely tiles	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " "
Hip and Valley tiles	4 0	per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 " "
Do. Ornamental do	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced	50 0	per 1000 " "
Do. pressed	47 6	" " "
Do. Ornamental do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less thn best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
⅜ in.	1 0 0	"
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0
JOINERS' WOOD.		
White Sea: first yellow deals, 3 in. by 11 in	At per standard. 23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0

WOOD—(*continued*).

	At per standard. £ s. d.	£ s. d.
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg: — First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube	0 4 0	—

Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ...	7 5 0
Compound Girders, ordinary sections	8 2 6 ...	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ...	8 17 6
Flitch Plates	8 5 0 ...	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ...	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	7 5 0 ...	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0 ...	8 5 0
Staffordshire "Marked Bars"	10 0 0 ...	—
Mild Steel Bars	8 15 0 ...	9 5 0
Hoop Iron, basis price	9 5 0 ...	9 10 0
" Galvanized	17 10 0 ...	—
(*And upwards, according to size and gauge.)		
Sheet Iron (Black)— Ordinary sizes to 20 g.	9 15 0 ...	—
" " 24 g.	10 15 0 ...	—
" " 26 g.	12 5 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ...	—
Ordinary sizes to 22 g. and 24 g.	13 5 0 ...	—
" " 26 g.	14 5 0 ...	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	16 0 0 ...	—
" " 22 g. and 24 g.	16 10 0 ...	—
" " 26 g.	18 0 0 ...	—
Galvanised Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0 ...	—
" " 22 g. and 24 g.	13 0 0 ...	—
" " 26 g.	13 15 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0 ...	—
" " " 26 g.	14 0 0 ...	—
Cut nails, 3 in. to 6 in. (Under 3 in., usual trade extras.)	9 0 0 ...	9 10 0

LEAD, &c.

	Per ton, in London £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 15 0 ...	—
Pipe in coils	15 5 0 ...	—
Soil pipe	17 15 0 ...	—
Compo pipe	17 15 0 ...	—
ZINC—Sheet— Vieille Montagne ...ton	26 5 0 ...	—
Silesian	26 0 0 ...	—
COPPER— Strong Sheet.....per lb.	0 0 10½ ...	—
Thin " "	0 0 11½ ...	—
Copper nails "	0 0 11 ...	—

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Fire Appliances, Bangour Village Asylum	Edinburgh District Lunacy Board	H. J. Blanc, R.S.A., Architect, 25, Rutland-square, Edinburgh	April 4
Oil Tank and Steam Boiler at Gasworks	Dundee Gas Commissioners	A. Yuill, Engineer, Gasworks, Dundee	do.
1,000 Tons of Whin Metal	Wishaw Town Council	W. Rodger, Burgh Surveyor, Wishaw	do.
Causewaying	Hamilton Town Council	Burgh Surveyor's Office, 19, Cadzow-street, Hamilton	do.
Road Metal	do.	do.	do.
Additions to Business Premises, Bridge-row	Darlington Corporation	G. Winter, Borough Surveyor, Town Hall, Darlington	do.
Drainage, etc., Plymouth Workhouse	The Guardians	H. J. Snell, Architect, 11, The Crescent, Plymouth	April 5
Corrugated Iron School Building for 300	Warrington Education Committee	T. Longdin, Borough Surveyor, Warrington	do.
Cast-iron Frames and Clamps	Manchester Tramways Committee	J. M. M'Elroy, Tramways Department, 55, Piccadilly, Manchester	do.
Furnishings at Gasworks	Dundee Gas Commissioners	A. Yuill, Engineer, Gasworks, Dundee	do.
Leading Rails (2,000 to 2,500 of Steel Tram Rails)	Rochdale Tramways Committee	Borough Surveyor, Town Hall, Rochdale	do.
Ragstone and Pit Flints	Sheppey R.D.C.	J. Copland, Clerk to the Council, Sheerness	do.
Wesleyan Manse at Gomersal	.....	F. & J. A. Wright, Architects, 1013, Wakefield-road, Bradford	April 6
School, Hemsworth, near Wakefield	.....	W. E. Richardson, Architect, Rothwell, Leeds	do.
Dumer's-lane Improvement	Radcliffe U.D.C.	Engineer to Council, Council Offices, Radcliffe	do.
Rebuilding Little George Inn, Chippenham	Messrs. Wilkins Bros. & Hudson	H. W. Matthews, Architect, Institute-chamb., Terrace-walk, Bath	do.
Additions to Stabling at Workhouse	Cannock Guardians	A. Veall, Architect, 84, Darlington-street, Wolverhampton	do.
Beighton Sewerage and Sewage Disposal	Chesterfield R.D.C.	E. Lines, C.E., Union Offices, Chesterfield	do.
Paving and other Work, Stoneham-road, etc.	Hove Corporation	H. H. Scott, Borough Surveyor	do.
Painting Sheds at Harbour and Victoria Dock	Leith Harbour Commissioners	Office of Superintendent, Tower-place, Leith	do.
Laying Causeway at Edinburgh Docks	do.	do.	do.
Timber Planking, West Pier, Leith	do.	do.	do.
20-Ton Steam Crane, Victoria Dock	do.	do.	do.
Timber Groyne	Ventnor U.D.C.	Surveyor to Council, Town Hall, Ventnor	April 7
Pair Semi-Deta. Ho., Quaker's-yd. Junc., Treharris	.....	W. Dowdeswell, Architect, Treharris	do.
Road Materials	Whiston R.D.C.	R. J. Knapman, C.E., Highway Surv., Delph-la. Offices, Whiston	do.
Stores	do.	do.	do.
Carting Road Materials	do.	do.	do.
*Electricity Generating Station	Stepney Borough Council	Borough Engineer, 15, Great Alie-street, Whitechapel, E.	do.
Church of St. Nicholas, Dundalk	.....	W. H. Byrne & Son, Architects, 20, Suffolk-street, Dublin	April 8
Additions to Kirkhill House, Offices and Cottage	.....	J. Wittet, Architect, Elgin	do.
House at Macallan Distillery	.....	10, Seafield-square, Rother	do.
Stone	Droitwich Corporation	H. Hulse, Borough Surveyor, Droitwich	do.
Granite Setts	Shipley U.D.C.	W. H. Dawson, Surveyor, Shipley	April 9
Stores	S.E. & Chatham Railway Co.	Superintendent of Stores, 84, Tooley-street, S.E.	do.
Library and Caretaker's House at Penarth	Penarth U.D.C.	H. Snell, Architect, Stanwell-road, Penarth	do.
Sixteen Houses in Park-avenue, Barry	.....	E. David & David, 27, High-street, Cardiff	do.
2,140 tons of Granite	Aylesbury R.D.C.	F. B. Parrott, Clerk, Bourbon-street, Aylesbury	April 11
Cleaning Down, Painting, etc., Police Station	Leeds Corporation	City Engineer's Office, Leeds	do.
Granite and Flints	Rochford R.D.C.	F. Gregson, Clerk, Southend-on-Sea	do.
Stores	Edinburgh & Leith Gas Commrs.	Chief Engineer, Gasworks, New-street, Edinburgh	do.
Cast-iron Keel Blocks	Belfast Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast	do.
Laundry at Bangour	Edinburgh District Lunacy Board	H. J. Blanc, R.S.A., Architect, 25, Rutland-square, Edinburgh	do.
Carnegie Library and Museum, Limerick	Trustees	G. P. Sheridan, A.R.I.B.A., 25, Suffolk-street, Dublin	do.
Street Works, Sevenoaks	U.D.C.	S. Towlson, Surveyor to the Council, Argyle-road, Sevenoaks	do.
*Painting, Cleaning, etc., South Branch Library	M.B. of Fulham	Borough Engineer, Town Hall, Fulham, S.W.	do.
Drapery Warehouse, Elgin	Messrs. T. Baxter & Co.	R. B. Pratt, Town and County Bank-buildings, Elgin	do.
Steel Purifier Covers	Huddersfield Gas Committee	E. A. Harman, M.Inst.C.E., Gasworks, Huddersfield	April 12
Extension of Castleton Sewage Disposal Works	Rochdale Corporation	S. S. Platt, Borough Surveyor, Town Hall, Rochdale	do.
Police and Fire Station, Langton-road, Brislington	Bristol Watch Committee	T. H. Yabbicom, City Engineer, 63, Queen-square, Bristol	do.
Two Steam Turbines, King's-road Power Station	St. Pancras Borough Council	Electricity Department, 57, Pratt-street, N.W.	do.
Slop Vans, Water Vans, and Material Carts	Willesden D.C.	Engineer to the Council, Public Offices, Dyne-rd., Kilburn, N.W.	do.
Two 750-k.w. Turbo Generators	Manchester Electricity Committee	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester	April 13
Alterations, etc., to High Pressure Steam Piping, etc.	do.	do.	do.
Electric Plant for Locomotive Workshops	East Indian Railway Company	C. W. Young, Secretary, Nicholas-lane, E.C.	do.
460 Yards Ornamental Rails, etc., Cathays Park	Cardiff Corporation	W. Harpur, M.Inst.C.E., Borough Engineer, Cardiff	do.
Iron Weir Frames and Gearing	Thames Conservancy	Victoria Embankment, E.C.	do.
Sawn Timber	do.	do.	do.
Brick and Pipe Sewers, Belgrave	Leicester Corporation	E. Geo. Mawbey, M.Inst.C.E., Town Hall, Leicester	April 14
Whinstone and Slag	Helmsley R.D.C.	R. Pearson, Clerk, Helmsley	do.
Timber, Iron, and Stores	Leith Harbour Commissioners	Office of Superintendent, Tower-place, Leith	do.
*Granite Spalls	County Borough of Brighton	Borough Engineer, Town Hall, Brighton	do.
Electric Crane	Woolwich Borough Council	F. Sumner, Borough Engineer, Maxey-road, Plumstead	do.
Works Offices & Stokers' Lobby, Ash-road Gasworks	Aldershot Gas and Water Company	R. W. Edwards, Secretary, Gas and Water Offices, Aldershot	April 15
Stores	Glasgow Corporation	J. Young, 102, Renfield-street, Glasgow	do.
Glass Plates	Director-General, Ordnance Survey	Officer in Charge of Stores, Ordnance Survey Office, Southampton	do.
Manse, Rothiemurchus	United Free Church	A. Davidson, Merchant, Aviemore	do.
Electricity Supply Station, Bridge-st., Loughborough	Loughborough Corporation	A. E. King, Architect, Baxter-gate, Loughborough	April 16
1,450 Yards of Stone, etc.	Southborough U.D.C.	P. Hanmer, Clerk, Southborough	do.
Lithographic Stones	Director-General, Ordnance Survey	Officer in Charge of Stores, Ordnance Survey Office, Southampton	do.
Heating & Ventilating Council Schs., Dean-la., St. Geo.	Bristol Education Committee	La Trobe & Weston, Architects, 20, Clare-street, Bristol	April 18
Railway to Dock at Clydebank	North British Railway Company	J. Cathles, Secretary, 23, Waterloo-place, Edinburgh	do.
Alterations at Old Electricity Works, Broughton	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	do.
Railway between Clarbeston-road and Letterston	G.W. Railway Company	Engineer's Office, Paddington Station, London	April 19
*Reconstruction of Royal Oak Station, W.	do.	do.	do.
*Alterations to Fire Station, Duke-street	County Borough of Brighton	Borough Engineer, Town Hall, Brighton	do.
Stores, Gas and Water Department	Wallasey U.D.C.	J. H. Crowther, Engineer, Great Float, near Birkenhead	April 20
150 Fixed Revolving Chairs for Libraries	Glasgow Corporation	J. G. Monro, Town Clerk, City-chambers, Glasgow	do.
Road Material	Houghton-le-Spring R.D.C.	D. Balfour, Engineer, Houghton-le-Spring, R.S.O.	do.
*Stables and Depot Buildings in Cleveland-street	County Borough of Birkenhead	Borough Engineer, Town Hall, Birkenhead	do.
Road Materials, Ketton District	Rutland County Council	B. A. Adams, Clerk, Oakham	April 21
Team Labour	do.	do.	do.
Movable Double-power Hydraulic Crane	Swansea Harbour Trustees	A. O. Schenk, M.Inst.C.E., Harbour Offices, Swansea	do.
30-cwt. Movable Hydraulic Crane	do.	do.	do.
Fixed Hand-power Wharf Crane	do.	do.	do.
Hydraulic Accumulator and Steel Tower	do.	do.	do.
*New Sorting Office, Seaforth, Liverpool	Commissioners of H.M. Works, etc.	H.M. Office of Works, Liverpool	do.
*Erection of Infirmary, Leigh	The Committee	J. C. Prestwich, Brad-hawgate-buildings, Leigh	April 22
Extension Switch Board Panel	Edinburgh Corporation	Resident Electrical Engineer, Dewar-place Station, Edinburgh	April 23
Steam and Exhaust Pipe Work	do.	do.	do.
Construction of Seathwaite Tarn Dam, etc.	Barrow-in-Furness Corporation	A. H. Strongitharm, C.E., Ramsden-square, Barrow-in-Furness	do.
Construction of Covered High Service Reservoir	do.	do.	do.
Repairs to Roofs of Mayor's Paddock Baths	Bristol Baths Committee	T. H. Yabbicom, City Engineer, 63, Queen-square, Bristol	April 25
Electric Power and Lighting	G.W.R. Company	Kennedy & Jenkin, Engineers, 17, Victoria-street S.W.	April 26
Additions, etc., Pentrepoth School	Swansea School Board	A. W. Halden, Clerk, School Bd. Offices, Dynevor-place, Swansea	April 27
Additions, etc., Danygraig School	do.	do.	do.
Sewerage and Sewage Disposal Works	Bollington U.D.C.	W. H. Radford, C.E., Albion-chambers, King-street, Nottingham	April 30
Mason's Labour, Residence at Askwith	.....	Limpsall & Clarkson, Architects, 7, Exchange, Bradford	No date
Stables and Carriage House, etc.	.....	L. F. Eagleton, Architect, King-street, King's Lynn	do.
Wesleyan Chapel and Schs., Wellington-av., Liverpool	.....	W. J. Morley & Son, Architects, 269, Swan Arcade, Bradford	do.
Mission Hall at Linacre, near Liverpool	.....	do.	do.
Altera., Salvation Army Temple, Chorlton-on-Medlock	.....	Lt.-Col. Jeffries, 150A, Oxford-road, Manchester	do.
2,500 Yards of Asphalt	Wellington R.D.C.	G. F. Bearn, Assistant-Surveyor, Market-square, Wellingborough	do.
*Erection of Church, Fishponds, Bristol	.....	Lingen, Barker, & Son, Architects, 9, Clare-street, Bristol	do.
350 Yards of 3-in. Gas Pipe	Aberlour Gas Light Company	P. M'Donald, Manager, 82, High-street, Aberlour	do.

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Architectural Assistant	City of Birmingham	3*l.* per week	April 12
*Architectural Assistant and County Surveyor	County of Southampton	250*l.*	April 16
*Civil Engineering Draughtsman	Admiralty	Not stated	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, — *Contracts*, iv. vi. viii. x. *Public Appointments*, xviii.

PRICES CURRENT—*Continued from page 377.*

LEAD, &c.—(*continued*)—

	Per ton. £ s. d.	Per ton. £ s. d.
BRASS—		
Strong Sheet ..... per lb.	0 0 10 ...	—
Thin ,, ... ,,	0 0 11 ...	—
TIN—English Ingots ..... ,,	0 1 4 ...	—
SOLDER—Plumbers' ..... ,,	0 0 6½ ...	—
Tinmen's ..... ,,	0 0 8 ...	—
Blowpipe ..... ,,	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft. delivered.
,, fourths	1½d. ,, ,,
21 oz. thirds	3d. ,, ,,
,, fourths	2½d. ,, ,,
26 oz. thirds	3½d. ,, ,,
,, fourths	3d. ,, ,,
32 oz. thirds	4½d. ,, ,,
,, fourths	4d. ,, ,,
Fluted Sheet, 15 oz.	2½d. ,, ,,
,, 21 oz.	3½d. ,, ,,
⅛ Hartley's Rolled Plate	1¾d. ,, ,,
¼ ,, ,, ,, ...	1¾d. ,, ,,
½ ,, ,, ,, ...	2½d. ,, ,,

OILS, &c.	£ s. d.
Raw Linseed Oil in pipes or barrels . per gallon	0 1 6
,, ,, ,, in drums ,,	0 1 9
Boiled ,, ,, in pipes or barrels . ,,	0 1 9
,, ,, ,, in drums ,,	0 2 0
Turpentine, in barrels ,,	0 3 8
,, in drums ,,	0 3 10
Genuine Ground English White Lead per ton	19 0 0
Red Lead, Dry ,,	19 0 0
Best Linseed Oil Putty ..... per cwt.	0 7 6
Stockholm Tar ..... per barrel	1 12 0

VARNISHES, &c.	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

*** Denotes *accepted*. † Denotes *provisionally accepted*.**

ABERBEEG.—For erecting twenty houses, for the Tir Graig Building Club. Mr. P. Vivian Jones, architect, Hengoed:—

	Per house.
M. Adams, Abertillery*	£189 0 0

BERWICK-UPON-TWEED.—For 2,700 super yards of concrete footpaths on searoad and promenade, Spittal, and coating pier with granite concrete, for the Sanitary Authority. Mr. R. Dickinson, Borough Surveyor, Berwick:—

Robert Rule, Coldstream (Pier Footpath)	£217 15 10
D. Storar & Sons, Spittal (Promenade and Sea Road)	502 1 8

CARDIFF.—For additions and alterations to the Wilts and Dorset Bank, Newport-road, Cardiff, for the directors. Mr. E. H. Bruton, architect, 119, Queen-street, Cardiff. Quantities by Architect:—

		Allowance for old materials.
D. Davies	£3,550 0 0 ..	£25 0 0
C. Beames & Nephew	3,320 0 0 ..	20 0 0
S. Shepton & Son ..	3,289 0 0 ..	53 0 0
G. Hallett	3,205 0 0 ..	—
S. Andrews & Son ..	3,064 10 6 ..	50 0 0
F. Bond	2,980 0 0 ..	—
Lattey & Co.	2,887 19 4 ..	40 0 0
Gough Bros.	2,850 0 0 ..	—
G. Burgess	2,860 11 0 ..	55 0 0
J. E. Williams	2,820 0 0 ..	15 0 0
S. J. T. Grinter	2,797 0 0 ..	—
W. J. Morgan	2,790 0 0 ..	—
A. W. Cadwallader ..	2,737 3 8 ..	7 3 8
W. Thomas & Co. ..	2,706 0 0 ..	20 0 0
J. Allan & Son	2,750 13 0 ..	100 13 0
E. Turner & Sons* ..	2,598 0 0 ..	—

[All of Cardiff.]

DEWSBURY.—For the erection of a shed and home, &c., at Watergate. Messrs. Holtorn & Fox, architects, Corporation-street, Dewsbury:—

Humphreys & Green	£289	13	2
Wilson Bros. ..	80	0	0
Newsome & Askham	32	0	0
G. Fawcett ..	30	11	0
F. Newsome ..	28	15	0
Standard Patent Glazing Co.	27	0	0
J. Lookwood ..	12	10	0
L. Porritt	5	15	0

DOVER.—For completing the carriage-way, kerbing, paving, etc., of Kitchener-road, for the Town Council. Mr. H. E. Stilgoe, Borough Engineer, Maison Dieu House, Dover:—

Tobin & Co. ..	£376	3	5
T. C. Starkey ..	350	11	7
G. Lewis & Sons	309	1	4
G. Keeler	290	15	0
S. Lewis	£290	5	0
G. Munro	281	0	5
W. H. Grigg, Dover*	276	14	10

EASTLEIGH (Southampton).—For drainage and other works, Newtown Estate, for Messrs. Morris, Ashby, and Thos. Eliott. Mr. William Burrough Hill, F.S.I., architect and surveyor:—

W. H. Whitehead	£1,842 18 0
J. Treherne	1,294 1 8
F. Osman	1,225 0 0
Douglas & Richards, Southampton*	1,117 7 6

ERMINGTON (Devon).—For the erection of four houses, for Mr. J. Treneman. Mr. William Harvey, architect, Cornwood, Devon:—

Flashman	£1,043	7	6
Prowse	985	5	0
Andrews	925	0	0
Vincent	897	0	0
Lakeman, Avetongifford, Kingsbridge*	£800	0	0

GLASGOW.—Accepted for the erection of warehouses and other buildings at the corner of Nelson-street (Westside) and Bell-street, for the Corporation. Messrs. Thomson & Sandelands, architects, 241, West George-street, Glasgow:—

Mason Work: J. Green & Co., Glasgow* ..	£9,896 5 2
Carpenter, etc., Work: H. McTaggart, Bridgeton, Glasgow*	5,017 10 9
Cast Iron Work: P. & R. Fleming & Co., Glasgow*	413 18 10
Steel Work: W. Little & Sons, Edinburgh*	2,201 17 2
Carver: W. Morgan & Young, Glasgow*	307 18 0
Plumber and Gas: J. Raeside, Glasgow* ..	1,425 3 8½
Plaster: Wemyss & Livingstone, Glasgow*	602 16 1½
Glazier: R. L. Paterson & Co., Glasgow*	510 0 0
Tile: Cherry & Co., Ltd., Glasgow*	920 18 6
Fireproof Flooring: Ferguson & Co., Carlisle*	1,552 12 5
Painter: T. C. Watson, Glasgow*	390 12 0

GRAVELLY HILL.—For a one-story building at the workhouse, to receive a steam disinfector, for the Aston Guardians. Messrs. Whitwell & Son, architects, 23, Temple-row, Birmingham:—

A. Colin Hughes, Stratford-road, Birmingham £212

HANDSWORTH.—For making-up, and storm-water drainage of, Park-lane, for the Urban District Council. Mr. B. Powell, Surveyor, Council Offices, Woodhouse. Quantities by Engineer and Surveyor to the Council:—

J. Glithro	£1,376 3 7
J. E. Nadin	1,095 9 4
Pinder Bros., Intake, Sheffield*	998 0 0

[Engineer's estimate, £1,003 10s.]

HARROGATE.—For private street improvement works in St. Peter's-square, for the Corporation. Mr. F. Bagshaw, Borough Engineer, Harrogate. Quantities by Borough Engineer:—

G. Parsons, Plantation-avenue, Harlow-hill, Harrogate* £166

HARROGATE.—For sewers and surface water drains in Knaresborough-road and Leeds-road, for the Corporation. Mr. F. Bagshaw, Borough Engineer, Harrogate:—

Knaresborough-road Works.

C. H. Dickinson, Starbeck, Harrogate* £2,060

Leeds-road Works.

Leedham Bros., Christiana-street, New Park, Harrogate* £588

HAVANT (Hants).—For new roads, etc., on the Bellair Estate, for Major Stubington. Mr. A. E. Stallard, surveyor, West-street, Havant:—

		Revised Tenders.
Tanner & Streeter .	£1,629 6 0 ..	—
J. A. East	1,603 0 0 ..	—
J. C. Trueman	1,358 0 0 ..	£999 0 0
Harvey Bros.	1,293 13 0 ..	1,076 2 3
J. G. Porter, 2, Gladeswood-road, Belvedere, Kent*	1,249 0 0 ..	949 0 0

HALSTEAD (Essex).—For alterations and additions to the Infirmary and Board Room at the Workhouse, for the Halstead Board of Guardians. Messrs. Clare & Ross, architects and surveyors, 1, West-street, Finsbury-circus, E.C., and at Chelmsford and Westcliffe-on-Sea. Quantities by the architects:—

[Estimate A:—For the two new wings to infirmary. Estimate B:—For alterations to infirmary, boundary walls, etc. Estimate C:—For alterations and additions to board room, etc.]

	A	B	C	Total.
W. J. Elsdon	£4,076	£1,959	£825	£6,850
W. Hopkins	3,700	2,100	1,000	6,800
Coulson & Lofts ..	3,640	2,016	946	6,602
Cubitt & Gotts	3,390	2,240	885	6,515
Potter & Son	3,196	2,185	1,070	6,450
Smith & Son	3,465	2,005	977	6,447
Parren & Son	3,474	2,014	916	6,404
J. McKay	3,398	1,989	972	6,359
F. Johnson	3,390	1,900	897	6,187
F. & E. Davey, Ltd.	3,408	1,843	891	6,142
Scales & Robins ..	3,300	1,830	865	5,995
Redding & Son	3,328	1,816	830	5,974
H. J. Linzell	3,285	1,844	836	5,964
S. E. Moss & Co...	3,197	1,836	876	5,909
A. R. Whur	—	—	—	5,895
Everett & Son	3,230	1,795	840	5,865
E. West	2,893	1,976	875	5,744
A. Suckling & Co...	3,130	1,820	750	5,700
C. Roper	2,998	1,845	850	5,693
G. Sharp	3,037	1,646	810	5,493
Mason & Son, Haverhill*	2,889	1,667	799	5,355

[Architects' estimate, total £5,450.]

HOUNSLOW.—For making-up Park and Dean roads for the Heston and Isleworth Urban District Council Mr. P. G. Parkman, Engineer, Town Hall, Hounslow W.:—

T. Adams, Wood Green* { Park-road	£578
{ Dean-road	818

HOUNSLOW.—For sewer works, Watson's-lane, Heston; Whitton Dean, Hounslow; and Kingsley and Heston roads, for the Heston and Isleworth Urban District Council. Mr. P. G. Parkman, Engineer, Town Hall, Hounslow, W.:—

Watson's-lane.

T. Chapman, Hounslow*	£594 10 0

Whitton Dean.

T. Watson, jun., Southall*	3,162 0 0

Kingsley-road.

T. Chapman, Hounslow*	2,212 11 0

HULL.—For the erection of riding school and headquarters of the Hull (A.) Squadron of the East Riding of Yorkshire Imperial Yeomanry, for Lieut.-Col. the Right Hon. Lord Wenlock, V.D., the officer commanding. Messrs. Thompson & Kirton, architects, Exchange-buildings, Lowgate, Hull. Quantities by the architects:—

Bowman	£1,825	0	0
Arnott	1,784	11	0
Jackson & Son	1,704	18	3
Longden	1,695	0	0
Kaye	1,680	0	0
G. Houlton ..	1,678	0	0
Good & Son, Ltd.	1,675	0	0
G. L. Scott ..	1,650	0	0
V. Knowles ..	1,647	4	2
F. Beilby	1,633	0	0
F. Southern ..	1,589	12	6
Hebblewhite & Wilson	1,584	0	0
Morrel & Son	1,580	0	0
Stephenson ..	1,578	0	0
T. Grates & Son	£1,568	0	0
Vickerman ..	1,567	0	0
J. Wilson & Son	1,562	0	0
J. Bilton	1,551	14	7
F. Bilton	1,533	0	0
F. Singleton ..	1,500	0	0
J. Taylor & Son	1,499	7	0
F. Blackburn & Son	1,496	0	0
T. J. Windass, 307, Hessle-rd., Hull* ..	1,466	2	6
J. R. Woods ..	1,434	0	0

ISLE OF WIGHT.—For additional drainage and other works, Oakfield Estate, East Cowes, for the Isle of Wight Land Company. Mr. William Burrough Hill, F.S.I., architect and Surveyor:—

Douglas & Richards	£442 2 0
W. G. Thomas	379 0 0
J. Butt, Southampton*	293 10 8

KETTERING.—For pair of houses, Morley-street, for Miss M. Waterman. Messrs. Bird & Batley, architects, Gold-street-chambers, Kettering:—

W. Riddle	£629	10	0
S. Manton	608	0	0
C. Andrew	586	0	0
A. Lewin & Son	£579	0	0
Smith, Edmunds, & Co.*	565	0	0

LONDON.—For woodpaving works, Netherwood-road and part of Richmond-road, for the Hammersmith Borough Council. Mr. H. Mair, Borough Surveyor, Town Hall, Hammersmith:—

T. C. Starkey ..	£4,789	11	6
J. Mowlem & Co., Ltd. ..	4,719	0	0
D. R. Paterson	4,701	3	4
B. Nowell & Co.	4,554	19	2
The Improved Woodpaving Co., Ltd. ..	4,484	7	0
G. Wimpey & Co.	£4,443	13	1
Acme Wood-Flooring Co., Ltd.	4,406	16	2
P. Smith	4,184	19	6

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LONDON.—For sewer work, for the Holborn Borough Council. Mr. G. Wallace, Borough Surveyor, Municipal Offices, 197, High Holborn, W.C.:—
D. R. Paterson, Bewlay Cliff Wharf, Camden Town £3,610 3 8

LONDON.—For small warehouse on the site of No. 12, Lant-street, and No. 2, Bittern-street, Southwark. Mr. G. A. Lansdown, architect, 9, Regent-street, Waterloo-place, S.W.:—

Joselyn & Young..	£2,570	H. Line	£2,100
Spiers & Son.....	2,387	W. Vogel Goad....	2,090
G. Newton.....	2,350	Sims & Woods	2,075
W. Hooper	2,300	Johnson & Co.	2,073
B. & A. Gale.....	2,299	R. Ward & Son ..	2,071
S. Polden	2,256	W. Downs	2,060
B. E. Nightingale..	2,222	Hibberd Bros., Ltd.	2,028
Kirk & Kirk	2,177	C. King	2,000
Grout Brothers ..	2,167	J. Parsons.....	1,993
Ford & Walton, Ltd.	2,165	T. G. Sharpington..	1,980
W. O. Collingwood	2,124	C. R. Price.....	1,957
Foster Brothers ..	2,124	R. & E. Evans* ..	1,908

LONDON.—For making borings necessary near the sites of certain works proposed for the relief of floodings in Hammersmith and North Kensington, for the London County Council:—

Docwra & Son ..	£242 1 6	Le Grand & Sutcliff, London*	£133 19 0
Baker & Son....	181 2 0		

LONDON.—For a pair of new propeller shafts for use on the s.s. *Burns*, for the London County Council:—

J. Spencer & Sons, Ltd.	£141 0 0
W. Beardmore & Sons, Ltd.....	140 0 0
Vickers, Sons, & Maxim, Ltd.....	136 10 0
Darlington Forge Co., Ltd.	125 0 0
North-Eastern Marine Engineering Co., Ltd., Wallsend-on-Tyne* ..	100 0 0

LONDON.—For electric jib crane, Greenwich generating station, for the London County Council:—

G. Russell & Co., Ltd.	£4,548 17 0
Cowans, Sheldon, & Co., Ltd. ..	3,402 0 0
J. Booth & Bros., Ltd.	3,334 0 0
Jessop & Appleby Bros., Ltd. ...	3,111 10 0
Ransomes & Rapier, Ltd., London*	3,105 0 0

SOUTHAMPTON.—For alterations to the auction mart, No. 17, Above-bar, for Messrs. Perkins & Sons. Mr. William Burrough Hill, F.S.I., architect and surveyor:—

H. Stevens & Co. ..	£1,750	J. J. Udall & Co. ..	£1,696
C. Barter.....	1,728	Jenkins & Sons* ..	1,674
H. Cawte.....	1,710		

[All of Southampton.]

TILBURY.—For building houses at Tilbury. Mr. Christopher M. Shiner, architect and surveyor, 6, 7, and 8, Crutched Friars, London, E.C.:—
Mr. G. Brown .... £1,170 | Mr. G. W. Cooke* .. £1,149

WALLASEY.—For making part of Oakdale-road, Seacombe, between Dock-road and Wirral Railway, for the Wallasey Urban District Council. Mr. W. H. Travers, Engineer and Surveyor, Public Offices, Egremont:—
J. McGeoch, Egremont* £727 16 11

WALTHAMSTOW.—For alterations and additions, Higham Hill Infants' School, for Walthamstow Education Committee. Mr. H. Prosser, architect to the Committee:—

R. & E. Evans	£2,278	Sands, Palmer, & Co.	£2,050
A. G. Barton.....	2,215		
Pollard & Brand ..	2,168	J. & J. Dean*	1,769

WALTHAMSTOW.—For new cloakrooms and out-offices, Markhouse-road girls' and infants' schools, for the Education Committee. Mr. H. Prosser, architect:—

A. G. Barton £513	0	J. & J. Dean £446	0
Pollard & Brand .. 496	0	Sands, Palmer, & Co.*	438 10
R. & E. Evans .. 449	0		

WALTHAMSTOW.—For isolation stables, for Walthamstow Urban District Council. Mr. G. W. Holmes, Borough Engineer:—

A. G. Barton..£1,357	0 0	Rowley Bros. .. £900	0 0
C. W. Camp .. 1,226	0 0	Crabb & Son .. 899	0 0
R. Goodman & Sons 1,020	0 0	J. N. Saunders.. 885	10 2
J. W. Abbott.. 985	0 0	West Bros. & Pettit 861	0 0
W. J. Maddison 959	0 0	J. A. Reed*.... 841	0 0
S. J. Scott.... 920	0 0	Fasey & Morton 820	0 0
S. & J. Dean.. 907	0 0		

WEALDSTONE.—For street works, Salisbury-road and part of Buckingham-road, for the Urban District Council. Mr. H. Walker, Surveyor, Council Offices, Wealdstone. Quantities by Surveyor:—

	Salisbury-road.	Buckingham-rd. (portion of).
H. Brown	£1,210 0 9 ..	£246 19 2
Harvey Bros.	1,444 1 10 ..	291 0 3
A. B. Champniss, Wealdstone*.....	1,224 9 5 ..	247 10 7
Nowell & Co.	1,498 6 7 ..	313 1 4
Greig & Matthews ..	2,011 18 11 ..	400 15 0
Free & Sons	1,342 14 6 ..	289 2 9
T. Adams	1,298 19 0 ..	271 4 11
F. Fowles	1,363 0 0 ..	290 0 0

WESTON-SUPER-MARE.—For the erection of a warehouse in Station-road, for Messrs. Lalonde Bros. & Parham. Messrs. Hans Price and W. Jane, architects, Waterloo-street, Weston-super-Mare. Quantities by architects.—

H. A. Forse & Son.....£3,050	0 0	G. Sprake £2,483	9 7
E. J. Lye 2,998	10 0	G. & J. E. Stokes 2,340	0 0
W. F. Drew .. 2,850	0 0	C. & E. Stradling, Weston-super-Mare* 2,197	17 0
C. Addicott .. 2,575	0 0		
C. Taylor 2,544	0 0		
Gleed Bros. .. 2,489	0 0		

WIGSTON MAGNA.—For the supply of broken granite, for the Urban District Council. Mr. W. G. J. Clark, Surveyor:—
C. J. Dawes & Son, Public Wharf, Leicester; Enderby & Stoney Stanton Granite Co., Ltd.; Forest Rock Granite Co., Ltd. ..... } At per schedule.

Ventilating skylights, etc., Gainsborough-road School, Hackney Wick.—In the list of tenders for this work, published in our last issue, p. 349, we stated that the tender of Messrs. J. Willmott & Sons, of Hitchin, was 217*l.* We are informed that the amount of their tender was 417*l.* The mistake was not ours.

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The Builder.

VOL. LXXXVI.—No. 3192. APRIL 9, 1904.

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Design for Façade to Post Office, Lahore ..... By Mr. M. Starmer Hack, A.R.I.B.A.
Entrance to New Library, Keighley ..... Messrs. McKewan and Swan, Architects.
Houses, High-street, Marylebone ..... Mr. W. M. Brutton, Architect.
Moss Cottage, Pinner ..... Mr. W. H. Seth-Smith, F.R.I.B.A., Architect.
Business Premises, High Holborn ..... Mr. A. Sykes, A.R.I.B.A., Architect.

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The Baltimore Fire and its Lessons.

THE great Baltimore fire was the result of certain untoward circumstances which, combined, had the effect of destroying the principal business quarters of that city, to the entire disorganisation of business and with great monetary loss to all concerned. Such a combination of adverse circumstances is one from which London has generally been free, partly thanks to the careful administration of the old Building Act, partly owing to the excellent work of the Fire Brigade throughout Sir Eyre Massey Shaw's reign at the Southwark Bridge-road headquarters, and partly to the good fortune of London seldom having two serious outbreaks at the same time, and scarcely ever having a gale of wind during an outbreak or a serious explosion in the early stages of a fire.

The advantages of the excellent administration of the old Building Act, and the present and future administration of the law as it now stands and as it is to be amended, should not blind us to the lessons to be learnt at Baltimore from the building officials' point of view. Similarly the excellence of our fire service in Sir Eyre Massey Shaw's time, and the efficiency and good management which we are convinced we shall obtain under the present Chief Officer, Captain Hamilton, must not blind us to the Fire Brigade aspect of the Baltimore conflagration, more particularly as London was subject to some very serious fires during the interregnum of the two chiefs named.

Explosions will happen and gales will spring up, and circumstances will combine to complicate an outbreak of fire even in the best-managed of cities. Though our legislators may ride the high horse and state that a catastrophe such as that of Baltimore would be impossible in London, we regret to differ, and to state that, given similar circumstances—namely, an explosion in a very large building to start the fire, and a gale of wind to fan it—there are a number of districts in the Metropolis which would be entirely devastated, both in the historical square mile and in the West End, in spite of the protection available through the Building Act and the efforts of the Brigade. The inferior construction to be found in many districts in which a most inflammable stock is sold, and the utter disregard of that great fire risk involved in windows overlooking mutual areas or facing narrow thoroughfares and alleys, will on such an occasion discount the effect of the existing building regulations and of any Fire Brigade work.

In brief, the direct cause of the fire at Baltimore was a small outbreak in Hurst's building, followed by an explosion in the upper story of this building which spread the fire to adjoining property, the flames being fanned by a strong wind. The surprise and temporary disorganisation of the Fire Brigade, caused by the explosion, affected to a certain degree the handling of the fire. Fanned, as indicated, by the wind, and facilitated by a great disregard to party walls in the district in question and the great stock of highly-combustible contents, the fire spread with almost unheard-of rapidity. The obvious mistake of dynamiting property was then resorted to in the panic of the authorities, with the result that the contents of many of the minor buildings were spread in such a way as to assist the development of the conflagration. In fact, had it not been for some modern fire-resisting buildings on one of the boundaries of the fire area, combined with some old monumental buildings, such as the Courthouse, the Post Office, and the City Hall, and had it not been for a harbour basin on the second boundary and a river on the third, everything in the city to the lee side of the wind would inevitably have been destroyed. In other words, some well-built structures, a waterway and a river, formed the fire stops; and although these fire stops were supplemented by the work of innumerable fire brigades drawn from surrounding districts, and even from as far as New York, over 500 miles away, the efforts of the fire brigades in themselves would not have been effective without the fire stops to aid them.

The principal lesson thus to be learnt from Baltimore is that as long as ordinary forms of internal construction are in use, and the risk of the vertical opening is disregarded, the conflagration hazard is a very considerable one.

The vertical division of blocks of buildings is the *sine qud non* of fire protection. Next, however, to the main principle of vertical division comes the question of construction, and here we find the most important point to be the maximum division into a number of small risks of the vertical and horizontal divisions that are fire-resisting, and in order to obtain these divisions it is essential in the first instance that all

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iron work and all steel work should be thoroughly well protected with non-combustible coverings at least 2 in. thick, and that no metal structural work, however trivial, be left exposed to fire.

It has been amusing to read the comments of an ill-informed daily press regarding the failure of the fire-resisting buildings at Baltimore, when with independent notes and photographs before us we see that Baltimore has served as the great example to the whole world of what modern fire-resisting construction will do under the severest of tests. The fire-resisting building of modern design, with its steel work duly protected, has withstood the fire to an extent that has far surpassed the expectations of the most enthusiastic admirers of modern forms of fire-resisting construction. Protected steel work and concrete floors have practically gained a victory which no amount of writing, lecturing, or experimenting would have obtained for them. The modern building of fire-resisting construction stands in amongst the ruins of Baltimore as a monument to the foresight of those who have foretold by aid of experiments what a building will do if carefully designed and suitably protected. In these modern buildings the entire contents and every particle of woodwork in fittings and furnishings have been burnt out, or, one might say, swept out, inasmuch as the contents have not only been burnt out, but the ashes have been swept away by the draught created during the fire. The plain carcase alone stands, with its floors, partitions, and verticals generally intact, and its metal work as a rule absolutely firm and true. Only in some instances, where the tile work has been too thinly and unsuitably applied to the lower flanges of the girders or around the stanchions, has the tile work disappeared in part or whole, with the result that such girders have deflected and the columns perhaps buckled.

To put it in plain figures, however, quite 50 per cent. of the value of these modern structures has been saved by careful construction, and it is now only a question of repair and rapid reinstatement and not a question of re-erection.

To repeat—as far as these modern buildings are concerned, nothing has escaped, with the exception of the brick walls and such of the metal work as has been duly protected by concrete, brick, or thick terra-cotta. All classes of stone containing lime are disintegrated, and most of the plaster and wire partitions are broken down and useless, as was only to be expected, seeing that they were only intended to afford temporary or at the most partial protection as distinct from full protection against fire, as "full" protection is generally understood. The only thin partitions that have escaped in part were those of brick, porous brick, and terra-cotta. Regarding floors in these buildings, where concrete has been used there is practically very little damage, whilst where terra-cotta blocks have been used the lower web has generally come off, so that the floors will have to be replaced by new ones. Where steel work has been protected by terra-cotta, unsuitably applied, instead of by concrete it has been frequently entirely denuded of this so-called protection, and, as was anticipated by those who knew best, the protection afforded by well-made concrete gave least cause for complaint.

To quote an American correspondent, "the tile advocates have been badly beaten, and no amount of advertising will give them back the position they previously held." In other words, our leading authorities on fire protection in Europe have been correct in their prognostications, and the conversion of our own Office of Works to concrete floors in the new Government buildings in Whitehall has been most judicious. It would be well if other public departments would also soon follow suit, so that Government property should be no longer subject to the unnecessary risk of unreliable horizontal division in the form of tile floors, the form of which, as adopted, appears to be one of the few that have so far not been reliably investigated in London and appears to have played a somewhat unsatisfactory *rôle* in an official New York test, of which we find particulars published in an American engineering contemporary.

Ferro-concrete appears to have also come out of the Baltimore fire in a satisfactory manner where the metal rods were sufficiently protected by the concrete, and this remark refers to its use vertically for walls as well as horizontally for floors.

In the monumental buildings of the older type granite appears to have been the most treacherous of the building stones employed, and the older brickwork at Baltimore was certainly not found to be as fire-resisting as our brickwork here.

Turning to matters of detail, it may be of interest to name the steel frame buildings which were constructed on modern lines and were involved in this conflagration. There was the Continental Trust building at the corner of Baltimore and Calvert-street; then the Equitable building at the corner of Calvert and Fayette-street, next the Calvert building at the corner of Fayette and St. Paul's streets; the Union Trust building at the corner of Charles and Fayette-street; the Maryland Trust building at the corner of Calvert and Jermyn-street; the Herald building at the corner of Lexington and St. Paul's-street; and, lastly, the Merchants' National Bank in Water-street. It is a curious factor that nearly all these more important buildings of modern construction were corner buildings, and thus subjected to the additional hazard of having two frontages.

Regarding the Equitable building, this was a steel skeleton structure of ten stories, built in 1892, and the worst damaged of this series. The floors were of terra-cotta, and from top to bottom every floor panel, for about half the area of the building, had collapsed. The steel framework, which was stoutly protected, however, stood very well as far as the vertical supports were concerned, and fairly well as regards horizontal beams. The structure need not be razed for reconstruction, but can be repaired. Had it not been for the terra-cotta flooring adopted in this building there would not have been any reason for complaint, having regard to the fact that the building dates back a whole decade.

The Calvert building is three years old. It shows an unusually heavy form of terra-cotta fireproofing and protected steelwork. It came through the fire in what might almost be termed perfect condition, except for the failures in connexion with the terra-cotta fireproofing and a buckled column on the first floor where the terra-cotta had fallen. Regarding the terra-cotta flooring, although of unusually heavy construction, it has been so damaged as to require a considerable amount of reinstatement, entire floor panels having their bottom webs destroyed and the vertical webs cracked or broken. The net result, however, is that the steel work, with the exception of one column, can stand.

The Union Trust building and the Maryland Trust building are very much alike, and show similar construction. They are both four years old, eleven stories in height, have the lower portion of the façade in stone and the upper portion terra-cotta. The terra-cotta façade is apparently chipped and broken in many places. The stone façade is, however, chipped and cracked very seriously. The steel work, having been protected, has stood the fire exceedingly well. On the other hand, the terra-cotta floors will have to be for the most part reinstated, owing to defects similar to those in the previous building.

The Continental Trust building has sixteen stories. It was completed about eighteen months ago, and embodied the most up-to-date American methods. The column protection here remained intact throughout. The floors, however, have shown the same defects as before, *i.e.*, the numerous breaks on the lower webs of the tiles; but no floor panel has in this case come down bodily. Reconstruction of the floors will, we expect, be necessary.

To go on with further descriptions in an article of this kind would scarcely be worth while, seeing that the general lessons of the conflagration only are to be recorded. But there is already a very plain lesson to be learnt from the few particulars presented, and that is that good systems of concrete flooring are more reliable than tile flooring, and that of the proprietary systems the terra-cotta systems, unless materially improved, will gradually find themselves superseded. That the Americans had already recognised this to a certain extent prior to the Baltimore fire can be seen from the recent strenuous efforts to obtain a kind of reinforced terra-cotta floor. Several experiments had already been made with these, and seemed to show that the idea is deserving of development.

For the impending Building Act Amendments the experience at Baltimore should be borne in mind, and the protection of steel work be made compulsory, and the hollow floor excluded from buildings that are really intended to be fire-resisting, such as the buildings of the warehouse class. For separation purposes under the Building Act, in buildings partially used for tenements and partially used for trade, the solid floor should also be made an essential. Those who redraft the Building Act would do well to study the lessons of this great conflagration at Baltimore and other

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recent experience at notable fires, for, combined with the results of the investigations so systematically carried out in this country of late years, the true limitations of certain systems of construction can now be traced, whilst the advantages of others may at last be said to stand as proven.

THE DIMENSIONS OF TEST BARS.

QUITE apart from the differences of tensile resistance shown by test bars of varying length, the variation of the percentage of elongation with test bars of different gauge length and sectional area requires careful attention. So far as ultimate strength is concerned, it is found that when the smallest part of the section of a test bar is very short a much greater stress can be resisted than when a long parallel rod of similar material is tested. In one case the greater breaking load is attributable to restriction of the flow of metal and in the other less than the normal strength is usually evidenced owing to the existence of weak places, and the longer the rod the more chances there are of weak places. With regard to the percentage of elongation, which is the measure of ductility, we must remember that for any given test bar the elongation in a given gauge length is made up of two parts:—(1) That due to general extension between the gauge points, and (2) that due to local contraction, which is practically independent of the gauge length. It has been known for some time that the percentage of elongation diminishes for any given size of bar as the gauge length is increased. But a fact not so generally recognised is that the elongation due to local contraction depends upon the cross sectional area of the test bar, and, consequently, that for a given gauge length the percentage of elongation varies with the cross section of the bar and increases for a given gauge length as the cross section increases. Some useful data with regard to the influence of gauge length and sections of test bars on the percentage of elongation are to be found in the recently-published report by Professor Unwin. This report gives the results of tests undertaken at the request of the Engineering Standards Committee. The tests cover a wide range of conditions, and the data obtained therefrom constitute a most valuable record upon the subject generally.

When measured on constant gauge length and constant area the elongations were such that the following conclusions could safely be drawn as to the real relative ductility of the plates tested:—(*a*) The *relative* ductility is practically the same, whether the test bars are 1 in. or ½ in. area. (*b*) The mean difference of percentage of elongation is 2·6 per cent. for ship plates and 2·9 per cent. for boiler plates. (*c*) Plates below ⅜ in. thick have less ductility than thicker plates. (This indicates that a special rule is required for plates less than ⅜ in. thick.) (*d*) For plates over ⅜ in. thick ductility diminishes as thickness increases. (Hence a special rule may be required for plates more than ⅞ in. thick if standard test bars have constant area.) (*e*) The falling off of ductility with increase of thickness is less in boiler plates than in ship plates, so that, while ⅜ in. boiler and ship plates have approximately the same percentage of elongation, 1¼ in. boiler plates have about 5 per cent. more percentage of elongation than corresponding ship plates. Some further data obtained from tests of annealed and unannealed plates with varying percentages of carbon throw useful light on the question of the variation of elongation, both with variation of section and variation of hardness. Further, it is interesting to observe that since the report was written Professor Unwin has found a general relation between the percentage of elongation and gauge length and cross section of bar. Thus, if e is the percentage of elongation in a gauge length l for a bar of the cross section A, we have

$$e = \frac{c\sqrt{A}}{l} + b$$

where the first term on the right is the elongation percentage due to local contraction, and the second is the percentage of general elongation, c and b being constants for any given quality of metal.

NOTES.

Workmen's Compensation.

IT is not, we think, surprising that the rates charged for insurance under the Workmen's Compensation Act have considerably increased. It was quite natural, apart from rate cutting, that the insurance companies should quote at the outset low rates. They desired to attract custom, and the extent of their liability was unknown. Some trust was placed in Mr. Chamberlain's estimate that the charge per cent. for insurance would in many trades not exceed a shilling per cent., but this estimate was mere guess work. With a simplification and enlargement of the acts in regard to workmen's compensation it is possible that there may be some lowering of rates, for there is an immense amount of money spent by the insurance companies in litigation which has to be taken into account in the rates. An extension and systematising of the acts may therefore benefit workmen, employers, and insurance companies. One thing, however, is certain; that whatever be the rates, the insurance business will increase. It is only a very large concern which can have its own insurance fund, and there is also much convenience in handing a claim over to a company and so incurring no further expenditure of time or money.

Proposed London Main Avenues.

DURING the sittings of the Royal Commission on London Traffic various refreshingly simple proposals have been made, many of them excellent in their way, but all involving expenditure on so huge a scale as to render their adoption highly improbable, not to say impracticable, under existing circumstances. A series of suggestions recently made by Messrs. C. S. Meik and Walter Beer are in every way commendable in theory, but, as the total amount of capital required is estimated at about 150,000,000*l.*, it is difficult to see how they could be seriously entertained, except by an all-powerful body created and financed by Imperial Parliament. Further, the scheme in question merely relates to the construction of four main avenues passing from north to south and east to west, with various branch roads, an embankment between Waterloo and Blackfriars bridges, and a bridge to carry one of the new avenues over the Thames. The suggestion is that each main avenue should be 160 ft. wide and twelve miles long, commencing in open country and meeting in Clerkenwell. These avenues would be double-decked in town sections—the upper deck elevated above ground level—and single-decked in country sections. According to the printed designs, the accommodation in town sections provides for a double-track suspended railway, two tramway tracks, two carriage ways, and two footpaths on the upper deck; and for a motor road, two van roads, and two footpaths on the lower deck. The upper road would be regarded as the main avenue proper, the lower road being intended to keep motor vehicles out of the way and to facilitate the delivery and collection of goods without interfering with traffic. In country sections the upper deck would be brought down to ground level, providing the same accommodation as that on the elevated deck of the town sections. Up and down traffic approaches would give access from existing streets to the upper decks of the new main avenues, and it is suggested that tube railways might be constructed below the avenues. The proposed branch roads are intended to bring traffic into the main avenues from surrounding districts. These suggestions are apparently based on American practice in bridge design, but we are by no means clear that the partial gloom of the lower deck would be popular with the drivers of motor vehicles and vans, and unless a large force of police were provided to compel the use of the lower road by certain classes of traffic, we fear it would be very little used. The financial success of the enterprise is another element that would require the most serious consideration, and, regarded from this aspect, we fancy the scheme will offer little temptation to the heavily burdened ratepayers of the Metropolis.

British Timber and its Uses.

MANY of our readers will no doubt have carefully read the paper on "British Timber and its Uses" which was recently read at the Surveyors' Institution and was published in an abbreviated form in the *Builder* of March 5, the discussion thereon being reported in the number of March 26. But at the present moment, when spring is advancing, it appears desirable to call attention more particularly to the subject, since for the next six months our readers can study it for themselves. It is obvious that England is generally too much cultivated and too closely inhabited to be a country which can produce timber in large tracts. On the other hand, it is obvious that in the aggregate Great Britain can produce quantities of useful timber without injury to the beauty of the country. In other words, ancestral oaks and beeches need not be destroyed for business purposes. More care is needed of small woodlands and of hedgerow timber. A row of elms, for example, is cut down by a proprietor, sold, and turned into cash, but he does

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not systematically replant. Trees are often left too long, with the result that they are destroyed by gales or rot away, and so are lost to the landscape, when by being felled at an earlier age and replaced, the landscape would never have been deprived of their greenery. In fact, the majority of English landed proprietors neglect their trees, and many who actually give some thought to the matter plant coniferous trees indiscriminately and quite overlook the deciduous forest trees. The whole subject requires public attention and study.

Electric Fatality.

THE lamentable accident by which Mr. George Crates, a young electrical engineer employed by the Charing Cross and Strand Electric Light Company, lost his life last week is deeply to be regretted. The engines had been shut down at the generating station and the voltmeter was reading zero when Mr. Crates started to remove nine of the fuses from the switchboard in order to cut off a particular section of the supply net-work for necessary repairs. He removed six of the fuses safely, but when in the act of removing the seventh there was a flash and a report, and he fell on his back with the fuse in his hand and died shortly afterwards. The doctor stated at the inquest that his face was scorched and his hair singed and that his death was due to electric shock. The engineer-in-charge stated that the occurrence was inexplicable, and suggested that it must have been a "static" charge. In our opinion, judging from the evidence given at the inquest, the shock must almost certainly have been due to a static discharge. There must have been a considerable quantity of electricity stored up at a high potential, and, therefore, one of the cables must have retained its charge after the machines slowed down. This may have been due to one of the fuses not making connexion or to one of them not being in its place. A cable under these circumstances simply acts like a Leyden jar of enormous capacity, and the shock from it might often be fatal. The length of time a cable can retain most of its charge under working conditions is sometimes two or three hours. Mr. Swinburne constructed electric lighting condensers at Teddington which retained their charge for three weeks. We have known of two cases where severe shocks have been accidentally received from a static discharge left in a cable. In most stations where such an occurrence is possible it is the rule to discharge the cables after the machines have been shut down. As to possible dangers from shock due to static charges, a word of warning ought to be given to those who use condensers in connexion with single-phase alternating current motors. If the condenser is not discharged after the motor stops it is a source of danger to the electrician in charge.

Decoration of a Communion Table.

A CURIOUS case was heard before the Consistory Court last week, in which the Rector and Churchwardens of St. Luke's, Chelsea, sought permission to decorate the Communion table with a memorial design in coloured marble mosaics on a ground of thin slate slabs hung to the woodwork of the table by screws. The first demand had been for permission to have a marble table placed on castors, so as to be movable, in order to comply with the ecclesiastical law which forbids a fixed altar. This apparently was not accepted, and the demand was then made for permission to affix a decorative mosaic design to the woodwork by screws, so that it should be removable. "The mosaics would be suspended on large wooden screws, and would not be cemented or made otherwise adhesive in any way to the holy table." The cubic capacity of the wood, it was stated, was 28 ft., and the other material did not include more than 4 cubic feet; so that, it was argued, this was essentially a wooden table. The Chancellor of the Diocese admitted the argument and sanctioned the table in this form. With the ecclesiastical law we are not concerned, but in other respects it seems to us to have been rather a foolish business. Mosaic is essentially a form of built-in ornament, and to hang it on removable slabs is a contradiction of its proper character, and in fact is a kind of decorative sham, quite at variance with the idea of a table. Since ecclesiastical law prescribes a table and not a fixed erection (for a reason which is perfectly logical and comprehensible), we cannot see any sense in trying to decorate it so as to make it appear what it is not, and is not permitted to be.

Advertisement Regulation in New Zealand.

WE are glad to hear from a correspondent in Christchurch, New Zealand, that the policy and the publications of the "Society for Checking the Abuse of Public Advertising" are not unknown in that colony, and have not been without their effect. They have had, we are told, considerable influence in inducing the Government of New Zealand to place on their statutes the following amendment to the Municipal Corporations Bill:—

Regulating Public Advertising.

"(*e*) For regulating, controlling, or prohibiting the display upon or over public buildings or bridges, or upon or over buildings, walls, fences, lamp-posts, pavements, or hoardings situated in or upon or adjoining any land or street, the property of the Corporation, or under the control of the Council, or the display in any manner so that it shall be visible from any such street or public place, of posters, placards, handbills, writings, pictures, or devices for advertising or other purposes."

It is gratifying to find that this movement is progressing in the Colonies, though it makes one ashamed of England that action in the same direction should be here so slow and less than half-hearted. Is there not at this moment to be seen a whole street front covered permanently with advertisements next door to Wren's great church in Cheapside—a standing disgrace to the City?

CHILDREN'S DRAWINGS.

THE Exhibition of the Royal Drawing Society, at 50, Queen Anne's-gate, is one of unique interest and value, illustrating, as it does, the free expression of natural art. The pictorial art of children from the early age of 2½ years to the more mature students of 19 years, is there expressed in the mediums of their own choice, and in the manner of their own inspiration. Their technique is their own, and is preserved from the influence of "style." The art director, Mr. T. R. Ablett, leads his pupils by a system which is based on self-initiation. Commencing with the fundamental truth, that all humanity is endowed with a certain pictorial talent, the pupil is assisted in the development of his powers of observation and imagination on the lines in which he is inspired. The success of this system is proved by the extraordinarily high standard of many of the drawings, which show a vigour of imagination and an illustrative power that are surprising.

The subjects are mostly drawn from memory. By encouraging observation and the natural tendency of children to draw objects of interest, and by a system of "snap shot" drawings, i.e., drawing from memory a subject which has only been exposed for one second—the power of observation in detail is developed hand in hand with that of expression. Mr. Ablett also teaches by correspondence, and many of the most successful drawings have been done by the pupils thus taught. The earliest efforts of a child are usually shown by a surface description, the tendency to express texture coming before the feeling for line and form has been developed; and the steps of progression can be clearly followed in the work on exhibition.

It is significant that the drawing of animals by the youngest pupils is invariably superior to that of the human figure.

By last year's report, 23,700 papers were received from 470 schools. The youngest artist is Miss Joyce Egerton Lowe, aged 2½ years, and the subject drawn is a girl wearing a fur coat and a large hat. The texture of the fur, and the form and proportions of the hat, have chiefly interested this youthful observer. The landscape pencil drawings by Master David Staines, aged 6, are promising efforts at surface description, and show considerable feeling for form and composition. The work of Master Kenneth Shoesmith, aged 13, consists of drawings of sea and boats, and shows the keenest observation, with an ability to express form and surface; perhaps most successfully shown in a drawing of the swirling wash of a tug wheeling into position.

The prize given by the President (the Princess Louise) for girls is won by Miss Phyllis Buckland (10), with vigorous pencil drawings of a canal horse in yoke and out of it, drawn from memory, with astonishing appreciation of the varying muscular action in loaded movement and free movement.

The prize for boys is gained by Master G. Humphray S. Dixon (10-12), with a delightfully humorous set of pen drawings of a spontaneous decorative character.

Mr. G. F. Watts's prize is halved between Miss Eileen Hood (11) and Miss Margery Hood (15), sisters. The former has drawn a set of dog studies with wonderful directness, and is equally happy in her "imagination" subject, "Bringing in the Stragglers," in which the spirit of action is cleverly expressed. The work of Miss Margery is of a different nature, and belongs to indoor life, expressed by careful drawings of figures drawn with true feeling.

The winner of the R.D.S. Gold Star—Miss Magery Gough (14)—revels in the imagery of a fairy dream, illustrated by a set of clever pencil drawings. Master Brian Hatton's (14) Knight in Armour is a pen drawing which would be a credit to any artist.

Sir Jas. Linton's and Mr. Ablett's prizes are won by Miss M. Wood (19), with a series of brush sketches of children, delightfully fresh and direct, and expressing all the charm of children in the simplest way.

LITTLE WILD-STREET CHAPEL.—An order has been made by Mr. Justice Joyce, in response to the trustees' petition, for the payment to them of 7,000*l.*, together with leave to invest 3,865*l.* in respect of the St. Giles's Christian Mission to Discharged Prisoners, founded by Mr. George Hutton, of which the headquarters were established thirty-one years ago in the Baptist Chapel in Little Wild-street, Lincoln's Inn-fields. The chapel, recently demolished for the new street, Kingsway, was originally built there in the earlier half of the XVIIIth century. The London County Council paid as compensation a sum of 11,632*l.* 10s., and sold to the trustees for 3,865*l.* a fresh site for the erection, at an estimated cost of 7,000*l.*, of a new chapel and mission house. The new site consists of some 4,500 ft. superficial on the east side of Great Wild-street, at the corner of Wild-court. Messrs. E. Runtz and Co. have prepared the plans and designs for a mission chapel, with a capacity of 600 persons, and having a hall beneath. Dr. Gifford, the learned numismatist and librarian of the British Museum, was, until his secession in 1735, the pastor of the chapel in Little Wild-street.

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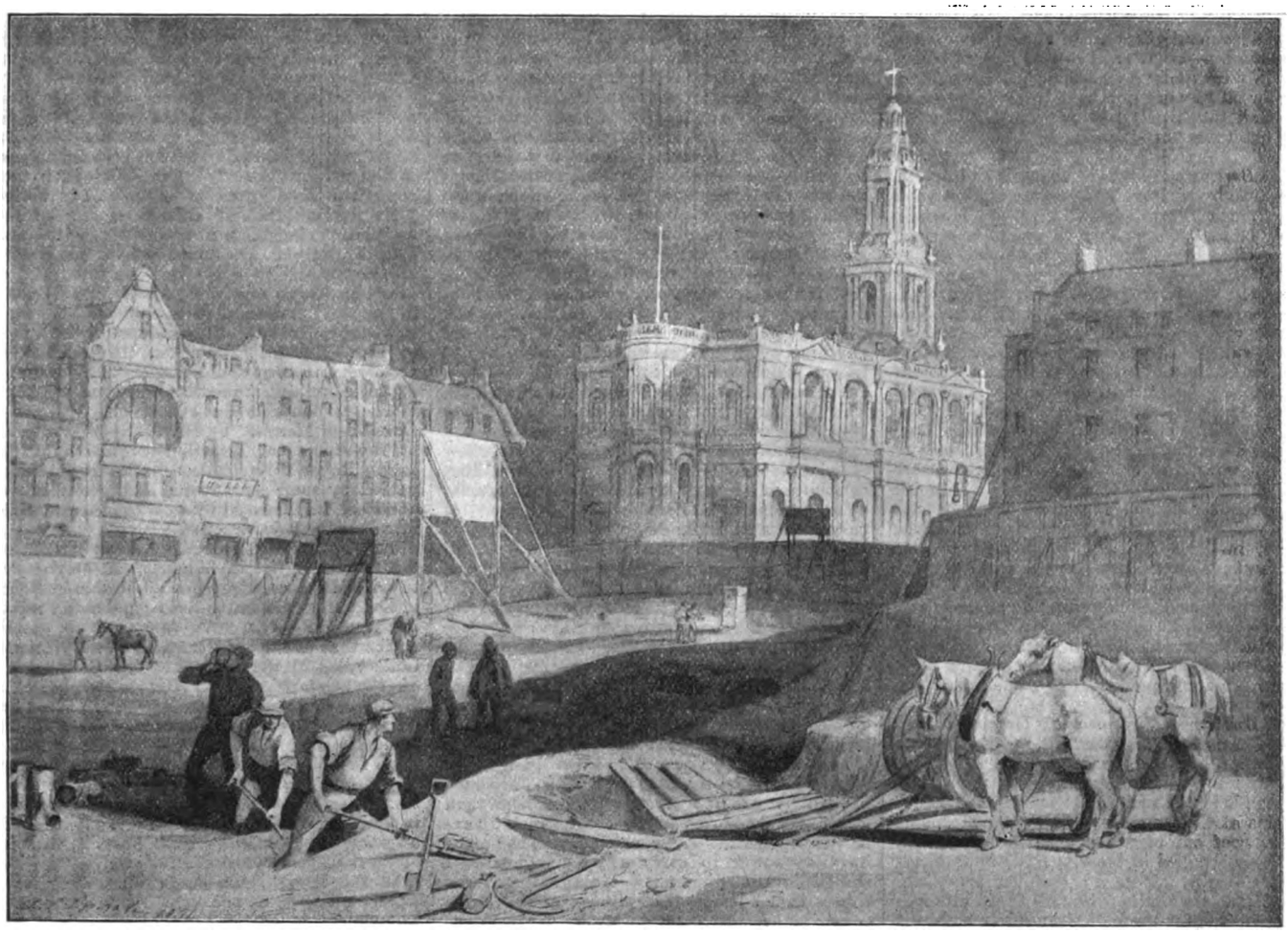

St. Mary-le-Strand: as seen at present from the cleared site north of the Strand. Drawn by Mr. A. C. Conrade.

NEW VIEWS OF OLD BUILDINGS.

The view of St. Mary-le-Strand here given is one that will only be visible during the period when the space cleared for the new buildings in the Strand and Aldwych is still open; it is a record, therefore, of what can only be temporary effect. It is from a sketch by Mr. A. C. Conrade.

MAGAZINES AND REVIEWS.

The now inevitable personal article in art magazines is supplied in the *Art Journal* of this month by an article on Professor Tuxen, best known in England as a painter of Court "functions," but who began with much wider views as to subject, as some of the illustrations here show—notably a very good composition on the hackneyed subject of "Susanna and the Elders"—a mere excuse, of course, for a nude study, which, however, is exceptionally graceful and well drawn; a kind of power which was perhaps the result of a three years' study in Bonnat's *atelier*. Three other articles are occupied with collections: "The Rijks Museum at Amsterdam," "Acquisitions to Public Galleries," and the Dutch pictures in the National Gallery of Scotland; followed by an article on Lawrence and the original prices and present values of his pictures. He obtained what were considered good prices in those days; but the "Miss Farren," for which he received 100 guineas, sold at auction in 1897 for £2,250. He secured a great rise in prices during his lifetime, however, for in 1802 his price for a full-length was £120, while in 1820 it had gone up to £600. It is mentioned that while there are three Lawrences in the Louvre, there is no example of either Reynolds or Gainsborough; an extraordinary discrepancy; but Lawrence was one of the English painters for whom the French in late years have taken one of their fits of idolatry. The most interesting article in the number to our readers is one by Mr. J. A. Gotch on "Modern Furniture," the numerous illustrations to which show in a convincing manner what an immense advance has been made in this country of late in the combination of good taste and beauty of decoration with sound structural method—qualities in which English furniture is now superior to that produced in any other country. Among the numerous examples illustrated there is not one that is not thoroughly good, except, perhaps, the grand pianoforte on page 134, which is rather poor and stiff in line and treatment. Mr. Gotch (and we quite agree with him) is in favour of retaining the influence of old forms as models to work upon, rather than striving after an "originality" which is likely to lead to eccentricity both of line and of structural design.

In the *Magazine of Art* we come upon Lawrence again, in the shape of a series of letters and diary extracts in regard to the sittings for and the progress of his picture of the two Pattison boys with a donkey, exhibited under the title "Rural Amusement." The memoranda are amusing, though their interest is not quite commensurate with the space they occupy. A letter of Crabbe Robinson's to one of the Pattison family, written after Lawrence's death, shows that he had a sound judgment in regard to the popular portrait painter, for whom he had a strong personal regard. "I doubt whether Sir Thomas Lawrence will be considered a great painter by posterity. I incline to think not, but he was at least a skilful and popular artist, who did better than all others what his rivals tried to excel in, and he who does that is no common man." It is not every one who can judge a contemporary popular artist so soundly and impartially. Mr. Val Prinsep concludes his reminiscences of Rossetti, which do not do much to raise Rossetti in one's estimation. We get the character of a man who was an out-and-out Bohemian, even to the extent of a normal state of untidiness in his dress and his house—something worse than untidiness, in fact; who was an enthusiast about art but would not really work hard at it, having an odd idea that pictures could be painted by force of genius without the study of technique; who was exceedingly keen at driving a bargain over his works, and who despised all artists except himself and his own particular set. "I have a curious letter from him to my father-in-law," says Mr. Prinsep, "in which he congratulates him on having got rid of a picture by Leighton, and also two Turners, and insinuating that he should not purchase such things." It is amusing to read of a young painter called "Ned Jones," who was one of the brotherhood of art, and who was afterwards to be known as "Sir Edward Burne-Jones" (so it appears that the hyphen was a later invention in the painter's name), and who shared with Rossetti the most absolute dislike to anything like physical exertion or athletics (we can quite fancy that); Mr. Prinsep went up the river with them once, but adds: "I need not say that neither Rossetti nor Ned touched an oar. They reclined in the stern while I did the work." Mr. Prinsep expresses the opinion (which we have long held) that Rossetti was not a painter who wrote poetry, but a poet who painted pictures; which just sums up the position. Some reproductions of "Turner Caricatures" by Thomas Fearnley are amusing, especially one showing Turner's short figure, in a hat and long coat, standing on a bench, painting a sunset which casts shadows from the actual objects in the room. The landscape called "A burlesque of Turner's work," should rather be called an imitation; it is exceedingly like some of Turner's Italian compositions, and is much too serious to be called a burlesque. Mr. Aymer Vallance, in his article on "Good Furnishing and Decoration," deals this month with "The Boudoir," in which the very first illustration repeats a perpetually recurring mistake in the title "An 'Adams'' Boudoir"; how many times is one to have to remind people that the architect's name was "Adam," and not "Adams"? Considering that a boudoir is essentially a lady's sanctum or "own room," we do not think that any of the examples give the ideal character for such a room; they want grace and elegance; their lines are too square, and the character of room and furniture not sufficiently refined: some of the rooms are too stately for the idea of a boudoir; others too much like cottage rooms. It is all very well to study simplicity of line in furniture, in its proper place; but that is not in a boudoir. As to the detail of a chimney-piece "in the new style," it can only be called atrocious in taste; we are glad to find that it is from a French interior and not from an English one. It forms a sinister comment on the discussion or symposium on *L'Art Nouveau*, which is going on in the same magazine, and in which Mr. Reginald Blomfield hits the nail on the head when he says: "It has no regard to material, treating stone as if it were wood, and wood as if it were lead; and as to its intention, the crazy network

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of its lines makes the sort of appeal that would be made by—a cluster of reptiles." "Perhaps *l'Art Nouveau* may do its work in showing once and for all to what depths it is possible to sink when all touch of tradition is lost. There is only one thing that it certainly is not, and that is art."

The *Burlington Magazine* contains an interesting article by M. Paul Vitry on the exhibition of the French Primitives ("Primitifs" would surely be more correct) which was to be opened this week at Paris, the object of which is to give a kind of general picture of artistic movement under the Valois, from Philip VI. to Henri III. An exceedingly curious altar-frontal from Narbonne, which will form one of the exhibits, is the subject of three illustrations. "Claydon House, Bucks," is the subject of an interesting article, to be continued by Mr. R. S. Clouston. This is more or less an Adam house, and the saloon, with its coffered cove to the ceiling, and its columned doors, is in the best style of Adam's work; we quite agree that the *rococo* marble chimney-piece introduced is a blemish to the room. Details given from other parts of the house are in a far less pure taste than the saloon, and are rampant with florid filagree ornament; the influence and work of Chippendale is suggested by the author to account for these, with considerable probability. An article on a collection of powdered blue Chinese porcelain belonging to Sir William Bennett gives some valuable information on this class of work, accompanied by some excellent illustrations.

The *Berliner Architekturwelt* is largely devoted to the German work for the St. Louis Exhibition. We have a double-page coloured plate of the large hall for German exhibits, in which *l'Art Nouveau* is in full swing. It shows low square columns at the sides, crushed by an enormous sloping roof out of which semi-circular Welsh vaults are scooped in the lower portion. Some of the details, given on another page, are fearful and wonderful. Some of the interiors of rooms, etc., for the Exhibition, are more sober in taste, but not in any other way remarkable. There are illustrations of a terrible design for a warehouse in the Rosentalerstrasse at Berlin, by Herr Messel, happily balanced by Herr Hoffmann's Municipal School of Handicraft in the same city, a building suitably and broadly designed without any eccentricity, and with a graceful tower at the angle. A few pages are devoted to an essay on Berlin architecture of the past year, by Herr A. Brüning, to which we may return.

The *Architectural Record* (New York) devotes an article to "The New Portals of St. Bartholomew's," in Madison-avenue, New York; a work to which we have already called attention in connexion with a more brief notice in *Scribner's Magazine*. The interest in the design consists partly in the fact that it is a modern instance of architectural decoration worked out by an architect acting in conjunction with several sculptors, the whole being thought out and designed so that the architecture should form a suitable frame for the sculpture, and the sculpture should be subordinate to and assist the whole effect of the architecture. That is the way to produce harmonious and effective architectural decorative design; and judging by the photographs, the result is a remarkable success. We have three doorways of Romanesque, or semi-Byzantine, character, with decorative foliage on the archivolts; sculptured subjects in the tympana; bronze doors with sculptured panels in relief; and a frieze of figures on a small scale between the archivolts of the two outer doorways and the central one (which rises higher than the others). There is only one decided fault—this frieze does not connect properly with the archivolts of the outer doors, stopping short of them instead of stopping against them, and thus producing rather the effect of being an after-thought, got into its place anyhow. We may also observe that the frieze, though its general decorative effect is very good, shows in the enlarged view that want of "style" in bas-relief, which is the short-coming, so far, of American sculpture, and on which we have before remarked in connexion with other works of the kind. As a whole, however, this piece of façade decoration is well worth attention. The architects are Messrs. McKim, Mead, and White; the sculptors, Mr. Herbert Adams, Mr. Philip Martiny, Mr. D. C. French, and Mr. Andrew O'Connor. The bronze doors, it may be observed, were completely modelled in clay, and then cast in one piece. It is unfortunate that in order to preserve these doors from injury, and also to have less heavy portals for opening and shutting, it appears (according to Mr. Sturgis, who writes the article), that the bronze doors are nearly always practically covered and out of sight, and that the whole effect of the decorative composition is therefore only to be seen by special arrangement. This is not the way things would have been done in the Renaissance period, when works of high art were produced in objects for daily use; and we think the church should rather make practical use of these doors, and recognise that if they get worn out, other or better ones may be produced. It seems that in modern times we are so astonished at having produced anything good that we are afraid of using it! In an article on the St. Louis Exhibition a great number of the erections are illustrated, which we have not space to comment on just now, the copy of the April issue having only reached us at the last moment.

In *Public Works* Mr. G. Allanson-Winn continues his interesting study (fourth article) on "Sea-coast Erosion," with diagrams of various arrangements of groynes for producing special results. He has arrived at the conclusion, however, that where deep-sea erosion is steadily progressing, beyond the line to which groynes can be constructed, no measures for protection can be considered anything more than merely palliative. His reasons for recommending slanting groynes in many cases in place of groynes placed at right angles to the coast, it would take too much space to go into here, but they are well worth attention. He has shown at least one decided case in which slanting groynes collected a quantity of shingle to defend the base of a cliff. The slanting groynes are at a much flatter gradient than those at right-angles to the coast, "and therefore the retreating water which causes the scour has less power to carry away the deposited shingle." Under some circumstances he thinks that lines of sheet piling parallel to the coast, at successive levels in the slope of the beach, and connected by low groynes, may be very effective in preventing denudation. Among other articles are "The Water Supply of Boston," by Mr. E. S. Sears, with the descriptions and drawings of the works at the Wachusett reservoir; a historical article on "Irrigation," by Mr. R. B. Buckley, and "Roman Drainage Works and Rivers Regulation," by Mr. Thomas Ashby, junr.

To the *Nineteenth Century* Mr. F. Wedmore contributes an article on "The Place of Whistler," which, as might be expected, is a more sane critical judgment than has been shown in most things that have been written about Whistler recently, and is a welcome relief to the series of idolising tirades which have been thrust upon us at every turn. Mr. Wedmore, in our opinion, takes Whistler's lithographs a great deal too seriously; but in general he gives an appreciation of the artist's real gifts and real limitations which may be taken as representing the truth about his art. He remarks on the variety of mediums in art used by Whistler—painting in oil and water colour, pastel, pencil, etching, lithography, and attributes this partly to a strong sense of the appropriate and the fitting in the technique of art, so that he enjoyed illustrating in each form of art its appropriate treatment (and, as Mr. Wedmore truly says, he never made a mistake in this respect); partly to the desire of change. The central principle with Whistler was that an art must be decorative; and, as Mr. Wedmore says, he might have been one of the greatest decorative painters of the world "had he had Tintoret's opulent palette, or the majesty of Veronese's draughtmanship, or the remote, suave dignity of design of Puvis de Chavannes." These Whistler had not; and with all his gifts, he is a much more light-weight artist than his admirers generally recognise.

The *Independent Review* contains a good article by Mr. Laurence Binyon on "Blake." He brings two prevailing elements in Blake's genius in pointing to his love of flames and of the sinuous lines which they produce, and to his passion for the naked form as the great poetic symbolism in the hands of the painter. Blake is an artist whom people either run mad about or regard with dislike and distrust. Mr. Binyon shares neither weakness; he can see Blake's greatness without being blind to his weaknesses; and the article is a very sound and just piece of criticism.

The *Fortnightly Review* contains an article "Of the True Greatness of Thackeray," which may be mentioned here, though not within our class of subjects, inasmuch as it is written by the editor of this journal.

In *Scribner* Mr. Montgomery Schuyler gives a description of "The Architecture of the St. Louis Fair." Why call it a "Fair"? The street people in Paris in 1900 certainly spoke of the exhibition as "*la foire*," but then they were supposed not to know any better. "Exhibition" is not only a more dignified appellation, but more in accordance with facts. The illustrations are amusing in a sense; the architecture seems very good for that kind of occasion, but so absolutely and entirely French in taste and manner that it is difficult to believe that these are not illustrations of the next (or the last) Paris Exhibition. It is a pity the architects concerned did not make an attempt to strike out a treatment of their own.

Harper contains an article on "Life and Diseases of Metals," by Mr. E. Heyn, Professor at the Technical Experiment Station of the Berlin Royal Polytechnic School. It is accompanied by some microscopic sections of copper and steel as influenced by wear or other agencies injurious to their structure.

The *Pall Mall Magazine* has an article on "A French Artist in London," M. Reynouard to wit, of whose slight but admirable sketches of London people and scenes a good many reproductions are given. We commend to special notice that of the girl "Copying at the National Gallery," and the two of "The Conductor" of the Guards' Band. His sketch of "A London Policeman" is not fair; he has (maliciously) selected a figure that is not typical of the Force. M. Reynouard, like most Frenchmen, seems to have found London depressing; but, on the other hand, he avers that no religious edifice in Europe compares in majesty with St. Paul's. Certainly there is no domed church in Paris to equal it, in spite of the Panthéon and the Invalides.

In the *Cornhill* Mr. J. E. Vincent writes a paper, which is as the voice of one crying in the wilderness, on the loss and mischief caused by the Thames floods, and the necessity of something being done. Without being a professed engineer, he hazards the assumption that "an age which has seen the Nile controlled might easily see the Thames reduced to discipline"; in which we cannot but agree with him. But it means a good deal of money, and there is the weight that pulls us down.

The *Antiquary* contains three articles of rather exceptional interest; one on "Neolithic and Other Remains Found Near Harlyn Bay, Cornwall," by Mr. J. P. Arthur; one on the history of the bagpipe, by Mr. J. H. MacMichael; and one on Ansley Church, Herts, by Mr. W. B. Gerish, who describes the church as a "miniature minster, perfect in its people's nave and aisles, its chapels in the transepts, and its ancient choir." The discoveries at Harlyn Bay consist of cists with skeletons, laid in the posture familiar in neolithic interments; an iron implement was found in one of the tombs, as to which there are doubts expressed whether it was not introduced at a later period and during a disturbance of the tomb. There are other theories to account for its presence without presupposing its use as a tool; though these seem to us rather far-fetched. We are inclined, however, on the showing of Mr. Arthur's article, to believe in the neolithic character of these interments.

In the *Century* Miss Edith Wharton has an article on "Villas near Rome," with some effective illustrations, some in colour, some in grey, of the gardens of d'Este, Lante, and one or two others. Perhaps the most remarkable things illustrated, however, are the Reservoir at Villa Falconieri, with its great cypresses mirrored in the calm water, and the garden sculpture at Caprarola. The same number contains a very interesting article on the Siberian railway, by Mr. Davidson, United States Consul at Antung, Manchuria, giving a description of the cars, the arrangements and charges for passengers, but no engineering details; it is an article written from the ordinary travellers' point of view.

BUTE MEMORIAL, ST. ANDREWS UNIVERSITY, GLASGOW.—A memorial bust of the Marquis of Bute, the work of Mr. Pittendreigh Macgillivray, R.S.A., has just been unveiled in the Bute Medical Buildings. The bust is more than life-size, and shows the Marquis in the robes of the Lord Rector of St. Andrews University.

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HOW THE GOVERNMENTS OF EUROPE AND AMERICA PRESERVE THEIR ANCIENT MONUMENTS AND NATURAL SCENERY.*

THE adequate protection of ancient monuments and natural scenery is greatly desired by many of us, for they are now recognised as providing something more than amusement for antiquarians and subjects for landscape painters. It may therefore be of interest to examine briefly the steps taken by the Governments of Europe and America to bring about this result, although it is impossible, within the limits of our article to do more than indicate the general direction taken by legislation with regard to this matter.

We must realise at once that we cannot preserve the realities of antiquity, but memories and isolated examples only, and the same has to be said of the purely natural features of our landscape.

Let us face the fact at once then; the glories of the past have departed for ever. Neither the technical skill nor the literary power of our greatest experts can do more than construct a reminder of them. To see that, we have only to compare the interest aroused by a paper on some ancient building read at a winter meeting of an archæological society with that awakened by a visit to the same building in the course of a summer excursion. Ancient remains which exist have much to teach; it behoves us, therefore, who believe that their lesson is a beneficial one, to insure the continuance of their existence and the consequent prolongation of the lesson. And the same has to be said with regard to much of the natural landscape of this country.

So let us realise at once that in a time of commercial and industrial development, of constantly increasing population, when we are covering whole counties with houses, and when the jerry-built villa is invading our heaths and our pinewoods, when every street in our towns is undergoing improvement, the demands of the utilitarian have a tendency to swamp every other consideration, and the records of past ages, either in the natural features of our landscape or in the building of our ancestors, are swept away and lost for all time. Numberless instances of such destruction will occur to everyone—the primeval fen land is drained, and where the mowing machine comes the swallow-tail butterfly cannot remain; the water from our grandest falls is conducted away in leaden pipes for generating electricity; the triumphs of an age of bridge builders are destroyed that an iron-girder substitute may bear the weight of motor traffic; ancient barrows and stone circles are robbed in order that the flints they contain may be sacrificed to some practical use. The Cheddar cliffs are converted into road material; Wren churches are destroyed that their site may bear a stupendous block of offices; mediæval almshouses are removed that tramways may be made. Much of this is, of course, inevitable, and I at least have no desire to share with Mrs. Partington the labours of stemming the Atlantic tide with a housemaid's mop. But the evil may be reduced to a minimum, and it may, I think, turn out that it is not an ocean's tide which we have to face, but only the flow of a river which may easily be controlled by an efficient system of locks. If our ancient monuments and our natural scenery is to be preserved, it seems to me that in the first place their preservation should be desired by the people at large, and it is for us who appreciate these treasures to cultivate that desire; in the next place the central government should take the lead in effecting the wish of the nation. Let us see how far the Governments of Europe and America are giving the lead required.

Beginning near at hand, we see in France that national monuments of historic or artistic interest are scheduled under the direction of the Minister of Public Instruction and Fine Arts. In cases in which a monument is owned by a private individual, it usually may not be scheduled without the consent of the owner, but if his consent is withheld the State Minister is empowered to purchase compulsorily. No monument so scheduled may be destroyed or subjected to works of restoration, repair, or alteration without the consent of the Minister, nor may new buildings be annexed to it without permission from the same quarter. Generally speaking, the Minister is advised by a commission of historical monuments, consisting of leading officials connected with fine arts, public buildings, and museums. Such a commission has existed since 1837, and very considerable sums of public money have been set apart to enable it to carry on its work. In 1879 a classification of some 2,500 national monuments was made, and this classification has been adopted in the present law. It includes megalithic remains, classical remains, and mediæval, Renaissance, and modern buildings and ruins.

The Belgian people appear to have realised for a very long time the importance of preserving their historic and artistic treasures. By a royal decree of 1824 bodies in charge of church temporalities are reminded that they are managers merely, and while they are urged to undertake in good time the simple repairs that are needed for the preservation of the buildings in their charge, they are strictly forbidden to demolish any ecclesiastical building without authority from the Ministry which deals with the subject of the fine arts. By the same decree they are likewise forbidden to alienate works of art or historical monuments placed in churches. Nine years later, in 1835, in view of the importance of assuring the preservation of all national monuments remarkable for their antiquity, their associations, or their artistic value, another decree was issued constituting a Royal Commission for the purpose of advising as to the repairs required by such monuments. Nearly 200,000 francs are annually voted for expenditure for these purposes. The strict application of these precautionary measures has allowed a number of monuments of the highest interest in their relation to art and archæology to be protected and defended, but it does not appear that the Government controls in any way those monuments which ar in the hands of private persons.

In Holland no statutory provisions exist for this end, but public money to the extent of some five or six thousand pounds a year is spent on preserving and maintaining national monuments and buildings of antiquarian and architectural interest.

Germany likewise lacks statutory provisions with regard to ancient monuments generally, but there would appear to be a growing feeling that steps ought to be taken to protect both them and the natural beauty of the landscapes of the country. Prussia and Hesse are taking steps to control and limit the disfigurement of landscapes by advertisement hoardings; for it is realised that the interest of all who love beautiful nature is in question, and, moreover, that it would be folly to overlook the pecuniary loss which must accrue if the natural beauty is damaged which attracts the tourist. In Saxony a Commission for the Preservation of Monuments has recently been appointed for the supervision of their removal, restoration, or repair; and although no right of active protection of monuments possessed by private persons is conferred upon the Commission, I understand that in desirable cases it would be ready to address an official protest to any individual proprietor and to expose him to official pressure and remonstrance in the necessary direction. In Bavaria precautions are taken to protect public buildings which are to undergo repair, but action on the part of the State does not go beyond that point. Plans for any important alterations of a national building, either secular or ecclesiastical, have to be submitted to the Royal Commissioners of Public Buildings and approved by them. A passage from the ministerial order of 1884 with reference to the restoration of churches may be justly quoted:—

"If the restoration of a public building is to be completely successful, it is absolutely essential that the person who directs it should combine with an enlightened æsthetic sense an artistic capacity in a high degree, and, moreover, be deeply imbued with feelings of veneration for all that has come down to us from ancient times. If a restoration is carried out without any real comprehension of the laws of architecture, the result can only be a production of common and dreary artificiality, recognisable perhaps as belonging to one of the architectural styles, but wanting the stamp of true art, and, therefore, incapable of awakening the enthusiasm of the spectator."

And again:—"In consequence of the removal or disfigurement of monuments which have been erected during the course of centuries—monuments which served, as it were, as documents of the historical development of past periods of culture, which have, moreover, a double interest and value if left undisturbed on the spot where they were originally erected—the sympathy of congregations with the history of their church is diminished, and, a still more lamentable consequence, a number of objects of priceless artistic value destroyed or squandered, whereby the property of the church suffers a serious loss." How much richer might we be here in England if only our central authorities had in the past circulated these admirable doctrines!

If we turn to Denmark we find that, as in the case of Belgium, the preservation of immovable objects of historical value has attracted the attention of the Government from the early years of the XIXth century. As early as 1807 a Royal Commission was appointed, whose powers have from time to time been increased. It has no direct control over those monuments which are not the property of the State, but when any particular monument is inadequately protected it has powers of acquisition by purchase. The Government has taken steps to impress upon owners the importance of preserving ancient monuments and upon the incumbents of livings the desirability of protecting the ecclesiastical remains of which they have charge. Steps have also been taken by the Government to prevent removals of stones from monuments of historic interest for utilitarian purposes, such as is causing the rapid disappearance of the remains on Dartmoor in this country. Outside the scope of the Forest Laws, which prevent undue destruction of trees, the Danish Government has not taken any special measures to protect natural scenery as such.

The Government of Sweden and Norway has advanced so far as to have laid down the principle that an ancient monument (the term including long abandoned burghs, castles, monasteries, etc.) may be of such an age that it can no longer be held to be private property. The State Antiquary, acting on behalf of the Royal Archæological Academy, may cause to be raised or repaired fallen stones, notifying his intention to the owner or occupier of the land on which they are situated, and, if necessary, compensating him for damage. The site of such remains may not be cultivated to any increased extent without special permission. Fines are imposed upon anyone who may demolish or disturb ancient relics by blasting or ploughing. Old churches, to which historical memories cling or which possess features of artistic interest, may not be destroyed without the Royal permission.

The Government of the Tsar has not yet turned its attention to this subject, but from a recent announcement one may perhaps conclude that public opinion, in the capital at any rate, is moving in the right direction, for it appears that the City Council of St. Petersburg proposes in future to exempt from taxes those persons who build artistic houses, to confer gold medals on the architects, and to insert a marble tablet on the best façades. The demands of beauty therefore, as well as of utility, are to be encouraged.

In Austria there has existed for the past forty years an "Imperial and Royal Central Commission for the Investigation and Preservation of Artistic and Historical Monuments," constituted for the purposes of inspection and consultation, and in order to quicken the public interest in these matters. It is a central body, in close touch with the Government, and working throughout the country by means of local correspondents or "conservators." It has rights only over those buildings which belong to the State, and has no rights whatever over private property; but nevertheless its advice is often sought and plans for restoration, etc., submitted to it for correction, and its existence forms an official acknowledgment of the desirability of placing ancient monuments beyond risk of destruction.

The Greeks have stringent regulations to insure the preservation of antiquities, which are regarded as national property, and may on no account be damaged either by owner or lessee. To remove all temptation for the filching of stones it is forbidden to construct a lime-kiln nearer than two miles from any ancient ruins. Should an owner in any particular case refuse to co-operate with the Government in repairs to an ancient monument his interest in it may be compulsorily purchased.

It is said, however, that, while the greatest care is taken of classical remains, the law is not so strictly enforced as might be with regard to mediæval monuments.

In Italy the laws on this subject vary in the different portions of the kingdom, but the most

* A paper read by Mr. Nigel Bond, Secretary of the National Trust, at a meeting of the Dorset Natural History and Antiquarian Field Club.

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important law is that founded on the edict of Cardinal Pacca of 1820. Among the regulations contained in it is one forbidding the owners of estates on which ancient monuments exist to do them damage or to make use of them for any common or unworthy purposes. Road mending would appear to be in all countries a baneful source of woe to the antiquarian, and it may be some consolation to us to know that even in Italy it is necessary to take precautions to protect ancient monuments from the highway authorities.

The Swiss Federal Council has appointed a Commission to look after the historic treasures in that country, and makes an annual grant for the purpose, part of which is spent in aiding private individuals in their preservation and another part in their purchase by the State.

Spain has elaborate machinery for the protection of historic and artistic monuments. Each province has a commission immediately dependent on the Royal Academies of History and Fine Arts in Madrid. These commissions give official recognition to the antiquarian or artistic value of public monuments, direct archæological investigations, and prepare catalogues of buildings of interest. Public local bodies have to keep them informed of the condition of classified buildings and of proceedings affecting them. The commissions do not appear to have any absolute power to prevent injury to monuments in private hands, but from their official character and position exercise considerable weight on their behalf.

When we leave Europe, and turn our eyes across the Atlantic to the New World, we have in front of us, of course, a land of natural beauty rather than of historic association; but it is worth while to note that the Americans have in many cases taken steps to secure the preservation in their original condition of the scenes of historic battles, partly as national monuments, partly for purposes of military education. New York State owns Washington's headquarters at Newburgh, and has also acquired the Saratoga monument (originally erected by private subscription) and the lands surrounding it. In many of the States (notably in Florida and North Carolina) the sites of ancient burying-places are carefully protected. With regard to prehistoric remains also, in Ohio, which is one of the richest fields in the world for archæological work, the State partially maintains an Archæological and Historical Society, the purpose of which is to preserve historical material and to afford better care and protection for tumuli and other relics.

The great national parks are, of course, one of the chief features of the country. These are not confined to the neighbourhood of great cities, and in them the natural features of the landscape are placed beyond all possibility of destruction. The best known of these is the Yellowstone Park, whose size exceeds thrice that of the county of Dorset. Twenty years have now elapsed since this great area was set aside as a public recreation ground and as a place of security for all kinds of animal and vegetable life.

Lack of time prevents my making more than a passing allusion to the remarkable work of the Massachusetts reservations. The City of Boston has organised an almost perfect system of open spaces of all kinds, in order that the citizens may enjoy the benefits of natural scenes in the midst of what would otherwise be a vast area of unadulterated bricks and mortar. Over 7,000 acres have been acquired for public parks within the metropolitan area in the last ten years, and these parks are connected with one another by park ways or green lanes, of which there are some twenty-three miles in all, and in addition to this large areas along the river banks are preserved as public open spaces.

Finally, as to Niagara. New York State acquired in 1883, by compulsory purchase, the American portion of the Falls, together with Goat Island and a fringe of the shore in order to effect the preservation of the scenery; and the Canadian Government has, if somewhat more reluctantly, taken similar precautions with regard to the opposite bank and side. It may be mentioned that the movement with regard to Niagara was the outcome of efforts made by the late Lord Dufferin when Governor-General of Canada.

I have now told my tale, though, I fear, without adornment; may I, in conclusion, briefly point to a moral? Our Protectionist friends have not yet subjected the importation of foreign example in legislation to any prohibitive tariff; we are still free to consider whether we could not in some degree follow the direction in which the foreigner has led. Here in England we did not begin to protect ancient monuments by law till 1882, and even then we cautiously experimented upon megalithic remains only. Three years ago the somewhat limited powers of the Commissioners of Works were (by an Act promoted by the National Trust and drafted by its chairman) extended to county councils, and the term "monument" was interpreted to mean "any structure, erection, or monument of historic or architectural interest or any remains thereof." But the State is in the United Kingdom utterly powerless against the owner of even our most important monuments. The powerlessness of the Government has been well exemplified during the last year or two in the face of the determined effort of inexpert enthusiasts to find the Ark of the Covenant among the remains on the Hill of Tara.

I am not one of those who think that we should be the better, either politically or morally, for allowing the State to do the work of the individual. I would infinitely rather see the preservation of places of historic interest or natural beauty carried out by some such association of private individuals as the National Trust; nor do I think that a study of the laws of other countries forces one to the conclusion that excessive State interference is necessary. But I do think that our Government should give greater encouragement to those who have undertaken this work, that it should head the movement in a more determined way than it does at present. It ought to guide and educate public opinion in these matters without, of course, being far in advance of the thoughts and wishes of the people. It seems to me somewhat humiliating that in this year of grace it should be found necessary to form a National Art Collection Fund of voluntary subscriptions because the citizens of the richest country in the world are not willing to provide out of public money sufficient adequately to supply additional art treasures to our National galleries and museums.

Still we need not be without hope. Our Government has recently acquired, and is now taking steps to give proper protection to, the ruins of Tintern Abbey; a clause was inserted in the Irish Land Bill last year with the intention of further protecting the monuments which would probably receive but scant respect at the hands of peasant proprietors. There are, in fact, signs of a change at hand. But we shall do well to remember that our neighbours (in many cases much poorer than us in both relics of the past and the beauties of nature) are much more inclined to give official recognition to the importance of all artistic and historic questions. If we do so, and if we are thereby spurred to greater voluntary effort, our examination of their laws, however inexhaustive, will not have been entirely fruitless.

OSBORNE HOUSE, ISLE OF WIGHT.

THE rearrangement of Osborne House, which was opened on April 6 as the Osborne Convalescent Home, for naval and military officers, has been carried out under the superintendence of Sir Schomberg McDonnell, Secretary, and Mr. Rowland Bailey, Comptroller of Stores, H.M. Office of Works. The entrance-hall and stairway, the Durbar Hall (designed by an Indian architect, Ram Sing), and Queen Victoria's private apartments remain as heretofore; the Victoria Hall (formerly the chapel) is converted into a library for the patients; the visitors' rooms are assigned to the matron and nursing staff; and other apartments have been fitted up for about forty-five resident patients. The late Queen bought the property (376 acres) from Lady Isabella Blackford, together with the adjoining Barton estate (817 acres), five years after her marriage. A subsequent purchase by her of other land increased the property to about 1,800 acres, extending from East Cowes to King's Key. A part of the XVIth century Barton Court house was pulled down, and the rest was restored for the bailiff's residence. Barton Manor, which had belonged since Henry VI.'s day to St. Mary's College, Winchester, was sold by the latter to Queen Victoria. To the former Osborne House was added an outlying wing, on the west side, in 1845-6, Thomas Cubitt being appointed as architect to the Queen and the Prince Consort for the whole work. The wing, 65 ft. square on plan, contained the drawing-room extending along the entire sea-front and divided from the billiard-room by a screen of columns, the dining and other rooms; a lofty campanile, 20 ft. square at base, and having a round teak staircase leading up to the observatory, projects from that front. The floors were constructed of iron girders and brick arches, the chimneys were brought together at the centre, and the flat roof consisted of double brick arches with an intervening space. After a year or so the old house gave place to a block designed to harmonise with the west wing, in the Italian style, faced with cement, and having a rusticated ground-story and a large cornice with consoles. A clock-tower stands at the east end, and the two blocks are connected by a corridor that is continued along all the south side of the later building. The gardens on the water-side, which fall to a vertical depth of some 150 ft., were then laid out with terraces having balustrades and flights of steps. A view and ground-plan of the additions and alterations made by Cubitt are given in our columns of November 25, 1848.

THE ROYAL HORTICULTURAL SOCIETY: 1804–1904.

ON March 7, 1804, the Royal Horticultural Society was founded by the joint efforts of Sir Joseph Banks, R. A. Salisbury, and T. E. Knight, and received a charter of incorporation in 1809. In the course of next July will be completed the new centenary horticultural hall and offices erected in Vincent-square, Westminster, from plans and designs by Mr. E. J. Stubbs. In August last year Sir Thomas Hanbury bought for presentation to the Society the estate and garden, extending over 60 acres, at Wisley, near Woking, of the late G. F. Wilson, F.R.S. In 1821 the Society took a lease, of which sixteen years are still unexpired, at a rent of 300*l.* per annum, of about 33 acres at Chiswick, being part of the market-gardeners' grounds appertaining to Chiswick House, the Duke of Devonshire's seat, and removed thither from their gardens at Kensington (near the Addison-road station) and Ealing. The buildings at Chiswick were designed by William Atkinson and by W. Hurst Ashpitel in 1822-3, and there Sir Joseph Paxton worked as a groundgardener for a wage of 12s. per week. The Society now occupy only 11 acres at Chiswick, whilst the gradual closing-in of the gardens renders them no longer suitable for their purpose, and the once highly-fashionable *fêtes* have long been discontinued.

The plot of 20 acres of the Gore House and adjoining estates at South Kensington, which the Society rented upon a thirty-one years' lease in 1859 from the Commissioners for the Exhibition of 1851, were laid out, in readiness for the International Exhibition of 1862 (Natural History Museum site), by Sir Henry Cole, R. Redgrave, and Captain Fowke, R.E.; Mr. Nesfield planted the gardens, which were diversified with terraces and slopes to meet the inclination of the ground. In the middle was erected Durham's memorial statue of the Prince Consort, who was elected president of the Society in 1858, and until his death in 1861 did much to retrieve their somewhat untoward fortunes. On July 9, 1859, and December 29, 1860, we published illustrations of the two quadrantal side-arcades which were turned to meet the large conservatory at the north end of the grounds, as designed by Sydney Smirke. After an unsuccessful law-suit between the debenture-holders and the Commissioners the latter felt themselves constrained to exercise their rights of re-entry, and in the result the gardens were gradually altered and encroached upon by the building of pavilions and galleries for the series of annual Exhibitions held in 1871-4, and they were further curtailed for the Fisheries and other Exhibitions of 1883-6. The materials and effects were eventually disposed of in 1887-9, and the site is now traversed by Imperial Institute-road and otherwise covered by blocks of flats, the Royal College of Music, Royal School of Art Needlework, Royal College of Science, and the Imperial Institute and University of London buildings. Five years ago the Society, to which nearly 200 local societies are affiliated, obtained a third charter; they have expended upwards of half a million of money in fostering and encouraging every branch of horticulture, and in the collection both abroad and at home of information and specimens relating to the cultivation and rearing of all kinds of plants and trees whether for useful or ornamental purposes.

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LOCOMOTIVE BY-LAWS FOR THE COUNTY OF LONDON.

THE by-laws submitted last month to the London County Council by the Public Control Committee for the regulation of locomotive traffic on highways are very similar to those made by the Council in 1899, but with the addition of by-laws prohibiting or restricting the use of locomotives on certain specified highways and bridges, and requiring a person in charge of a locomotive to give his name and address on demand to a police constable or any authorised official of the Council.

Before definitely agreeing upon their recommendations the Public Control Committee entered into communication with the metropolitan borough councils. Some of these bodies do not view with favour the proposal to limit the use of locomotives in their districts, but several of them find just cause of complaint against traction engines, and many residents in various localities have experienced annoyance and in some cases damage to their premises, from the passage of heavy road engines. Information has also been received by the Committee from the owners of canal and other bridges as to the amount of the loads to which such structures may safely be subjected.

As a result of their deliberations the Committee have come to the conclusion that it is necessary for the Council to exercise the powers of prohibition and restriction conferred by the Locomotive Act of 1898. It may, perhaps, be thought somewhat hard that those who have adopted an improved form of traction should be subjected to regulations from which the owners of heavy horse-drawn vehicles are totally exempt, but the great weight of road locomotives, and the fact that such engines are often used to draw trains of wagons through the streets, are reasons why proper regulations should be formulated. In a cartoon map and five schedules, prepared by the Public Control Committee, are indicated the streets and roads which it is proposed shall be open to this class of traffic. On some highways the use of locomotives is to be restricted to the hours between 9 p.m. and 8 a.m., on account of the crowded state of the roadways; on other highways in residential districts their use will be restricted to the hours between 7 a.m. and 10 p.m., to protect residents from annoyance and inconvenience. In order to provide facilities for through traffic, however, certain highways are to be placed freely at the disposal of road locomotives at all hours of the day and night. A list of some twenty-three bridges is given which will be entirely closed to locomotive traffic, and a second list of some twenty-eight bridges on which the weight of locomotives must be strictly limited to specified amounts. It should be noted that locomotives are to be excluded from all streets and roads not coloured on the map and not indicated by the schedules, but nearly 500 highways will even then be more or less open to such engines, which, it must be admitted, are not particularly suitable for employment in the crowded streets of cities or even in busy suburban roads. So far as we are able to judge after careful examination, the schedules appear to have been drawn with considerable care, and with adequate knowledge of local traffic conditions; and a satisfactory feature presented by them is that the through routes, on which it is proposed to allow the use of locomotives in the County of London outside the city, have been arranged so as to conform with the routes through the city which are available for locomotives between the hours of 7 p.m. and 9 a.m., under the by-laws of the City Corporation.

The by-laws to which we refer will not, of course, apply to motor vehicles, except such as are locomotives within the meaning of the Act.

IMPROVED STREET LIGHTING IN EDINBURGH.—At a meeting of a Sub-Committee of the Cleaning and Lighting Committee of Edinburgh Town Council on the 30th ult., two proposals were under consideration for the improved lighting of the city on those thoroughfares which are not at present lighted by electricity. One motion was that the whole of the streets should be lit by electricity, but the Committee considered that such a scheme was at present unworkable, and that the lighting proposed under it would be quite inadequate. After hearing a report by the Inspector of Lighting, the Committee resolved to recommend, on the lines of a motion by Bailie Mallinson, that within the next five years the ordinary gas lamps of the city should be converted into incandescent light, with square lanterns instead of the present globes.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION:

ORNAMENTAL LEADWORK.

THE tenth meeting of the session was held on the 30th ult. at the new premises of the Association in Tufton-street, Westminster, when Mr. G. P. Bankart introduced the subject of "Ornamental Leadwork" for discussion.

After a lament as to the alleged neglect of the material and a plea for its more general use artistically, the author pointed out that it was capable of being cast, cut, modelled by hammering and beating, engraved, jewelled, inlaid, soldered into patterns with bright tin, modelled, coloured, and gilded. In France and Germany in the Middle Ages it was mostly beaten into shape, coloured and gilt, engraved or painted. England, being the chief lead-producing country, used it more extensively than either France or Germany; but most of the English, unlike the continental work, was cast, with modelled enrichment. They economised solder everywhere, fixing everything in small loose pieces with hooks and loops, with the object of renewing damaged portions without injury to surrounding parts. Towards the end of the XVth century, in France, ornaments made of beaten lead were replaced by decorations cast in stone or plaster moulds. Good work was done in the XVIth century, although the means of fixing and jointing were less studied than in the preceding centuries—the decadence of the art taking place conspicuously in the lapse of the following century. It was observed that change of style in England is shown more clearly in the rain-water heads perhaps than in any other form of leadwork. Lead gargoyles became the favourite playthings, and one at Hardwicke Hall, to wit, was fashioned after the manner of the slit puff of the sleeve of the period. Trough gargoyles were wrought in the semblance of birds' heads and other forms. Rain-water heads—from the simple box form to the combination of the box gutter and outlet all in one—were shown by drawings, and the evolution and developments described. A description of the process of casting lead, patterned and otherwise, in which anything to hand, from a nail head or a piece of wire to patterns made of strips of lead nailed to boards and impressed in the sand mould and afterwards bent or hammered into shape and solder jointed, was next given. All modelled ornament intended for casting in a soft material such as lead should partake of the character of the material, chiefly lying low and away from too ready injury, and not partaking of the nature of carving, although some of the old low relief work was undoubtedly done by pressing carved work into the sand beds. For very slight line and bead work gesso was suitable. Colouring and gilt were largely used. Dutch metal was sometimes substituted for gilt, treated with a preparation of varnish or turpentine and oil to receive the gold, and dressed with parchment size for durability. Another process of decorating lead was by incising the pattern and filling the incised lines with black or coloured wax or mastic.

The discussion which followed the reading of the paper was opened by Mr. M. G. Pechell, and continued by Messrs. T. Fyfe, F. Lishman, L. Ambler, and Mr. L. Weaver, the Special Visitor.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of the Edinburgh Architectural Association on the 30th ult., Mr. A. Hunter Crawford, the President, in the chair, Mr. Thomas Ross, F.S.A. Scot., read a paper on "The Remains and Evidences of Roman Architecture in Scotland." Mr. Ross stated that many evidences still remained of great architectural and engineering works carried out in this country in the first and second centuries, and, although no actual Roman remains now existed in anything like a complete state, still from the numerous plans of Roman buildings revealed by the excavations of the Antiquarian Society of Scotland during the last ten or twelve years, and from the many fragments of details found in these, and in the camp at Barhill, recently searched with so much success, it was now possible to obtain a fair idea of what a Roman station in this country was like, lying four square, with rounded corners, and a gate on the north, south, east, and west, with streets leading from these inward. The buildings within the eight or ten camps excavated were found to be arranged on a definite principle, and before these camps were reached there was no reliable knowledge whatever on this subject. Although no two camps were exactly alike in size, in strength of defence, and in arrangement of buildings, the modifications were seen to be only such as were dictated by local requirements. These modifications were of the same kind and for the same reason as were those found in the arrangements of the cathedrals and abbeys of the middle ages, where, notwithstanding much variety, there was a normal plan. Having described the character of the buildings, Mr. Ross observed that the architectural details found in the ruins had a remarkable likeness to the details of twelfth century buildings, so much so that, were they not beyond suspicion, it would scarcely be credited that they belonged to some time before the third century.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual report of this Association shows that fifteen new members, eighteen associates, and eighteen students have been elected during the past year, and the numbers are now: Members, sixty-nine; associates, seventy-two; students, seventy-eight; making a total membership of 219, as against 203 in the previous year. A considerable portion of the report is occupied with the liberal gift made to the Association by its past President, Mr. W. Glover, and the arrangements and trust deed under which the expenditure of the money is to be regulated.

MODERN PAINTS.

ONE of the results of the rapid progress and expansion of the chemical and allied industries during recent decades has been that a great increase has occurred in the number of cheap pigments and oils placed at the disposal of the paint manufacturer. The invention of machinery capable of effecting fine and uniform grinding and mixing has undoubtedly resulted in a great improvement in the physical condition of commercial paints, for a paint which when dry exhibits a "gritty" surface is of little value, even though manufactured with materials of the best composition. It is, however, doubtful whether any improvement has been effected during the last half century in the composition of paints generally. Linseed oil, turps, white lead, red lead, red iron oxide, and the ochres, which were so largely used fifty years ago and at a much earlier period still form the basis of the best and most durable paints.

Progress appears to have been made in the art of adulteration and in the manufacture of inferior paints at low prices rather than in the discovery of superior or more durable paints. It is, perhaps, true that such crude adulteration as the use of brick dust or clay is less common than formerly, but, even though adulteration has been raised to the level of a systematic science, it is doubtful whether either the paint user, who buys "genuine" paints at impossible prices, or the manufacturer who sells them, is any the richer for trading with a cheap inferior article in place of one of better quality at a higher price.

Unfortunately buyers who pay on a higher scale with the object of obtaining an unadulterated article often receive precisely the same paint as the purchaser who pays a lower price, for deception is in many cases facilitated by the fact that the buyer omits to apply even the simplest tests to ascertain whether he has received the material for which he has paid. Linseed oil is adulterated with rosin oil or mineral oil, turps with petroleum spirit, and pigments with barytes, chalk, or gypsum; and this adulteration is now so general that it is often difficult to obtain an unadulterated article even though prepared to pay a good price. White lead, for example, for which a high price is paid, is often as heavily adulterated with barytes as that sold at a lower price.

A recent application to six well-known firms for quotations and samples of pure oxide of iron paint, special emphasis being laid upon the necessity for purity of the iron oxide, resulted in the discovery that in only one instance did the pigment approach to commercially pure oxide of iron. In some of the samples barytes was present, and in one case resin and naphtha had also been used. One of the samples contained 50 per cent. of barytes and only 24 per cent. of iron oxide, and the pigment was in such a granular condition that when the paint was spread over a smooth surface and allowed to dry, the surface of the paint was so roughened by the siliceous particles that it was readily

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injured by rubbing it with the fingers. In another case a burnt ochre had apparently been used, and although the paint contained 27 per cent. of siliceous matter and only 34 per cent. of iron oxide it could not be said to be adulterated because it was described as "natural" oxide paint, and many natural iron earths contain an even larger proportion of siliceous impurity.

In some cases an adulterated paint may be as good a paint as the unadulterated article, and some manufacturers consider that fact to be sufficient justification for representing the cheap imitation to be the genuine article. Indeed, some authorities contend that the addition of barytes, one of the cheapest of adulterants, to certain paints improves their quality, and that such addition is not, therefore, adulteration. If the proportion of barytes present in the paint were declared when the paint was sold, the addition of this substance in moderate proportion would not, in some cases, be objectionable; but in the writer's experience such declaration is never made.

The chief characteristics of a good paint are that it is sufficiently liquid to be readily applied by brush or sprayer, that it will dry in a reasonably short time and remain firmly attached to the surface painted, that the dried surface of the paint is smooth, impervious, and sufficiently elastic to enable it to withstand ordinary wear and tear without chipping off in flakes. If the linseed oil be adulterated with rosin oil, or other non-drying oil, the drying may be retarded; or the paint may altogether refuse to dry. If the paint be adulterated with rosin or rosin oil it may appear at first to dry satisfactorily, but may subsequently become "tacky" and form a trap for dust. If adulterated with rosin the surface of the dried paint may be so brittle that it is easily scored by attrition.

The oil is the most important constituent of a paint, but the pigment is not merely an inert material possessing decorative value only. In the case of white lead and red lead a chemical reaction takes place between the pigment and the linseed oil, linoleate of lead being formed. Barytes does not enter into chemical reaction with linseed oil, and it is sometimes urged that barytes is, therefore, a better pigment than white lead or red lead, but the lead paints nevertheless still remain in greatest favour with the majority of experienced engineers and builders. There is, however, a great divergence of opinion as to what mixtures produce the best paints, and whilst accepted authorities disagree it is not possible to determine the protective value of a paint by chemical analysis, but it is possible to ascertain whether a specific pigment has been adulterated with some other material of lower market value, or whether the linseed oil has been largely adulterated with rosin oil or mineral oil. It is extremely difficult, and sometimes impossible, to analyse quantitively a ready-made paint, and the analysis can only be performed by an experienced analyst; but the following simple tests which may be made by anyone of ordinary intelligence, will often suffice to reveal the presence of an adulterant.

SIMPLE TESTS.

Drying Power.—Spread paint in thin layer on strip of sheet glass or metal. If the paint does not dry within forty-eight hours it probably contains a non-drying oil. The chief non-drying oils used as adulterants are rosin oil, mineral oils, and fish oils, and any one of these may usually be detected by its odour. Paints adulterated with rosin are liable to crack after a time, and sometimes a paint so adulterated will, after becoming dry, again become tacky. The presence of an excessive proportion of "dryers" is said to sometimes have the same effect.

Odour.—Rub a few drops of the paint between the hands. Rosin oil, fish oil, or mineral oil may be detected by its distinctive odour. If the paint has been thinned with petroleum spirit instead of with turps this may also be detected by its odour.

Ignition.—In a small porcelain crucible place about six drops of the paint. Warm gently by means of gas or spirit flame, and observe odour emitted. Then increase temperature until the oil and spirit ignites, and continue heat until nothing remains but an incombustible ash consisting of the mineral pigment used in the paint. Note colour of the ash.

Examination of Pigment.—When the ash obtained from the foregoing ignition is cold, transfer it to a glass beaker and boil it with an excess of nitric acid. The acid may be strong at first and be subsequently diluted with distilled water. If the pigment was white lead, zinc white, or iron oxide, it will dissolve almost completely in the hot acid, but barytes would remain as an insoluble white powder. Iron oxide would impart a yellow colour to the acid solution. For a detailed scheme for the examination of the principal pigments and the common adulterants see the "Student's Column" of *The Builder*, December 27, 1902.

ADULTERANTS.

The following are the principal adulterants:—

In Turps.—Petroleum spirit, rosin spirit, shale naphtha, coal-tar naphtha.

In Linseed Oil.—Rosin oil, mineral oils, fish oils, cotton-seed oil.

In White Lead.—Barytes (*i.e.*, barium sulphate), chalk or whiting, gypsum, (sulphate of lime), china clay.

In Red Lead.—Barytes, red brick-dust, iron oxide.

In Zinc White.—Barytes, china clay, chalk, gypsum.

In Red Iron Oxide.—Barytes, burnt ochre.

In Vermilion.—Red lead, iron oxide, red lakes.

THE NEW RIVER COMPANY'S OFFICES, CLERKENWELL.

WE read that the Metropolitan Water Board have agreed to acquire, for 9,500*l.*, a portion of the offices in Rosebery-avenue of the New River Company, and that 2,000*l.* of that amount is to be paid in respect of the "Oak Room," which is used for the meetings of the proprietors. On October 6, 1888, we published a view, reproduced from the beautiful little water-colour drawing by Mr. John Crowther and exhibited in that year in the Royal Academy, of the interior of that apartment, which is fitted with carved work, in the classic manner, attributed to Grinling Gibbons. The compartments of the highly-enriched ceiling with plaster decorations contain a painted portrait of King William III. and the coat-arms of Myddelton and of Grene. The richly-carved overmantel, flanked with Corinthian columns, carries William III.'s royal arms with his motto—"Je Maintiendray." The Court Room is on the first floor of the house, built at the New River Head in 1613, and repaired and refronted in 1782 by Robert Mylne, architect and surveyor to the Company. The house was, it is believed, at one time inhabited by Sir Hugh Myddelton, and during a long period formed the residence of the Company's chief officer. The Court Room was embellished as we now see it (*temp.* William III.) by the clerk to the Company, John Grene, who had married Elizabeth, daughter of Sir William, son and heir of Sir Hugh, Myddelton. The decorated ceiling of an adjoining room, which was ornamented by Grene at the same time, bears the date "1693." Of the old house—having two stories, a high roof with attic, and a range of four columns on the ground floor—there is a good view by Antonio Canale, 1753, engraved by Stevens. T. H. Shepherd's water-colour drawings in the Crace Collection depict the original building, and the new house as in 1852. In the "Oak Room" hangs a large print of the buildings as in 1720, showing the old offices, the basin, pond, and waterworks. The offices in Dorset-street, Whitefriars, which, with voluminous records, were burned on November 24, 1769, were rebuilt by Mylne, whose son and successor, R. Chadwell Mylne, designed and built the engine-house and new machinery at New River Head—retaining, however, as we are informed, the base of the "wheel-house"—and at the subsidence-beds and reservoirs in Stoke Newington.

PROPOSED FIRE STATION, ETON.—On the 23rd ult. a public inquiry was held at Baldwin's Bridge, Eton, by Mr. W. O. Meade King, C.E., Inspector to the Local Government Board, into an application by the Urban District Council to borrow the sum of 5,000*l.* for the purpose of acquiring premises in High-street for a new fire station and surveyor's yard. Mr. C. W. Baker, architect, explained to the inspector the designs, plans, and sections he had drawn for the proposed station. Accommodation would be provided for steam and manual engines, cell-room for alarm apparatus, and a hose-drying tower. On the upper floor would be a meeting room for the brigade, with offices, and living quarters for the resident engineer. Mr. Simmonds, Surveyor of the Council, then gave evidence as to the area of the site, and, after further discussion, the inquiry closed.

RECENT ADDITIONS TO THE VICTORIA AND ALBERT MUSEUM.

THE English earthenware from the Jermyn-street Collection has now been classified and arranged. Among the later additions to the pottery section of the museum is a drug-vase, made by Masseot Abaquesne, of Rouen, in the XVIth century; and a rare porcelain bowl with decoration in the style of Rhodian earthenware, made at Florence or Pisa, and dated 1638. The collection of pewter has been enriched by some new gifts and loans. In the water-colour galleries will be found three bronze statuettes by Mr. Alfred Gilbert; the well-known "Perseus Arming"; a figure called "Comedy and Tragedy," representing an actor holding a mask; and a statuette entitled "An Offering to Hymen," a young girl holding in her hands a winged figure and a stem of flowers. In the same gallery is a replica of Rodin's marble figure in the Luxembourg, Paris, "La Danaïde." At the end of the Prince Consort gallery, near the collection of illuminated manuscripts recently given by Mr. George Reid, cases of manuscripts are now shown for a short time. Prominent among these are a fragment of a Northern French Book of Hours, of the end of the first half of the XVth century; and a German manuscript of the XVIth century, with exquisitely-painted flowers, butterflies, etc., and two naturalistic landscapes.

In the furniture section are two carved wood coffers of Tyrolese and South German work, dating from about 1500, of a style scarcely represented hitherto in the museum collection: also an oak bed-front from the North of Europe, probably XVIIth century work.

Amongst the vestments exhibited in the East Cloisters of the North Court will be found two dalmatics and a chasuble of the later years of the XVth century, said to have come from the Church of St. Severin, at Cologne; they are of stamped woollen velvet, with embroidered orphreys. In an adjoining case is a mauve coloured velvet cope, decorated with appliqué work and embroidery; on the hood is represented the Virgin and Child, whilst Our Lord in glory appears in the middle of the orphrey, with St. Peter, St. Bartholomew, and St. Ursula to the right, and St. Paul, St. John the Evangelist, and St. Andrew to the left beneath canopies. This splendid example of ecclesiastical embroidery is German work of the early XVIth century. At the end of the South Court, in a case facing the lace collection, is hung an altar-frontal in three panels, which is a characteristic piece of Flemish pillow-lace of the XVIIth century, with bold scrolling patterns united by brides picotées. The smaller articles of costume, which are grouped in a large case at the foot of the Art Library staircase, have been enriched by an embroidered silk bodice with slashed sleeves, probably made in Italy during the early years of the XVIIth century.

Some Tudor tapestry hangings, which for many years were on the walls of the audit-room of Winchester College, have been lent by the Warden and Fellows of the College and are exhibited in the Tapestry Court, where they will remain for a few days longer. Two of these hangings form part of a tapestry of great beauty, and are unusual in design. The field is in broad, vertical stripes of red and blue covered with a pattern, over which are the following devices repeated:—The Sacred Monogram, red and white roses, and shields azure, three crowns or. Two other examples form portions of a large tapestry which had for its subject the story of David and Abigail. The tapestry is a Flemish production of the second half of the XVth century. Another tapestry, less important in its character, has the advantage of being complete. It represents a group of figures, enclosed by a border of fruit and flowers. It was most probably woven at Brussels soon after the middle of the XVIth century.

In the Indian section of the museum is an interesting collection of personal ornaments worn by native women, chiefly bracelets, armlets, anklets, and toe-rings, in white metal and brass; for the most part they were found in Central India and the North-West Provinces. They are the gift of Miss E. M. Herbert Wright.

THE QUANTITY SURVEYORS' ASSOCIATION.—The Council of this Association met on Monday, March 28, to consider the application forms which had been forwarded to the Hon. Secretary from gentlemen desirous of being elected to membership. The by-laws of the Association insist on stringent inquiry being made by the Council of intending members, as to training and practice qualifications under Clause 5 of the Articles of Association. It was resolved by the Council that out of 133 applicants considered, 81 be voted as eligible, 32 be referred for further particulars of training etc., and 20 be rejected.

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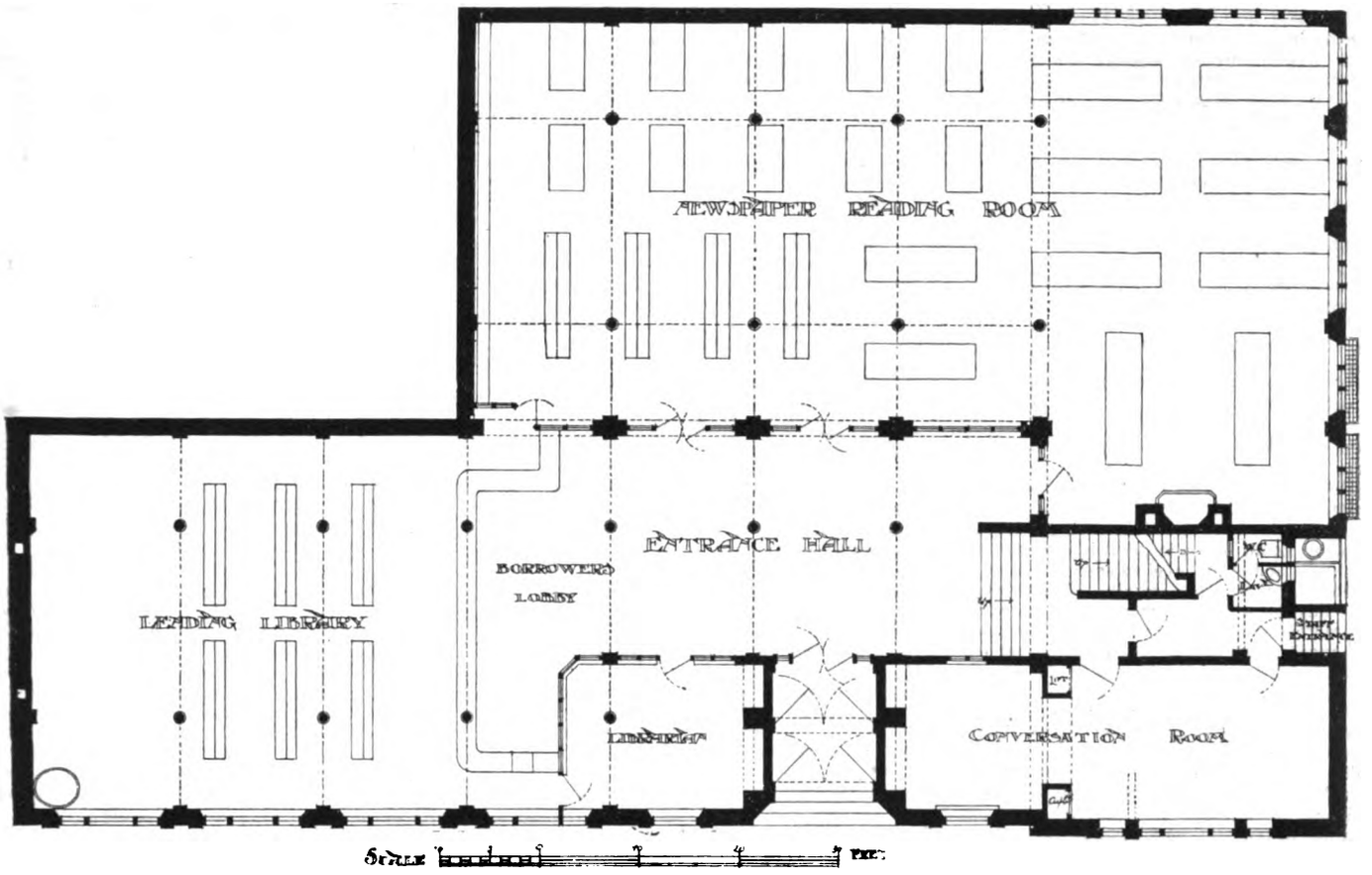

New Library, Keighley. Plan of Ground Floor.

Illustrations.

MEMORIAL CHAPEL, RIFREDI, FLORENCE.

THIS is a chapel erected in the churchyard at Rifredi, near Florence, from the designs of Signor Castellucci, architect, of Florence.

Signor Castellucci, we may mention, is one of the architects to the "Officio per la Conservazione dei Monumenti" at Florence, and it was he who, in conjunction with Signor Guido Carocci, the editor of *Arte e Storia*, worked out the design which, last year, obtained the first prize in the competition instituted by the "Accademia di Belle Arti," and the City of Florence for the best design for a better communication between the old centre of Florence and the left bank, by way of the Ponte Vecchio.

The chapel is built in the grey sandstone of Fiesole, called Pietra Serena. The walls are partly decorated in *sgraffito*. The pavement is in white marble inlaid with green and red marble (*verde di Prato* and *rosso di Maremma*).

The ceiling is in red terra-cotta, with blue ground to the panels, and relieved with gold; the interior frieze is treated in the same manner.

The roof is of thick slate from the quarries of Lavagna.

The whole cost of the work was about 11,000 *lire*.

The drawings for every detail were made full size by Signor Castellucci, who also carved in chalk the models of all the ornaments in relief. These ornaments were executed by Guiseppe Batistoni and Camillo Signori, carvers; the *sgraffito* by Vittorio Mugnai; the terra-cotta is from the manufactory of Signa; the bronze railing was executed by Tortoni, of Fiesole; the stained glass by Federigo Mossmeyer, of Florence; and the masonry by Egisto Salvadori.

NEW POST OFFICE, LAHORE.

THIS drawing shows part of a design submitted in competition for the above. The plans were prepared by the engineers of the P.W.D., architects being required to furnish elevations only. The materials to be used were brick and terra-cotta.

The drawing was exhibited in the Royal Academy last year.

M. STARMER HACK.

ENTRANCE TO NEW LIBRARY, KEIGHLEY.

THE new library at Keighley, near Leeds, is now being completed at a cost of 10,000*l*. The building occupies a corner site, with a frontage of 133 ft. to the main thoroughfare. It contains accommodation for 40,000 volumes, and includes a news-room 86 ft. by 40 ft. and a reference library 100 ft. by 38 ft.

In the exterior walling local stone of various quarries is used to obtain broken colour.

The contractors were:—Stonework, Messrs. Waddington Brothers; carpentry, joinery, and oak fittings, Messrs. Driver and Son; constructional ironwork, Mr. Jonathan Gill; heating and ventilation, Messrs. Dargue Griffiths.

The work has been carried out under the supervision of Messrs. Arthur E. McKewan and James A. Swan, of Birmingham, joint architects.

The drawing here illustrated was exhibited at the Royal Academy in 1902.

We give the plan of the ground floor. The first floor is occupied by the reference library (facing the longer frontage) and the patent library (over the shorter return front); the other portions of the plan, included in the angle between the two front blocks, are in one story only and top-lighted.

HOUSES, HIGH-STREET, MARYLEBONE.

THIS front, combining a house and two shops into one design, is by Mr. W. M. Brutton.

MOSS COTTAGE, PINNER.

THE drawing represents the latest state of a rambling old half-timbered country house which has been added to from time to time.

The latest alterations, carried out under the superintendence of Mr. W. H. Seth-Smith, have consisted in the addition of one or two rooms and the formation of a new hall.

BUSINESS PREMISES, HIGH HOLBORN.

THESE premises are built of Portland stone, and devoted to a shop on the ground floor and offices over.

They form part of the improvements involved in the new Kingsway scheme, a part of the old Kingsgate-street being absorbed in the site. Mr. A. Sykes is the architect.

COMPETITIONS.

KING'S COLLEGE HOSPITAL NEW BUILDINGS.—The Building Committee have appointed the following architects to take part in the competition for the appointment of architect of of the new buildings at Denmark-hill: Mr. E. T. Hall, Mr. A. Saxon Snell, Mr. J. H. T. Woodd, Mr. W. A Pite, Mr. W. Harvey, and Messrs. Campbell Douglas, and Paterson. Mr. Rowland Plumbe will act as assessor in the competition. The estimated initial expenditure is 300,000*l*. for buildings to accommodate 600 beds.

QUEEN VICTORIA MEMORIAL SCHOOL, SCOTLAND.—The appointment is announced of Mr. J. A. Campbell, of Glasgow, as architect of the proposed Memorial School for the Sons of Scottish Sailors and Soldiers. The Committee selected Mr. Campbell as their architect after consideration of various designs and plans submitted in competition.

Books.

Automatic Surveying Instruments and their Practical Uses on Land and Water. By THOS. FERGUSON, Member of the Shanghai Society of Engineers and Architects; with an introduction by E. Hammer, Ph.D., Professor of Geodesy at the Royal Technical High School of Stuttgart. London: John Bale, Sons, and Danielsson, Ltd. 1904.

ENGINEERS who have been occupied in surveys abroad often have useful suggestions to make with regard to surveying instruments more especially adapted for use in undeveloped countries. In the little book now before us we find a series of notes intended to bring together, for convenient reference, all information of practical value concerning certain types of automatic surveying instruments. The first instrument described is termed the "pedograph," an automatic route-tracer for pedestrians. As our readers are aware, various instruments are made by which pedestrians are enabled to make rough measurements of distance. In the pedometer a dial indicates the distance traversed in miles, the measurement being based on the assumed length of each step taken by the user; in the passometer the number of paces is indicated, thus leaving the operator to calculate the average length of his steps. Each type of instrument,

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as made in this country, resembles an ordinary watch in size and appearance, so that it can be conveniently carried. It happens, however, that in these watch-like contrivances the oscillating hammer is so delicately balanced and so light that it is apt to rebound and so to register more than the distance traversed, unless the user is very careful. Mr. Ferguson tells us that when using an instrument of this type he has found it possible "to assume a certain gait at which the instrument registers two paces for every step taken."

Consequently, his attention was turned to the production of a more reliable device, and the result was the invention of the pedograph. This is certainly far more serviceable than other instruments made for similar purposes. It consists of an oscillating frame, the motion of which causes a step-by-step progression of a ratchet-wheel, actuating a recording device which draws a facsimile of the route pursued upon a sheet of paper fixed in a frame, pivoted so that it can be adjusted to suit any deviation from the original line of progression. The apparatus is enclosed in a case measuring 12 in. by 12 in. by 2½ in., and is provided with a compass and spirit-level to assist the operator in obtaining accurate results. It is evident that this is a far more reliable instrument for practical work than ordinary step-measuring appliances, and the author shows that considerable accuracy is obtainable in practice. The pedograph should be especially useful for military and preliminary surveys of all kinds, as well as for filling in the details of rigorous topographical work.

The next instrument described is the "cyclograph," intended for the same purpose as the familiar "perambulator," but it is a more scientific instrument and suitable for adaption to a bicycle. The apparatus is contained in a flat box, and is so contrived that the path followed is traced on paper under the eyes of the observer. This instrument is, of course, far more accurate than the pedograph, and it is perfectly suited for use in any country where a bicycle can be ridden or pushed. Although the only practical results have been obtained from a series of tests made with a working model, these are sufficient to show that the instrument possesses great possibilities. In a series of trials made by the author in Holland, over fairly good country roads, a route was traced, measuring some six and a half miles long, at the rate of nine miles an hour, which appears to beat all previous records for rapid road surveying. With some minor alterations, the cyclograph can be adapted for use in hydrographic surveys, the containing box being then increased in dimension so as to provide accommodation for a larger sheet of paper.

The third instrument described by Mr. Ferguson is termed the "hodograph," which was designed by him as an aid to the mapping of various intricate systems of waterways in China. This instrument is intended to be fixed on a boat, and is driven by a propeller fan trailed in the water like a ship's log. Distances and directions are automatically traced upon an ordinary sheet of paper. The hodograph seems to be a most useful apparatus, and although not perfectly automatic it requires very little attention. The results cannot be so accurate as those taken by an instrument used on land, as various errors are necessarily caused by variations of current, leeway, and unequal slip of the propeller. Nevertheless, there are many places and circumstances in which it could be used with great advantage. We quite agree with the remarks made in the preface by Professor Hammer that the instruments described ought to be very useful in those branches of surveying which are comprised within the term geographic surveying. The book is clearly written and adequately illustrated, and we believe it will be of real service to surveyors practising abroad, as well as to students who wish to qualify themselves for work in the Colonies and foreign countries.

Strength and Elasticity of Structural Members. By R. J. WOODS, M.E., Mem.Inst.C.E., Fellow and Assistant Professor of Engineering, R.I.E. College, Cooper's Hill. London: Edward Arnold. 1903.

THIS work is the outcome of a series of lectures for students at the Royal Indian Engineering College, Cooper's Hill, and the aim of the author has evidently been to present theories and facts in a strictly practical manner, using simple and concise methods such as do not require more than an average knowledge of elementary mathematics. In dealing with a subject of this character it is obviously impossible for any writer to be original, unless he has been so fortunate as to discover some new law, or some hitherto unknown application of an old one. In the volume now under consideration the chief merit may be found in the admirable arrangement of the subject matter, and the lucid treatment pursued from beginning to end. As a preparation for the work to follow, the author gives in Chapter I. an excellent summary of the principles involved in Graphic Statics, accompanied by a number of diagrams illustrating the resolution of forces and the action of stresses in simple members and framed structures. The treatment of roof trusses in this chapter is very complete, dealing with applied loads and wind pressures on various types of roof construction, and showing the manner in which stress diagrams may most conveniently be constructed. The three succeeding chapters are chiefly devoted to definitions of Stress and Strain, Stress-Strain Diagrams, Working Stress, Resilience, and Compound Stresses, the whole of this being most necessary preliminary matter. Attention is next devoted in Chapter V. to Bending Moments and Shearing Forces, and here we notice that some of the diagrams are so drawn as to be even more intelligible to the student than those occurring in ordinary text-books. After elucidating methods of finding the moments of inertia of rectangular, triangular, and circular areas about different axes, Mr. Woods passes on to the consideration of stresses in girders, and in Chapter VIII. treats fully of the deflection of beams. An important point raised in the succeeding chapter relates to non-axial loads, the influence of which, we fear, is not always taken sufficiently into account in the preparation of designs. The same chapter includes some useful problems relating to the stability of masonry structures—such as dams, piers, and retaining walls—and the working out of the solutions is adequately illustrated by diagrams. A very short chapter is allocated to the subject of columns and struts, which really deserves more adequate treatment. The author confines himself chiefly to the elucidation of the well-known formulæ of Gordon and Rankine, neither of which express with any precision even the average results obtained from experimental investigation. Brief reference is made, it is true, to Professor Johnson's formulæ, but this chapter cannot be said to be entirely satisfactory. After dealing with riveted joints, the author proceeds, in Chapter XII., to consider various points in connexion with continuous girders, giving rules for determining the maximum bending moments in each span, the bending moments at the different supports, and the points of inflection. As continuous girders very frequently appear in building construction, this chapter should be a very useful one for architectural students. Chapter XIII. is a very brief discussion of cantilever bridges, suspension bridges, and arched ribs, and the concluding chapter deals with the theory of torsion, or twisting, a subject more particularly interesting to mechanical engineers.

In addition to examples worked out by the author, each chapter contains a number of exercises on the application of the principles therein explained. It will be seen, therefore, that the work is essentially adapted for the use of students, to whom it may be confidently recommended as a reliable guide.

Proceedings of the Incorporated Association of Municipal and County Engineers. Vol. XXIX., 1902-1903. Edited by THOMAS COLE, A.M.Inst.C.E. London: E. and F. N. Spon. 1903.

THIS volume contains papers on municipal work at Shipley, West Bromwich, Aldershot, King's Lynn, and Sudbury, and of these particular mention may be made of the exhaustive and clearly-illustrated paper by Mr. A. D. Greatorex on municipal work at West Bromwich. Of more general interest is the series of six papers on the ventilation of sewers and drains. They show that some municipal engineers are despairing of a satisfactory solution of this problem being found. One of the six authors seems to think that the necessity for ventilating sewers has not been proved, and three others advocate the abolition of the intercepting trap in order that house-drains and soil-pipes may serve as sewer-ventilators. This is not the first time that municipal engineers have expressed a desire to shift their responsibility for the ventilation of sewers on to the shoulders of architects, builders, and building-owners, and we must again strongly object to the proposal. In the discussion on the papers Mr. T. de Courcy Meade, the City Engineer of Manchester, very wisely said:—"I think it is to be regretted that younger members and graduates who are present to-day should hear so many seniors propose the abolition of the intercepting trap; it is a very dangerous principle to advocate, and I have risen simply to enter my protest against it; it is unscientific, and it is not the remedy for unventilated sewers." The volume contains two short papers on the bacterial treatment of sewage, by Dr. F. Clowes and Mr. W. D. Scott-Moncrieff, and others on "Trees in Public Roads," "Cremation," etc. It is clearly printed, and is altogether an interesting record of the Association's proceedings during the year 1902-3.

Paint and Colour Mixing: A Practical Handbook for Painters, Decorators, and all who Have to Mix Colours. By ARTHUR SEYMOUR JENNINGS. Second Edition. London: E. and F. N. Spon. 1904.

THE principal additions made in this edition of "Paint and Colour Mixing" consist of a chapter on washable and other water paints, a chapter entitled "Notes on Colour Harmony," and a short chapter on the mixing of colours with black japan. The number of plates constructed of strips of painted paper, representing the principal colours on the market, has been increased from four to eight, giving altogether examples of 171 colours.

The author is of opinion that house painters do not use black japan in coloured paints to the extent it deserves. Black japan mixed with orange chrome forms a chocolate brown, with lemon chrome a neutral green, and with Indian red a rich dark red. But the proportions to be used in producing these colours are not stated, and the mixer must experiment for himself with the mixtures until he obtains the desired tint.

In the chapter on "Greys and Grays" the author defines a "grey" as an admixture of black and white, while a "gray" is an admixture of black and white to which a colour has been added, but in which the black and white still predominate. This is not a good method of distinction, for the pronunciation of the two words is the same, and when making verbal inquiry for the desired colour it would be impossible to distinguish between "grey" and "gray."

Some portions of the book are written in the style of an advertising circular rather than in that of an instructive technical work. For example, the paragraph headed "Fireproof Paint" gives no information concerning the composition and manufacture of such paint, but merely gives the name and address of a firm which manufactures a fireproof paint. The same objection applies to the paragraph headed "Filling Up."

The book, however, though not a large one, contains much information and suggestive matter. Architects and builders will find it useful for reference purposes.

Modern House Drainage. Plans and diagrams by GERARD J. G. JENSEN, C.E. The Sanitary Publishing Company, 5, Fetter-lane, E.C. (No date.)

THIS publication consists of two sheets of drawings mounted on cloth and folded to fit into a cloth case. There is no letterpress. Sheet 1 contains illustrations of soil and waste pipes, and the methods of connexion to water-closets, lavatories, sinks, and bath. Four gully traps of different kinds and some other details are also given. The diagrams are clear, and show good types of plumber's work, but it is a pity that neither scales nor figured dimensions are inserted. The wiped joint between one of the sink traps and the waste pipe is incorrectly shown. Sheet 2 contains the ground-floor plan of a house with a complete and well-designed system of drainage, a longitudinal section of the main drain, and details of the manholes, air-inlets, etc. The general plan is drawn to a scale of about 16 ft. to an inch, the section is slightly larger but no scale is shown, and the details are drawn to two or three different scales, but here again there are neither scales nor dimensions. The soil-pipe described as E in the "Reference" is not lettered on the plan, and the number 7 is omitted from the title of one of the air-inlet details. These are perhaps trifling defects, but they certainly detract somewhat from the value of the drawings.

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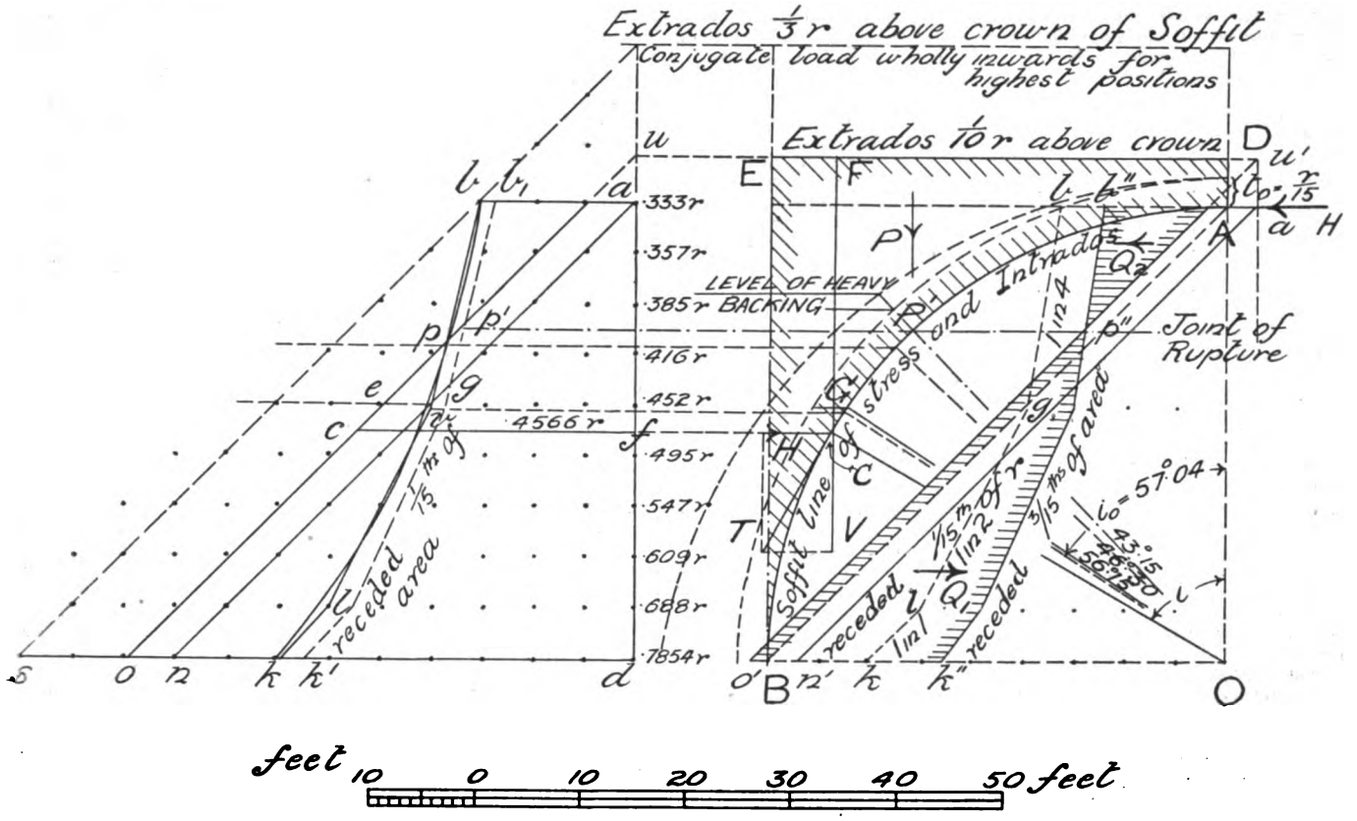

Fig. 61.

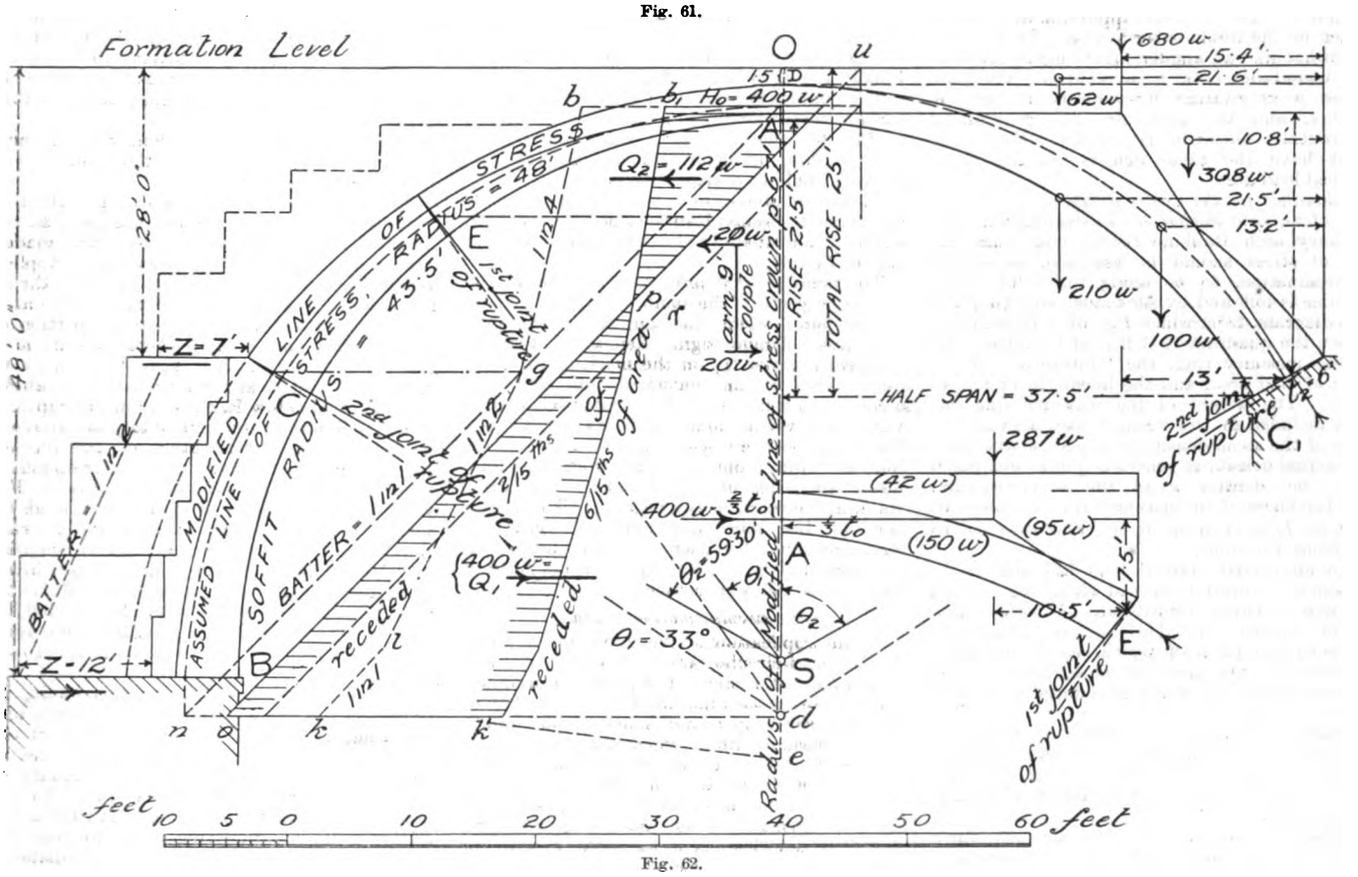

Fig. 62.

The Student's Column.

ARCHES.—XIV.

FOR the further elucidation of Alexander and Thomson's method of dealing with load areas we will now enter a little more fully into details.

Horizontal load area for a semi-circular rib, loaded uniformly along the rib.

Assume the uniform load along the rib, of which A C B, Fig. 61, is the left-hand half, to consist of a ring of unit density with a uniform thickness of half a radius = ½ *r*, so that the area of the part of the ring forming the load of any arc A C shall be equal to the area O A C.

By Navier's principle* the general expression for thrust at the crown is T = *p r*. In this case, adopting the symbol H_0, as in Fig. 61, to indicate crown thrust, and ½ *r* to represent *q* = *p*, the unit intensity of uniform pressure, and *r* the radius, we have

$$H_0 = \tfrac{1}{2} r \times r = \tfrac{1}{2} r^2.$$

This must be the area of the total horizontal load area *a b k d*, standing upon the base *a d*, the length of which is equal to *r*.

If the rib were balanced under the uniform load along the curve alone its form would be a catenary. Assuming the rib to have been intentionally pulled into a semi-circle, as in Fig. 61, the horizontal load to prevent lateral spreading must press inwards at each level, the intensity of the pressure diminishing from the springing to the crown. The breadth *f v* of the horizontal load area at the level of any point C on the rib may be found by the following formula, wherein *i* = the slope of the curve at C:—

$$f v = q = \frac{2i - \sin 2i}{3 \sin i - \sin 3i} r.$$

The breadths of the horizontal load area at ten equidistant points of *a d* are found by substituting in the expression for *f v* ten values of the angle *i*, whose cosines are 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 ninths of *r*, the radius, respectively.

These ten values are given in the second column of the following table, and indicate

* Article XII., p. 316.

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points on the true boundary *b k*, which is a regular curve. Values for an approximate boundary formed of the three battered lines *b g*, *g l*, and *l k*, are given in the third column of the same table.

Cos *i*.	Values for Curve.	Values for Treble Batter Line.
0	·333 *r*	·333 *r*
$\frac{1}{8}$	·357 *r*	·361 *r*
$\frac{2}{8}$	·385 *r*	·388 *r*
$\frac{3}{8}$	·416 *r*	·416 *r*
$\frac{4}{8}$	·452 *r*	·444 *r*
$\frac{5}{8}$	·495 *r*	·500 *r*
$\frac{6}{8}$	·547 *r*	·555 *r*
$\frac{7}{8}$	·609 *r*	·611 *r*
$\frac{8}{8}$	·688 *r*	·666 *r*
$\frac{9}{8}$	·785 *r*	·777 *r*

The approximate boundary is sufficiently accurate for all practical purposes, and encloses the exact area $\frac{1}{2} r^2$, required by the equation stated above.

Horizontal load area for a semi-circular rib loaded with the area between itself and a horizontal straight line over it.

Referring to Fig. 61, let A C B be the circular quadrant and D E the extrados or horizontal line over it. In the first place assume that, in addition to the shaded vertical load area D E B A, there is also a uniform load along the rib of intensity $= \frac{1}{2} r$. Then the 45 deg. slope *u o* gives the horizontal load area drawn on the base *a d* for the combined loads.

Now remove, in Fig. 61, the load along the rib, and at the same time remove the corresponding horizontal load area *a b g l k d*, drawn on the same base *a d* and supposed to gravitate horizontally outwards from the rib, while the first area gravitates horizontally inwards towards the rib. Hence, for the given vertical load area between the rib and the straight extrados, the horizontal load area lies between the line *u o* and the curve approximately represented by the treble batter *b g l k*. This area is somewhat like an angular figure eight, and the two boundaries cross at a point *p*. The part below *p* gravitating horizontally inwards is *positive*, and the part above *p* gravitating horizontally outwards is *negative*. Each part must have the same density as the given vertical load area.

Allowance for the excess weight of a masonry ring of uniform thickness.—In dealing with the masonry arch Rankine recommends that the line of stress should be assumed, as a first approximation, to be along the soffit. This practice is followed by Alexander and Thomson in a diagram, from which Fig. 61 is reproduced. Hence the quadrant A C B is at once the soffit of the masonry ring, the "intrados" of the vertical load area, and the linear rib or line of stress. The weight of the masonry ring has been included in the vertical load area as if it were of the same density as the superstructure. The actual density is generally $\frac{2}{3} w$, as compared with the density *w* of the superstructure. The thickness of the masonry ring is taken at $\frac{1}{15} r$, see $t_0 = \frac{r}{15}$ in the figure, and assumed to act along the soffit.

An additional vertical load has now to be considered uniformly spread along the rib and denoted by two concentric arcs $\frac{1}{15} r$ apart, and of the density $\frac{1}{2} w$. This load is exactly one-fifteenth of the load which, as a matter of convenience, was assumed along the rib, and the subtraction of which introduced the treble batter *b g l k*.

Consequently, it is only necessary to restore a fifteenth part of the area *a b g l k d* by pricking back $b\,b' = \frac{1}{15} b\,a$ and $k\,k' = \frac{1}{15} k\,d$, and similarly at *g* and *l*, and drawing the dotted treble batter *b' k'*.

Practically, then, with the line of stress assumed to be along the soffit, the allowance for a uniform masonry ring with an excess density of 50 per cent. and a thickness of one-fifteenth of the radius is made by receding the treble-batter boundary one-fifteenth.

Allowance for the excess weight of a masonry ring of varying thickness.—As the skewbacks of the segmental circular arch are usually 1·5 times the thickness of the keystone, the masonry ring may be taken to be included between two slightly eccentric circular arcs with their centres on one vertical line and their crowns at the distance t_0 apart and a pair of points, 60 deg. out from the crown, at the distance $2\,t_0$ apart. Two such arcs are indicated in Fig. 61 by the soffit and the upper dotted quadrant. The lower dotted arc is concentric with the soffit, and the excess weight of the part between these two arcs has already been considered. The two dotted circles touch at the crown A, and if completed their greatest distance apart would be at their lowest points, there equalling the difference of their diameters.

At the points right and left of the centre their distance apart is nearly the difference of the radii, slightly more or less according as the horizontal line is measured through one or the other centre. Hence the distance apart *z* of the two dotted quadrants measured along the radius through O, at any angle *i* out from the crown is approximately $z = 2\,t_0\,(1 - \cos.\ i)$.

An element of the area between the dotted circles is $z\,r\,d\,i$, and the vertical load area from the crown out to *i* is the definite integral of this between the limits O and *i*, whence the following expression for P is deduced*:—

$$P = 2\,t_0\,[r\,i - r \sin i].$$

Interpreting the two terms separately:—The first is a uniform load along the arc equivalent to the area between the two concentric circles $2\,t_0$ apart, and the second is a negative load uniform along the span. That is a parallelogram of the height $2\,t_0$ to be taken off the span. But since the excess weight is only $\frac{1}{2} w$, each of the uniform loads is to be an area of uniform breadth t_0 and of the normal density *w*, one added along the rib and the other taken off the span.

In Fig. 61, assume the load only to reach up to the horizontal through the crown A, the pair of parallelograms A E and *a o* being simultaneously removed. The conjugate horizontal load area is drawn inside the arch in dotted lines, one boundary being the dotted line A *g* B and the other the dotted treble-batter boundary *b g l k*. This last is to be receded three-fifteenths of the area *b* O by pricking back $b\,b' = \frac{3}{15} b$ A, and $k\,k' = \frac{3}{15} k$ O, and similarly at *g* and *l*. One-fifteenth part is due to the uniform part of the ring and the other two-fifteenths to the first term of the spread-out part. At the same time the boundary A B is to be receded one-fifteenth of a radius into the position *a' n'* due to the second term. Finally *a' o'* is to be added when A E is restored.

The conjugate horizontal load area as modified for the thickening-out ring is shown shaded in Fig. 61, the portion Q' being the portion of it pushing in below *p'*, and Q_2 the part above *p''* pulling horizontally outwards.

Alexander and Thomson next proceed to define and to discuss Rankine's point of rupture, which is indicated by the graphical construction in Fig. 61.

The point *p'* or *p''* projected horizontally on the circle gives P' the point of rupture, which is the point where the conjugate horizontal load area changes sign. Below P' there is required a thrust Q_1 on the back of the arch, and above P' an outward pull Q_2. The angle of rupture A O P', measured with a protractor, will be found to be 43 deg. 15 min. The joint between two voussoirs at P' is the joint of rupture, and the point where this joint meets the back of the masonry ring gives Rankine's level of heavy backing. The discussion of the point and joint of rupture by Alexander and Thomson is both interesting and instructive, but for our present purpose need not be followed further.

Semi-circular masonry arch.

In the application of the foregoing methods to the semi-circular arch, of which the left-hand quadrant is shown in Fig. 62, the assumed line of stress is the quadrant *a n*, of 48 ft. radius, with the centre at *d*, and taken up the middle of the masonry ring, which has a thickness A D $= t_0 = 3$ ft. at the crown and a thickness $t_3 = 6$ ft. at the joint near C which is 60 deg. out from the crown. The ring is formed by two eccentric circles, one being the soffit A E C B, described from the centre S with the radius S A = 43·5 ft., and the other described from the centre *e* with the radius *e* D = 52·5 ft. Beyond the joint C the back of the ring is stepped to receive the heavy backing, a portion of which virtually forms part of the arch ring.

From *a* at the middle of the keystone the line *a b* is laid off equal to one-third of 48 ft., the mean radius; then *b g* is drawn with the batter of 1 in 4, so that *g* is at a level four-ninths of 48 ft. lower than *b*; then *g l* is drawn with the batter of 1 in 2, so that *l* is four-ninths of 48 ft. lower than *g*, and *l k* is drawn with the batter of 1 in 1; while *a g n* is drawn through *a*, the crown of the assumed line of stress with the batter of 1 in 1.

These dotted lines include the conjugate horizontal load area, neglecting the weight of the half of the arch ring below the assumed line of stress, and the excess weight of the other half over the average weight of the superstructure. The load between a horizontal line through *a* and the formation level is also neglected.

Assuming the density of the arch ring masonry to be $\frac{2}{3} w$, and that of the superstructure to be *w*, the excess density of the lower half of the ring will be $\frac{1}{3} w$, and that of the upper half will be $\frac{1}{2} w$. Conjointly the excess weight of the ring is *w*, and, as this is double the excess weight taken for Fig. 61, the boundaries must recede twice the previously ascertained distances. Hence in Fig. 62 the treble-batter boundary *b g l k* will recede six-fifteenths of the area to the position of *b' k'*, the boundary *a n* will recede two-fifteenths of 48 ft. when there is added to it the parallelogram *u o* equal to the parallelogram between the horizontal through *a* and the formation level, which is at the height *a* O = 3 ft. above the point *a*.

The area *p k' o*, the positive part of the load area, is found by measurement or calculation to be almost exactly 400 sq. ft., so that $Q_1 = 400\,w$ is the inward thrust to be resisted by the solid backing. To give the required reaction the backing must extend from the springing joint B to a distance of z = 12 ft., this dimension being determined in the following manner:—The weight pressing the backing down upon its base is $z \times 48\,w$, and, taking the co-efficient of friction of masonry on masonry at 0·7, we have

$$z = 400\,w \div 48 \times 0{\cdot}7 = 12, \text{ nearly.}$$

Above the level of *p*, the conjugate horizontal load required to act outwardly is $Q_2 = 112\,w$, and if it were practicable to apply this load the line of stress would be the circle of 48 ft. radius, and the thrust at the crown $H_0 = (Q_1 - Q_2) = (400\,w - 112\,w) = 288\,w$.

Rankine recommends* that the heavy backing should be continued up to a level nearly corresponding with *p* in Fig. 61, but in the present case it is only necessary to bring the backing up to the level of *g*, as the thickening of the ring is sufficient backing down to that point.

For a masonry ring of uniform thickness heavy backing may come to the level of *p* as recommended by Rankine.

In the present case a part of the positive area Q_1 from *p* to *g* is left out, as well as the negative part Q_2. This positive part, shaded across, is not entirely left out, being applied lower down, so that the whole inward thrust $Q_1 = 400\,w$ is applied to the back of the arch between joints B and C. An equal portion of the negative area from *p* upwards $= 20\,w$ is also shaded across, and thus two joints of rupture E and C are determined, one above and the other below Rankine's joint of rupture.

The omission of the horizontal load above C necessitates the modification of the line of stress from that joint to the corresponding joint on the other side of the crown. For want of the outward pull Q_2 the arch tends to shrink horizontally and the crown to rise. This brings the centre of stress at the crown joint down from the bisecting point to the lower trisecting point. As the crown thrust H_0 is now greatly increased, $400\,w$ must be divided by A D + D O or $6\,w$, giving the radius of curvature of the modified line of stress at its crown, $\rho_0 = 67$ ft.

A circle described with this radius, having its centre on the vertical through the crown, and beginning at the lower trisecting point of the crown joint A, crosses the assumed line of stress and approaches the upper boundary of the middle third of the arch ring. At the point E a thrust of a little more than $400\,w$ has shifted from the bisecting point to near the upper trisecting point of the joint, a distance of nearly 6 in. This is the same as applying at E' the upper end of the block C E, a left-handed couple of $400\,w + \frac{1}{2} = 200\,w$, taking the place of the couple $20\,w \times 9$ ft. constituted by the shaded parts of the horizontal load area above and below *p* which was left out so far as the block C E was concerned.

Three points on the left half of the modified line of stress (Fig. 62) are the lower trisecting point of the crown joint A, the upper trisecting point of the first joint of rupture E, and a point slightly above the middle of the second joint of rupture C.

The verification is as follows. Consider the part A C to be rigid, and see whether the three forces acting upon it meet at a point:—(1) The weight of the structure from C to O =

* "Elementary Applied Mechanics," p. 496.

* "Civil Engineering," p. 424.

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680 w, acting downwards through the centre of gravity; (2) the horizontal force H_0 = 400 w acting horizontally through the lower trisecting point of the crown joint; and (3) the oblique thrust near the middle of the joint C. Taking moments about the last point, we have 680 w × 13 ft. and 400 w × 22 ft. approximately equal. It is then only necessary to show that the whole weight from A down to C = 680 w, and the centre of gravity 15·4 ft., measured horizontally from the right-hand vertical boundary. The weights and leverages of four parts into which the area O A C can be divided are figured on the right half of Fig. 62.

Again consider the structure rigid from A to E, when the three forces must again meet at a point:—(1) The vertical force = 287 w through the centre of gravity; (2) the horizontal force = 400 w through the lower trisecting point of the joint A; and (3) an oblique force parallel to the tangent of the line of stress acting through the upper trisecting point of E. Taking moment about this last point, we have 400 w × 7·5 ft. approximately equal to 287 w × 10·5 ft. The areas and levers of the various regular forces into which the area under consideration can be divided are printed on the lower part of the right half of Fig. 62.

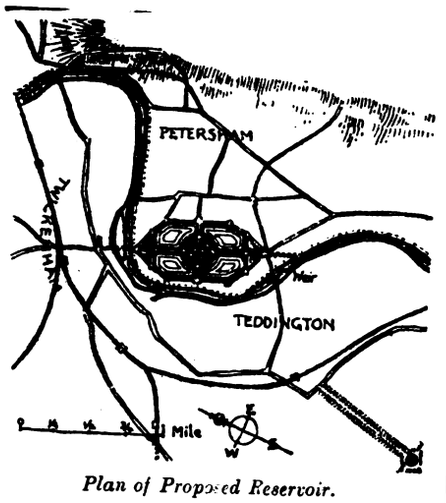
In this way a segmental arch is indirectly designed, the half span of the soffit being 37·5 ft., the rise of the soffit 21·5 ft., the formation level being 4·5 ft. above the crown of the soffit, and the total rise of the formation above the springing level is 26 ft. Five points on the line of stress are known—viz., A, E, and C—and two points on the right half of the arch corresponding with the points E and C on the left half.

Light elastic rubble spandrels to a stretch of 7 ft. are shown above the heavy backing, but these are intended merely to exert horizontal reaction when the live load comes on the opposite side of the arch. Their horizontal resistance is 7 × 23 w × 0·7 = 113 w.

Correspondence.

PROPOSAL FOR A RESERVOIR ON THE THAMES.

SIR,—I send you a rough plan of a suggestion for a reservoir, to hold from 400 to 500 million gallons of water, on a site formed by a bend of the river between Teddington and Twickenham.



Plan of Proposed Reservoir.

The scheme also includes new roads and bridges opening up a district which might be used for building.

A great quantity of material would have to be removed, but might be disposed of profitably, and the work, extended over several years, might help the solution of the "unemployed" question in the locality of London.

J. K.

BOOKS RECEIVED.

GREAT MASTERS. Part XII. (W. Heinemann. 5s.)

THE TECHNOLOGICAL AND SCIENTIFIC DICTIONARY. Part I. (Geo. Newnes. 1s.)

BUILDERS' QUANTITIES. By Herbert C. Grubb. (Methuen and Co. 4s. 6d.)

OBITUARY.

MR. JOHN PETHICK.—On Tuesday, March 29, Mr. J. Pethick succumbed to the injuries sustained in a serious carriage accident on the previous Saturday. Essentially the architect of his own fortunes, Mr. Pethick carved out for himself a career which remains a monument to his business aptitude, enterprise, and energy. Mr. Pethick was born in July, 1827, his father being the manager of the Dartmoor Granite Works, now owned by the firm of Pethick Bros., the well-known contractors. Leaving school at the age of twelve, he was apprenticed to a carpenter, at Turnchapel, and early achieved the reputation of being one of the most skilled craftsmen in the district. When twenty-five years of age he entered into partnership with Mr. Benjamin Call as a builder and contractor. The partnership lasted nearly twenty years, and during that time the firm carried out many important works, among which may be mentioned the railway stations at St. Thomas, Exeter, Newton, Kingswear, and the Duke of Cornwall Hotel and Chubb's Hotel, at Plymouth. In 1871 the partnership was dissolved, and one of the first of Mr. Pethick's large contracts after the dissolution was the erection of new Guildhall and Municipal Buildings at Plymouth, which were opened by the King and Queen, then the Prince and Princess of Wales, in 1874. As a Government contractor, Mr. Pethick carried out many important works in the West of England, including the construction of No. 3 dock at Devonport Dockyard, and the Royal Naval College, at Keyham. He was largely responsible for the extension of the residential area of Plymouth, and for the clearance of some of its slums. He also erected the Grand Hotel on the Hoe, and the first block of workmen's dwellings, known as Bate's Buildings, at Plymouth, and Kelly College, at Tavistock. With Mr. Relf, he constructed the line from Lydford to Friary, 22 miles in length, which gave the London and South-Western Railway for the first time an independent route to Plymouth. This line was opened in 1886, and cost nearly 800,000*l*. Besides numerous cuttings, it comprises two long tunnels and a number of viaducts, of which a noteworthy example is one spanning the river Tavy. In conjunction with his sons he constructed the Vale of Glamorgan Railway from Barry to Bridge End, a distance of some 22 miles. In the Yeo Valley, he built the Bristol Corporation reservoir, and among other works were the construction of the Vale of Rheidol Light Railway from Aberystwith to Devil's Bridge, the reconstruction in granite of many of the viaducts for the Great Western Railway on their Cornish lines, and the erection of a number of country mansions in the western counties. Mr. Pethick was the builder of numerous churches, and many public buildings. Since 1874 Mr. Pethick has been connected with the Town Council of Plymouth, and he served in the office of Mayor during the two years, 1898-1899 and 1899-1900. As a member of the Board of Guardians for many years, he took a lively interest in the welfare of the poor, and an active part in movements for the relief of the unemployed. Mr. Pethick materially aided the church extension movement in the Three Towns by gifts of granite for new churches. When Smeaton's lighthouse was taken down from the Eddystone rock, Mr. Pethick provided, at his own cost, the present granite base required for its re-erection, and but for his generosity it is doubtful whether Plymouth would now have been in possession of the Smeaton Tower, which is so familiar a landmark on the Hoe. Mr. Pethick's name is familiar to our readers in connexion with the foundations and piers of the new Vauxhall Bridge and the widening of London Bridge, both of which contracts he lived to see completed.

GENERAL BUILDING NEWS.

WAREHOUSE, GLASGOW.—The Magasin des Tuileries in Sauchiehall-street, Glasgow, was opened on the 21st ult. The buildings were formerly known as the Corporation Galleries, where for half a century the Corporation art treasures were housed. These have now been transferred to Kelvingrove; but part of the old building is still devoted to art, the exhibitions of the Royal Glasgow Institute of the Fine Arts being held there. The remainder is occupied by MM. Treron et Cie., the proprietors of the Magasin des Tuileries. The warehouse has a frontage to Sauchiehall-street of 245 ft. There are in all forty-eight show windows, thirty-five of these being in Sauchiehall-street and the others in Rose-street and Dalhousie-street. One of the chief features of the building is the dome at the corner of Sauchiehall-street and Rose-street. The warehouse is decorated and furnished in the style of the period of Louis XIV. Mr. Burnet was the architect.

BATHS AND LIBRARY, SHEFFIELD.—A block of public buildings, containing baths, and a library and reading-room, has just been completed for the Park Ward, Sheffield. The work has been carried out from the designs of the City Surveyor (Mr. C. F. Wike) and his staff by the Works Construction Department at a total estimated cost of 18,600*l*. The buildings are of brick, with stone facings, and form a rectangular two-storied block, with a main frontage to Duke-street, and other frontages to Samson-street and Coates-street, while the fourth side overlooks open ground, on which there is room for extension up to the building line of a new street. A feature of the building is the high chimney stack (120 ft.) used in connexion with the boiler furnaces for heating the water used in the baths. The swimming bath runs parallel with Samson-street, and is entered from that thoroughfare. It is 75 ft. long and 30 ft. wide, with a bottom sloping from a depth of 3 ft. at the shallow end to 6 ft. at the deep end. Round the two sides and the shallow end of the bath are dressing boxes, about forty in number, and provision has been made for the construction at some future time of a gallery above the dressing boxes. The bath is lined with blue and white bricks. Also on the ground floor there are eight men's slipper baths, and four ladies' slipper baths, office, conveniences, etc., and on the floor above are placed the caretakers' rooms, and another series of eight men's slipper baths. There is a steel and glass roof over the bath. In the basement are the boilers, coal cellars, laundry, mangling-room, driers, etc., in connexion with the baths. A subway extends all round the swimming bath. The library portion of the premises face Duke-street, and is entirely shut off from the baths. The Lending Library, on the ground floor, and entered from Duke-street, is 76 ft. by 25 ft. A space at one end is screened off as an office for the librarian, the body of the room will be occupied by shelving, and at the end of the room nearest the entrance there is a portion, 18 ft. by 19 ft., which the public will use. Over the Lending Library, on the first floor, is a reading-room of corresponding size, 76 ft. by 25 ft., with a wood-block floor. The reading-room is approached by a wide staircase, with stone steps and glazed brick wall. The buildings at night are lighted throughout by electricity, arc lamps being used over the swimming-bath. Besides the Works Construction Department, the following contractors have been engaged on various parts of the work:—Joiner's work, C. Portass; iron and steel work, W. Ward; engineering and heating apparatus, Moorwood, Sons, and Co.; plumbing and glazing, H. Braithwaite and Co.; and slating and plastering, Charles Chadwick.

TOWN HALL EXTENSION, BRADFORD.—At a meeting of the Finance and General Purposes Committee of the Bradford Corporation on the 24th ult. Mr. F. E. P. Edwards, the City Architect, submitted sketch plans for the proposed extension of the Town Hall. The original scheme provided for the addition of a story to the present building, besides an extension on the site of the old Conditioning House, the approximate cost of the scheme being about 100,000*l*. This proposal the Council vetoed, and the architect was instructed to confine his attention to a new building where the Conditioning House formerly stood, with some structural alterations to the present hall. The present scheme proposes to connect the old and new buildings by a corridor, which will be a continuation of the existing main entrance. This entrance is to be considerably enlarged and improved by taking in the present Council Chamber. The new Council Chamber will be in the centre of the extension, and will accommodate 100 members, in addition to seats for officials and the Press, giving an increase of fifteen seats. The new education authority will be transferred to the new portion, whilst the collector's, architect's, and other departments, at present located in different places in the town, will be transferred to the Town Hall. the Tramways Department being the only one to remain outside. The new frontages have been designed in the Gothic style, to harmonise with the present Town Hall, and the new building will have six stories. The plans, it is stated, met with general approval, and will be submitted in due course to the City Council. The estimated cost of the scheme is 70,000*l*.

ISOLATION HOSPITAL, HAMPTON.—The new Isolation Hospital which has been erected by the District Council in the Uxbridge-road, Hampton Hill, near its junction with Burton's-road, was opened on the 19th ult. In 1902 plans for the hospital were prepared by Mr. S. H. Chambers, the Council's surveyor, and these were sanctioned by the Local Government Board, and the tender of Mr. E. Chamberlain, of Addlestone, at 3,400*l*., was accepted.

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The buildings are of stock bricks, with dressings of red Leicestershire sand stocks and patent indurated stone. The roofs are boarded, felted, and covered with Westmorland slates. The accommodation is for ten beds, and the several blocks consist of administrative block, ward pavilion, laundry and disinfecting station, and ambulance station and mortuary. All the blocks are over 40 ft. apart, and the land enclosed leaves room for extensions for some time to come. The buildings are electrically lighted by the Twickenham and Teddington Electric Supply Co. Owing to the limited sum at the disposal of the Council and the present size of the hospital, only a small administrative block has been erected, but as the requirements increase this block will be used as an entrance lodge, and a larger block erected for the matron and nurses.

FREE LIBRARY, GOOLE.—The memorial stones of the new free library at Goole were laid on the 28th ult. Mr. H. B. Thorpe is the architect and Mr. J. Walker is the contractor. The new library will cover an area of about 400 square yards, having a frontage of about 50 ft. to the south side of Carlisle-street and a total depth of about 72 ft. The accommodation on the ground floor will consist of a reading-room, an entrance hall leading to the counter of the lending library, a juvenile room, and a reference library and offices. Nearly the whole of the second story will be taken up for a lecture-room. Externally, facing Carlisle-street, the building will be of red brick, with red Ruabon terra-cotta facings.

THE HENRY SUGDEN MEMORIAL HALL, BRIGHOUSE.—The opening took place on the 26 ult. of the new hall built at the Bridge End Congregational Church, Brighouse, in memory of the late Ald. Henry Sugden, J.P. The hall, which will seat 600, has been erected from plans by Messrs. Sharp and Waller, architects, Brighouse, over a series of one-story classrooms, and has a frontage to the main road connecting Brighouse and Rastrick. The total cost has been about 1,800*l.*

RIDLEY HOUSE, BETHNAL GREEN.—The foundation stone of Ridley House, erected in connexion with the Church of St. James-the-Less, Bethnal Green, was laid recently. The new buildings have been built from the designs of Mr. E. Hoole, architect.

BANKING PREMISES, SHEFFIELD.—A new building has been erected at the corner of High-street and Angel-street, Sheffield, for the Sheffield branch of the York City and County Bank. The frontage is 63 ft. long, and the depth of the premises 77 ft. The front of the ground floor is of Aberdeen granite, the portion above being of carved Hopton wood stone. The building is lighted with electricity. The roof is flat, and is of concrete and asphalte. Concrete is also used for most of the flooring and the partitions. On the ground floor there is the large banking hall. The walls and counter fronts are of marble, and there are a number of square marble columns. The clerks' and upper office section entrance is floored with marble mosaic, and behind the counters the floor is of wooden blocks. The window and door fittings on the ground floor are of bronze, and the other fittings of the banking hall are made of Italian walnut and mahogany. At the back of the counters are screens of inlaid Italian walnut. To the left of the large entrance to the banking hall is a fireplace of inlaid marble, near the top being the Sheffield coat of arms. The ground floor also consists of the manager's room and waiting-room, both of which are fitted in Italian walnut. On the same floor also there is a stationery room, with fittings of stained wood. There are two suites of offices on the first floor, a suite of offices on the second floor, and the next floor comprises three suites of offices and caretakers' rooms. In the basement there are two strong-rooms, clerks' rooms, etc., and there is also a sub-basement. The banking premises are heated throughout with hot water. The architect is Mr. Walter Brierley, of Lendal, York; Messrs. Longden and Sons were the contractors, and Mr. A. S. Woodhead has superintended the fitting of the interior.

ALTERATIONS TO THE TOWN HALL, FOLKESTONE.—On Thursday, the 24th ult., an inquiry was held at the town hall into an application by the Town Council for permission to borrow 4,400*l.* for alterations to the town hall buildings, according to plans prepared by Mr. Reginald Pope. The architect, in explaining his plans, said that the floor space of the large hall would be decreased, but the gallery accommodation considerably increased, and there would also be separate exits.

BUSINESS PREMISES, PICCADILLY.—At the corner of Air-street, Piccadilly, new premises have been erected for Messrs. J. C. Cording and Co., Ltd. The architect of the building is Mr. Harold A. Woodington; and Messrs. Howard and Co., of Covent Garden, have been the builders.

SANITARY AND ENGINEERING NEWS.

GAINSBOROUGH WATER UNDERTAKING.—On the 23rd ult. was celebrated the completion of a scheme of water supply which has occupied the attention of the Gainsborough Urban Authority for twenty years. The boring, which is the largest sunk for waterworks purposes in the kingdom, if not in the world, naturally involved difficulties and delays of no ordinary kind; in fact, owing to the breaking of the boring rope and the burying of the boring tool at a depth of 725 ft. from the surface, this work was practically at a standstill for twenty months. However, through patience and perseverance on the part of the contractors (Messrs. E. Timmins and Sons, Ltd., of Runcorn), the boring tool was at last recovered, and the boring completed to a total depth of 1,515 ft. in 1900. Mr. Jabez Church having died in 1896, the District Council appointed his partner and successor (Mr. Percy Griffith, M.Inst.C.E., F.G.S.) as engineer to the scheme, and to him fell the duty of dealing with the pumping machinery required. The capacity of the pump was fixed between a maximum of 60,000 gallons per hour and a minimum of 40,000, and a double-acting "concertina" pump, with Ashley's multiple valves, was specified. Contractors were invited to submit their own designs for the engine, and that of Messrs. Combe, Barbour, and Combe, of Belfast, was accepted. On starting the pumps it was ascertained that the minimum yield could not be obtained, but since that time the actual yield has increased from 29,000 gallons per hour to 32,000 gallons, and there is every reason to believe that as time goes on the fissures in the sandstone will open out, and a still further supply will be secured. The present yield is, however, more than sufficient for the maximum requirements of the town.—*Sheffield Telegraph.*

DRAINAGE WORKS, ASTON.—In the early part of last year the Aston Surveyor (Mr. G. H. Jack) prepared a scheme for the storm-water drainage of the whole of the district at a cost of 56,500*l.* For a long time the local authority has been cognisant of the fact that the main sewers were inadequate to take both storm water and sewage matter, the result being that properties were flooded. So serious were the complaints received that the Highways Committee recognised the desirability of remedying the evil as early as possible. Owing, however, to the other large schemes on hand in the district, the Council has not thought it advisable to proceed with the scheme as a whole. Therefore it was decided to deal with the most urgent parts of the district first, and, in accordance with this, works have already been carried out at Witton. On the 29th ult., Mr. F. H. Tulloch, M. Inst.C.E., inspector of the Local Government Board, conducted an inquiry at the Council House, Aston, into the application of the Council for power to borrow 2,500*l.*, for works of drainage at Aston Cross, which is one of the points requiring immediate attention.—*Birmingham Daily Post.*

SEWAGE SCHEME, MORLEY.—At the monthly meeting of the Morley Town Council the Borough Engineer (Mr. W. E. Putman) explained the plans for the completion of the sewage purification works, and a discussion took place on the proposal of the Sewage Purification Committee that the scheme and plans be approved, and that application be made to the Local Government Board for sanction to the borrowing of the sum of 18,000*l.* for carrying out the works. It was ultimately decided to adopt the recommendation of the Committee.—*Yorkshire Daily Observer.*

FOREIGN.

FRANCE.—The Municipal Council of Paris have voted a sum of 41 million francs for the construction of new schools.——A new artesian well in the XIIIth arrondissement of Paris was inaugurated last week.——The President of the Republic opened last week the new Bretonneau Hospital for Children at Montmartre, in Rue Etex and Rue Carpeaux, and also a new fire brigade barracks in Rue Carpeaux, which was described in the *Builder* two years ago, when the members of the Congress of Architects visited it. M. Héneux is the architect of both buildings.——The Lycée Saint-Louis, Paris, is to be enlarged, and at the same time the Rue de Vaugirard prolonged to the Boulevard Saint-Michel. The total cost will be about 1,250,000 francs, to be shared equally between the State and Municipality of Paris.——An asylum for aged men is to be built at Lille, the cost being defrayed by a citizen of the town, M. Wanoschot.——The Chamber of Deputies has under consideration a bill for the enlargement of the town of Lyons, by taking in the suburban communes of Villeurbane, St. Rambert, Ile Barbe, and Calaires.——A sanatorium for consumption, especially intended for French school teachers of both sexes, is to be built at Guéret, on the south-western slope of Puy-de-Gaudy.——The new Hôtel de Ville at Sens was opened last Sunday. It is from the designs of two Parisian architects, M. Dupont and M. Poivert. Its cost has been 945,000 francs.——The "Société Académique d'Architecture" of Lyons has given the following subjects for its annual competition for this year:—In architecture, an Ecole des Beaux-Arts: in archæology, a drawing of an ancient house in the Rue Lainerie; and in decorative art, designs for a stair balustrade and for lamp pendants for a drawing-room.——The Government has given orders for the removal of the crucifixes and other religious emblems placed in the Courts of Justice. In consequence of this order, it is probable that the "Christ," by M. Bonnat, which decorates the Assize-court of the Seine Department, will be sent to the Petit Palais. The celebrated triptych, by Van Eyck, which formerly decorated the old large chamber of the Parliament House, and is at present in the First Chamber of the Civil Court, will probably be sent to the Louvre.——During next session, the Municipal Council of Paris will again be occupied with the question of the Boulevard Haussmann, the prolongation from Rue Taitbout to the Boulevard Montmartre which has been long desired, and which it will cost the city about 15 million francs to carry out.——The restoration of the ancient church of St. Pierre at Montmartre, which has been interrupted, is to be continued, the cost being divided between the State and the Municipality.——The death is announced, at the age of 63, of M. Edouard Boulanger, architect, pupil of the Ecole des Beaux-Arts and of Constant Dufeux. He obtained in competition the commission for the cathedral of Saigon, and in 1883 he was architect for the French section of the International Exhibition at Amsterdam. He became, about the same time, a member of the Société Centrale des Architectes.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The work of Mr. John W. Simpson, F.R.I.B.A., and of Mr. Maxwell Ayrton, A.R.I.B.A., will in future be carried on in partnership at 3, Verulum-buildings, Gray's Inn, W.C.——Mr. W. E. H. Clarke, architect (Hereford), has removed his offices from 4, Portland-street to Cathedral Chambers, King-street, Hereford.

"RECENT EXCAVATIONS IN THE ROMAN FORUM."—In our review, under the heading "Books" last week, the statement in a quotation from the book, that part of the inscription of Augustus in regard to the altar of Vulcan was "found in 1848," should have been corrected to "1548." The author of the review being on a journey at the time, his corrected proof did not reach us till too late.

MANCHESTER INFIRMARY.—Mr. E. J. Milner Allen writes to say that the accepted design for the rebuilding of the infirmary on the Piccadilly site, at Manchester, referred to in our article of last week was the joint work of Mr. Simpson and himself, though Mr. Simpson alone, as stated in our article, was responsible for the design submitted in the recent competition.

UNDERGROUND ROOMS IN ST. PANCRAS.—The Public Health Committee of the London County Council reported as follows at the meeting last week of the Council:—"We reported on February 2 last that when inquiry was made in the Metropolitan Borough of St. Pancras by the Medical Officer of Health as to the number of underground rooms illegally occupied as dwellings, it was found that over 400 tenements, affording accommodation for more than 1,000 persons, were occupied separately, although they contravened the provision of the law relating to underground rooms beginning to be occupied after 1855. As a result of a subsequent inspection of the district, the Borough Medical Officer reported that there were 640 rooms in which the conditions were practically irremediable, and he suggested that these rooms should be dealt with consecutively and at intervals, 'so as to avoid the serious effects of suddenly displacing a large population.' The first set of notices, dealing with fifty houses, was served by the Borough Council on August 7, 1903, and since that date the Borough Council has decided to serve further notices as follows—on December 15, fifty-eight; on January 13, twenty-seven; and on March 2, ninety; making 225 in all. We understand that it is proposed to serve further notices at intervals so that all the houses which are illegally occupied will be dealt with by the end of the summer of this year. The Council, on December 22, 1903, decided to press the Borough Council to proceed with more rapidity in the matter, and we are glad to observe that substantial progress is now being made. We will report later as to the effect of the notices served by the Borough Council."

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NATIONAL REGISTRATION OF PLUMBERS.—The annual meeting of the Leeds District Council for the National Registration of Plumbers was held on Friday last week at the Leeds Institute of Science, Art, and Literature. The annual report, which was presented to the meeting, refers to the number of plumbers added to the register during the past year as being satisfactory, and urges that all plumbers not at present on the register should take steps to become registered while they are able to do so under the present conditions. The following resolution was passed unanimously:—"That this meeting of the Leeds District Council for the National Registration of Plumbers records its emphatic opinion that the time has arrived when the voluntary system of registration for plumbers, carried on in Leeds and other large centres of population in the United Kingdom by the joint action of the public authorities and the plumbers, should be placed on a statutory basis, on lines already approved by the Local Government Board, in the interests of public health and economy, and that such legislation is a necessary adjunct to the powers already exercised by sanitary authorities and the water undertakings of the Kingdom."

GEOLOGICAL EXCURSIONS.—Professor Seeley, King's College, London, will conduct ten geological excursions to examine the main channel of the Thames and some of its tributaries, to begin April 23, at Purfleet, where the Thames flows over the chalk.

SHEFFIELD MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Sheffield Master Builders' Association was held on the 29th ult. at the Building Trades' Exchange, Cross Burgess-street, Mr. J. D. Cook (President) in the chair. The loyal toasts having been honoured, Mr. J. Biggin proposed "The Corporation, City, and Trade of Sheffield." He remarked that in Sheffield at the present time people were discussing the question of house providing. They as builders were of opinion that this should be left to private enterprise, so far as private enterprise could cover it. But in Sheffield there was a class of houses required that private enterprise could not provide. There were thousands of men in Sheffield—labourers and others—whose average wage, taking the year round, did not exceed 1*l.* a week. It was not possible for these to pay more than 4s. a week rent. Houses of this class were not provided by private enterprise, and he thought it was the duty of the Corporation to step in and provide them. Private enterprise, he contended, did enough for everybody else except this class in this direction. They agreed that the water, tramways, electric light, and the markets should be in the hands of the Corporation, but were absolutely unanimous that public work paid for out of public funds should be put up for public competition. If that were done the Works Construction Department might shut up at any moment. It was not possible for any class of men to carry on a Works Construction Department successfully in competition with the open market. Certain parties were doing their utmost to revive this department, but if all the councillors of Sheffield were to unite in an effort to revive the department he thought they would eventually fail.—Councillor Lancashire first responded, and in the course of his remarks he referred to the Water Committee, which, he said, was now a paying concern, and he looked to it to materially reduce the rates. They were just completing one of the largest reservoirs at Langsett, and the work of another was half way through, so that in eighteen months or two years they would have an immense supply, sufficient not only for Sheffield, but also for Rotherham, Doncaster, and the Don Valley. As to the Works Construction Committee, he expressed his continued opposition to it. Alderman Nixon, who also responded, spoke of the need of sound business men on the Corporation. Referring to the housing question, he spoke of the severity of the Local Government Board regulations, compelling the erection of houses commensurate with those destroyed, thus putting up the expense. He also expressed himself opposed to the Works Construction Department as an injustice to those trading in competition with it. The toast of "The House of Commons" was submitted by Councillor Longden, and Alderman Batty Langley, M.P., responded. In reference to the Works Construction question in Sheffield, he thought it possible to form a committee to do repairs, large and small, without conflicting with the honourable competition of builders. He never believed the Sheffield builders had been in collusion with reference to any tender given in regard to large buildings. The Works Construction Committee, he added, was not quite done for, but owing to the withdrawals, it had had a severe shaking. When it rose again it would have to occupy a vastly different position. Mr. H. Hodkin submitted the toast of "The National Association" and "The Yorkshire Federation." Councillor Longden, one of the vice-presidents of the latter federation, in responding, spoke of the usefulness of federation in the prevention of strikes, proving a blessing to both masters and workmen in the building trade. The toast of "The Architects and Surveyors of Sheffield" was also honoured, on the proposition of Mr. A. J. Forsdike, Mr. Thomas Winder responding. Mr. Charles Hadfield gave "The Sheffield Master Builders' Association." The President (Mr. J. D. Cook), in reply, spoke of the better understanding now existing between builders and architects in Sheffield. Their Association, he added, was last year admitted to membership of the Sheffield Chamber of Commerce. This recognition, he contended, ought to have come before, considering the importance and extent of their industry. "Our Guests" was given by Mr. Joseph Coward, the City Surveyor (Mr. C. F. Wike) and Mr. J. J. Bingham responding.

YORKSHIRE COUNTY COMMITTEE AND CLIFFORD'S TOWER.—The quarterly meeting of the Yorkshire County Committee was held at York Castle recently, Mr. C. J. Milnes Gaskell in the chair. The final report from Mr. Micklethwaite, F.S.A., with reference to Clifford's Tower was read, and a draft of rules for the admission of the public were submitted and considered. The military prison at the Castle is close to Clifford's Tower, and for that reason, before the rules are finally adopted they will have to be approved by the Prison Commissioners. It was hoped by the meeting that by July, or perhaps earlier, the public would again be admitted to the tower. The structure, it was stated, is now in a secure condition, and the timber supports and shoring are about to be loosened and removed gradually.

DERBY MASTER BUILDERS' ASSOCIATION.—The annual dinner of the members of the Derby Master Builders' Association was held recently at the County Hotel, Mr. Joseph Dickinson (President) in the chair. The loyal toast having been honoured, Mr. J. V. Porter proposed "The Mayor, Magistrates, and Corporation," the responders being Mr. W. J. Piper and Councillors Eaton and Brown. Mr. W. E. Starkey, in proposing "Success to the Midland Federation and Derby Master Builders' Association," contended that it had done good work, and pointed out that in various ways it might be made more useful. The President, in responding to the toast, claimed that the Federation was an excellent organisation, and that as to the Derby Master Builders' Association all it desired was justice between man and man. Whilst it endeavoured to safeguard the interests of the employers, its members wished to deal fairly and squarely with their men. The building trade was passing through a period of depression, and he asked for the Association an increased measure of support. The Vice-President also acknowledged the toast. Other toasts followed.

RUSSIAN TIMBER TRADE.—Mr. Consul-General Smith, reporting on the trade, etc., of Odessa and district, writes that the timber market was quiet, the only real demand being for French staves, for which 20*l.* 2s. 7d. to 20*l.* 13s. 2d. per 1,000 were quoted at Odessa port at the beginning of the year. The trade in oak wood for building purposes has, during the last two years, declined, especially in the sorts destined for the United Kingdom. This is owing, Mr. Smith considers, to the fact that America has been largely exporting to the United Kingdom, thereby causing heavy losses to local dealers.

CAPITAL AND LABOUR.

JOINERS' WAGES AT BRIGHOUSE.—In accordance with a code of rules and regulations agreed upon some years ago between the employers and employed in the Brighouse joinery trade, the operative carpenters and joiners served their employers with a notice six months ago for an advance in wages of ½d. per hour, totalling to 3s. per week, making the rate of wages in Brighouse the same as in Halifax, Huddersfield, and other surrounding towns. At present the rate paid in Brighouse is 7½d. and 8d. per hour. The new rate should have come into operation on the 1st inst., but owing to the depression in the building trade in the Brighouse district the workmen have decided, it is stated, to withdraw the notice and go on at the old terms.

ABERDEEN JOINERS.—The Aberdeen Masters' Association have intimated to the operatives that they do not propose to make any change in the rate of wages in the course of the year. They suggest, however, certain minor alterations in the by-laws, and these have been remitted to a committee for consideration. It is a stipulation of the by-laws, agreed to by employers and men, that the side desiring any change in the conditions of work must give notice at this period of the year.

THE BUILDING TRADE AT BARROW.—A dispute has arisen between the master builders at Barrow and the men employed in various branches of the building trade. The masters desire all the trades, with the exception of painters, to work shorter hours in winter. At present the winter hours are fourteen weeks at 49 hours, and the men are asked to work 47 hours during November and February, and 41½ during December and January. Further, when allowing "walking" time, that the Central railway station gates shall be considered the centre of the town, instead of the Town Hall as at present. The masters have offered to refer the matter to arbitration, and the plasterers have agreed to this. Other trades, however, are declining to start except on the old terms. It is thought there will be either a strike or a lock-out.—*Sheffield Daily Telegraph.*

Legal.

DECISION UNDER THE LONDON BUILDING ACT, 1894:

ASHBRIDGE *v.* EVANS.

MR. ASHBRIDGE, District Surveyor for St. Marylebone, recently summoned Mr. Evans for having done certain work in, to, or upon a building, consisting of digging trenches under, and in close proximity to, the walls of a house in Queen-street, Edgware-road, for the purpose of re-draining, without first giving him notice under the Act.

Mr. Andrews, from the Solicitors' Department of the London County Council, by direction of the Council, appeared in support of the summons, and, having called the attention of the magistrate, Mr. Curtis Bennett, to certain sections of the Act, explained that the trenches in question had been dug under the rear wall of the house, through the centre of the building under the basement floor and along the side front, the latter trench being in an area and coming within a few inches of the side front and causing the house to at once comence to collapse, no proper shoring having been erected before the commencement of the work.

He further explained that it became necessary for the building to be dealt with promptly as a dangerous structure case, and that at the request of the District Surveyor the house was immediately shored up by the Works Department of the London County Council, and afterwards almost entirely demolished under an order obtained before Mr. Plowden. Thus, by prompt action, what might have been a very serious accident—possibly attended by loss of life—was averted.

The defendant having admitted the facts of the case, and having explained that he did not know that he was required to give notice, the magistrate inflicted the maximum penalty of 40s. with 23s. costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

5,221 of 1903.—A. BELL: *Manufacture of Register Grates and the like.*

This relates to the manufacture of register grates and the like. In carrying out the invention a platform is provided with two side wings, and extended at the back with a frame to carry a grating. The platform is made in various widths corresponding to the size or width of the fire, and the frame at the back is also made to correspond to the inside size of the firebrick back of the grating. The two wings at the sides of the platform are provided with hooks or other means of attaching the platform to the front of the grate, and the invention when in use will form the bottom grating or stand upon which the fire is placed with an extended front.

6,251 of 1903.—I. JONES: *Locks and Latches, Fitted with End-way Moving Bolts.*

A lock or latch case having a movable bolt, which is engaged in being drawn in. The case is provided with guides to prevent the bolt from falling inside the case owing to wear or other cause.

7,710 of 1903.—J. FORDHAM and A. S. CLARKE: *Chimney and Ventilating Shaft Tops, applicable also to Stoves for Preventing Down Draught.*

A top or device for chimney and ventilating shafts, comprising a vertically-arranged tube adapted to be attached to the top or bottom of the chimney or shaft, a truncated cone forming an extension of said tube, a fan so mounted above said cone as to be capable of

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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rotation in a plane at right angles to the axis of the cone, a skirt in the form of an open tube surrounding the truncated cone at a convenient distance therefrom, and a hood carried above the said fan.

8,177 of 1903.—H. L. DOULTON and R. J. PLEACE: *Fittings for Water-closets and the like.*

In cisterns for flushing closets and the like, the adoption of a syphonic arrangement having two outlet legs, one leg being connected to the closet inlet and the second leg being utilised, when the water descends, for withdrawing air by suction from the outlet of the closet.

8,233 of 1903.—J. WALKER: *Appliances for attaching to Domestic and other Fireplaces for Increasing the Draught.*

In a draught-inducing device of the character described in the specification of the prior Letters Patent No. 13,434 of 1884, the combination with the main body or plate formed with a semi-spherical depression therein of a series of holes passing through the plate below the depression and outstanding flanges at either side of the series of holes.

8,345 of 1903.—J. DYKES, A. DYKES, and A. DYKES: *Fluid Pressure Cranes or Lifts.*

An improvement in cranes or lifts actuated by fluid pressure, the said improvement consisting of the whole combination of two cylinders and two rams and a system of distributing valves, one of the said cylinders and rams fitted with a high multiplying gear, and the other said cylinder and ram with a single gear, and accompanied, if necessary, by one or more lead pulleys, the said cylinders and rams actuated by fluid pressure, such pressure passing through the said distributing valves of such construction as to allow either ram or cylinder to be uplifted independently of the other substantially by manipulating the said distributing valves.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 18.—By DAVID ROBERTS & SON (at Corwen).

Corwen, Merioneth.—Fronhyfryd, four freehold houses, including rights of way	£790
Mount-st., seven freehold houses	165
Hill-st., "Penbryn Cottage" and six other cottages, f.	465
London-rd., three freehold houses and shop	635
Brook-st, three houses and seven cottages, f.	465
Aber-view, two cottages, workshop, mission room, yard, etc., f.	360
Rose-pl., five houses, also gdns, etc., f.	385
Cynwyd, Merioneth.—Eight houses and shop (post office), f.	340

March 22.—By W. H. SHINER & WINTER (at Yatton).

Nailsea, Somerset.—"Bartlett's Farm." 23 a. 0 r. 9 p., f.	1,450
"Foster's Farm," 20 a. 0 r. 17 p., f.	1,225
Various enclosures of land, 24 a. 1 r. 2 p., f.	875
Kenn, Somerset.—"Decoy Farm," 86 a. 2 r. 27 p., f.	1,600

March 26.—By DAVID ROBERTS & SON (at Bala).

Trawsfynydd, Merioneth.—"Glanllafar Farm," 211 a. 3 r. 28 p., f., y.r. 55*l.*	1,250
"Nantbudr" "Nantlliwgys" and "Caerhingylliad" Farms, 404 a. 2 r. 21 p., f., y.r. 110*l.*	2,600

March 28.—By BRODIE, TIMBS, & Co.

Totteridge, Herts.—"Loxwood" and 1 acre, u.t. 94 yrs., g.r. 30*l.*, p.	2,000

By ELLIOTT, SON, & BOYTON.

Regent-street.—Nos. 153 and 155 (s.), u.t. 15½ and 16¼ yrs., g.r. 27*l.* 5s. 1d., y.r. 627*l.* 5s. 1d.	6,375

By WM. HOLLIS.

Hendon.—Finchley-la., "Ivy Villa," f., e.r. 65*l.*	890

By J. & S. MOTION.

Bow.—131, Bridge-st. (s.), f., y.r. 35*l.*	500

By C. SPARROW & SON (at Finchley).

Mill Hill.—Main-rd., a Freehold Building Estate, area 7¼ acres	3,100
Finchley.—24, 26, and 28, Lodge-la., u.t. 73 yrs., g.r. 12*l.*, w.r. 66*l.* 6s.	425
4, Long-la. (s.), f, y.r. 50*l.*	740

By C. RAWLEY CROSS & Co. (at Kew Bridge).

Ealing.—41, Chandos-av., u.t. 98 yrs., g.r. 4*l.* 10s., w.r. 32*l.* 10s.	235
Chandos-av., etc., f.g. rents 35*l.* 10s., reversion in 98 yrs.	800

By OLIVER & APPLETON (at Darlington).

Great Aycliffe, Durham.—19 Closes of Land, u.t. 981 yrs., g.r., etc., 84*l.* 10s., y.r. 155*l.*	1,130

By R. C. S. EVENETT (at Greatham).

Bordon, Hants.—Kingsley Brick Works, area 13 acres, f., p.	1,600

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, APRIL 8.

Junior Institution of Engineers (Westminster Palace Hotel).—Paper on "The Heating and Ventilation of Factories," by Mr. Kenneth Gray. 8 p.m.

Glasgow Architectural Craftsmen's Society.—Business Meeting. 8 p.m.

SATURDAY, APRIL 9.

Incorporated British Institute of Certified Carpenters.—Monthly Meeting. Mr. H. Eustice on "Timbering in Mines," illustrated by lantern slides. 6 p.m.

Northern Architectural Association.—Excursion Meeting. Members to assemble at the Infirmary, the Leazes, Newcastle, at 3 p.m.

MONDAY, APRIL 11.

Society of Engineers.—Mr. H. C. H. Shenton on "The Latest Practice in Sewage Disposal." 7.30 p.m.

Institute of Sanitary Engineers, Ltd.—(1) Examination and Literary Committee. 4 p.m. (2) Organising Committee. 6 p.m. (3) By-laws Committee. 7 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—7 p.m.

Liverpool Architectural Society.—Annual General Meeting: Election of Council and Officers. 6 p.m.

Bristol Society of Architects.—Annual General Meeting. Election of Council and Officers. 8 p.m.

TUESDAY, APRIL 12.

Institution of Civil Engineers.—Mr. E. W. de Rusett on "Recent Developments in Cargo and Intermediate Steamers." 8 p.m.

WEDNESDAY, APRIL 13.

Architectural Association (Discussion Section).—Paper by Mr. W. E. Davis, entitled "A Retrospect, Vol. I. of *The Builder*."

Sanitary Institute (Lectures for Sanitary Officers).—7 p.m. (Visit to East London Soap Works, Bow. 3 p.m.)

Institution of Civil Engineers.—Students' Visit to the Works of the Great Northern, Piccadilly, and Brompton Railway, in course of construction. 2.30 p.m. Assemble at the Brompton-road Station site, adjoining the Oratory.

Institute of Sanitary Engineers, Ltd.—(1) General Purposes and Finance Committee. 4 p.m. (2) Election Committee. 5.15. (3) Sessional Meeting, when a discussion will be opened by Mr. A. A. H. Scott on "Combined Drainage." 7 p.m.

THURSDAY, APRIL 14.

Royal Institution.—Professor Dewar, M.A., on "Dissociation," I. 5 p.m.

Institution of Electrical Engineers.—(1) Continuation of Discussion on paper on "Direct-Reading Measuring Instruments for Switchboard Use," by Messrs. K. Edgcumbe and F. Punga. (2) Mr. M. B. Field on "Eddy Currents and Eddy Current Losses in Cable Sheaths." 8 p.m.

FRIDAY, APRIL 15.

Institution of Mechanical Engineers.—Paper to be further discussed: "Compound Locomotives in France," by M. Edouard Sauvage, Chief Consulting Engineer, Western Railway of France. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—7 p.m.

TO CORRESPONDENTS.

S. S. P.—(Below our limit).——W. A. C.—(Amount should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER and *not* to the Editor.

PRICES CURRENT OF MATERIALS.

**** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks	1	16	0	per 1000	alongside, in river.	
Rough Stocks and Grizzles	1	13	0	,,	,,	,,
Facing Stocks	2	12	0	,,	,,	,,
Shippers	2	10	0	,,	,,	,,
Flettons	1	10	0	,,	at railway depôt.	
Red Wire Cuts	1	13	0	,,	,,	,,
Best Fareham Red	3	12	0	,,	,,	,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,,	,,

BRICKS, &c.—(*continued*).

	£	s.	d.			
Best Blue Pressed Staffordshire	4	4	0	per 1000	at railway depot.	
Do. Bullnose	4	10	0	,,	,,	,,
Best Stourbridge Fire Bricks	4	8	0	,,	,,	,,
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	13	0	0	,,	,,	,,
Headers	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	17	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers	16	0	0	,,	,,	,,
One Side and two Ends	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamferred, Squints	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers	14	0	0	,,	,,	,,
One Side and two Ends	15	0	0	,,	,,	,,
Two Sides and one End	15	0	0	,,	,,	,,
Splays, Chamferred, Squints	14	0	0	,,	,,	,,
Second Quality, White and Dipped Salt Glazed	2	0	0	,,	less than best.	

	s.	d.		
Thames and Pit Sand	7	3	per yard,	delivered.
Thames Ballast	6	0	,,	,,
Best Portland Cement	30	0	per ton,	,,
Best Ground Blue Lias Lime	21	0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s.	d.			
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.		
Do. do. delivered on road waggons, Nine Elms Depôt	1	8¼	,,	,,	
PORTLAND STONE (20 ft. average)—					
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	1	,,	,,	
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	2½	,,	,,	

	s.	d.			
Ancaster in blocks	1	11	per ft. cube,	deld. rly. depôt.	
Beer ,,	1	6	,,	,,	
Greenshill ,,	1	10	,,	,,	
Darley Dale in blocks	2	4	,,	,,	
Red Corsehill ,,	2	5	,,	,,	
Closeburn Red Freestone	2	0	,,	,,	
Red Mansfield ,,	2	4	,,	,,	
YORK STONE—*Robin Hood Quality*					

	s.	d.			
Scappled random blocks	2	10	per ft. cube,	deld. rly. depôt.	
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per foot super.	,,	
6 in. rubbed two sides ditto, ditto	2	6	,,	,,	
3 in. sawn two sides slabs (random sizes)	0	11½	,,	,,	
2 to 2½ in. sawn one side slabs (random sizes)	0	7½	,,	,,	
1½ in. to 2 in. ditto, ditto	0	6	,,	,,	
HARD YORK—					
Scappled random blocks	3	0	per ft. cube	,,	
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super.	,,	
6 in. rubbed two sides Ditto	3	0	,,	,,	
3 in. sawn two sides (slabs random sizes)	1	2	,,	,,	
2 in. self-faced random flags	0	5	,,	,,	
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube.		
,, ,, ,, 6 in. sawn both sides landings	2	7	per ft. super. deld. rly. depôt		
,, ,, ,, 3 in. do.	1	2½	,,	,,	

SLATES.

in.	in.	£	s.	d.		
20	10 best blue Bangor	13	2	6	per 1000 of 1200 at r. d.	
20	12 ,, ,,	13	17	6	,,	,,
20	10 best seconds ,,	12	15	0	,,	,,
20	12 ,, ,, ,,	13	10	0	,,	,,
16	8 ,, ,,	7	0	0	,,	,,
20	10 best blue Portmadoc	12	12	6	,,	,,
16	8 best blue Portmadoc	6	12	6	,,	,,
20	10 best Eureka unfading green	15	2	6	,,	,,
20	12 ,, ,,	17	2	6	,,	,,
18	10 ,, ,,	12	10	0	,,	,,
16	8 ,, ,,	10	5	0	,,	,,
20	10 permanent green	11	10	0	,,	,,
18	10 ,, ,,	9	10	0	,,	,,
16	8 ,, ,,	6	10	0	,,	,,

TILES.

	s.	d.		
Best plain red roofing tiles	42	0	per 1000 at rly. depôt.	
Hip and Valley tiles	3	7	per doz.	,, ,,
Best Broseley tiles	50	0	per 1000	,, ,,
Do. Ornamental tiles	52	6	,,	,, ,,
Hip and Valley tiles	4	0	per doz.	,, ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000	,, ,,
Do. Ornamental do	60	0	,,	,, ,,

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TILES—(*continued*).

	s. d.		
Hip tiles	4 0	per doz. at rly. depôt.	
Valley tiles	3 0	,,	,, ,,
Best Red or Mottled Stafford shire do. (Peakes)	51 9	per 1000	,, ,,
Do. Ornamental do.	54 6	,,	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,
Best "Rosemary" brand plain tiles	48 0	per 1000	,, ,,
Best Ornamental tiles	50 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000	,, ,,
Do. pressed	47 6	,,	,, ,,
Do. Ornamental do	50 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 6	,,	,, ,,

WOOD.

	£ s. d.		£ s. d.
	At per standard.		
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15 10 0		16 10 0
Deals: best 3 by 4	14 10 0		15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0		12 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in.	9 0 0		9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0		9 10 0
Foreign Sawn Boards—			
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.	
¾ in.	1 0 0	,,	
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0		5 0 0
Seconds	4 5 0		4 10 0
Small timber (8 in. to 10 in.)	3 12 6		3 15 0
Small timber (6 in. to 8 in.)	3 0 0		3 10 0
Swedish balks	2 15 0		3 0 0
Pitch-pine timber (30 ft. average)	3 5 0		3 15 0

JOINERS' WOOD.

	At per standard.		
White Sea: first yellow deals, 3 in. by 11 in.	23 0 0		24 0 0
3 in. by 9 in.	21 0 0		22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0		18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0		20 0 0
,, ,, 3 in. by 9 in.	17 10 0		19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0		14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0		16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0		12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0		22 10 0
Do. 3 in. by 9 in.	18 0 0		19 10 0
Battens	13 10 0		15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0		17 0 0
Do. 3 in. by 9 in.	14 10 0		16 0 0
Battens	11 0 0		12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0		14 0 0
Do. 3 in. by 9 in.	13 0 0		14 0 0
Battens	10 0 0		11 0 0
White Sea and Petersburg:—			
First white deals, 3 in. by 11 in.	14 10 0		15 10 0
,, ,, 3 in. by 9 in.	13 10 0		14 10 0
Battens	11 0 0		12 0 0
Second white deals, 3 in. by 11 in.	13 10 0		14 10 0
,, ,, 3 in. by 9 in.	12 10 0		13 10 0
,, ,, battens	9 10 0		10 10 0
Pitch-pine: deals	16 10 0		20 0 0
Under 2 in. thick extra	0 10 0		1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.	
Oddments	24 0 0		26 0 0
Seconds, regular sizes	26 10 0		28 10 0
Yellow Pine oddments	22 0 0		24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6		0 5 0
Danzig and Stettin Oak Logs—			
Large, per ft. cube	0 2 6		0 3 6
Small ,, ,,	0 2 3		0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0		0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7		0 0 8
¾ in. do. do.	0 0 6½		—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9		0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6		0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10		0 1 0
Teak, per load	17 0 0		21 0 0
American Whitewood Planks— per ft. cube	0 4 0		—
Prepared Flooring—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 6		0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0		0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0		1 0 0
1 in. by 7 in. white, planed and shot	0 12 0		0 14 6
1 in. by 7 in. white, planed and matched	0 12 6		0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0		0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0		0 13 6
¾ in. by 7 in. do. do. do.	0 14 0		0 18 0
1 in. by 7 in. white do. do.	0 10 0		0 11 6
in. by 7 in. do. do. do.	0 11 6		0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.		£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	...	7 5 0
Compound Girders, ordinary sections	8 2 6	...	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	...	8 17 6
Flitch Plates	8 5 0	...	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6	...	8 5 6

METALS.

	Per ton, in London. £ s. d.		£ s. d.
IRON—			
Common Bars	7 5 0	...	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0	...	8 5 0
Staffordshire "Marked Bars"	10 0 0	...	—
Mild Steel Bars	8 15 0	...	9 5 0
Hoop Iron, basis price	9 5 0	...	9 10 0
,, ,, Galvanized	17 10 0	...	—
('And upwards, according to size and gauge.)			
Sheet Iron (Black)—			
Ordinary sizes to 20 g.	9 15 0	...	—
,, ,, 24 g.	10 15 0	...	—
,, ,, 26 g.	12 5 0	...	—
Sheet Iron, Galvanised, flat, ordinary quality—			
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	...	—
Ordinary sizes to 22 g. and 24 g.	13 5 0	...	—
,, ,, 26 g.	14 5 0	...	—
Sheet Iron, Galvanised, flat, best quality—			
Ordinary sizes to 20 g.	16 0 0	...	—
,, ,, 22 g. and 24 g.	16 10 0	...	—
,, ,, 26 g.	18 0 0	...	—
Galvanised Corrugated Sheets—			
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0	...	—
,, ,, 22 g. and 24 g.	13 0 0	...	—
,, ,, 26 g.	13 15 0	...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0	...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0	...	—
,, ,, ,, 26 g.	14 0 0	...	—
Cut nails 3 in. to 6 in.	9 0 0	...	9 10 0
(Under 3 in., usual trade extras.)			

LEAD, &c.

	Per ton, in London £ s. d.		£ s. d.
LEAD—Sheet, English, 3lb. and up	14 15 0	...	—
Pipe in coils	15 5 0	...	—
Soil pipe	17 15 0	...	—
Compo pipe	17 15 0	...	—
ZINC—Sheet—			
Vieille Montagne ton	26 5 0	...	—
Silesian	26 0 0	...	—
COPPER—			
Strong Sheet per lb.	0 0 10½	...	—
Thin ,, ,,	0 0 11½	...	—
Copper nails ,,	0 0 11	...	—
BRASS—			
Strong Sheet ,,	0 0 10	...	—
Thin ,, ,,	0 0 11	...	—
TIN—English Ingots ,,	0 1 4	...	—
SOLDER—Plumbers' ,,	0 0 6½	...	—
Tinmen's ,,	0 0 8	...	—
Blowpipe ,,	0 0 9	...	—

ENGLISH SHEET GLASS IN CRATES.

	2d. per ft. delivered.	
15 oz. thirds	2d.	,,
,, fourths	1½d.	,,
21 oz. thirds	3d.	,,
,, fourths	2½d.	,,
26 oz. thirds	3½d.	,,
,, fourths	3d.	,,
32 oz. thirds	4½d.	,,
,, fourths	4d.	,,
Fluted Sheet, 15 oz.	2½d.	,,
,, 21 oz.	3½d.	,,
⅛ Hartley's Rolled Plate	1½d.	,,
¼ ,, ,, ,,	1½d.	,,
½ ,, ,, ,,	2½d.	,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 6
,, ,, in drums	,,	0 1 9
Boiled ,, ,, in pipes or barrels	,,	0 1 9
,, ,, in drums	,,	0 2 0
Turpentine, in barrels	,,	0 3 7
,, in drums	,,	0 3 9
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	,,	19 0 0
Best Linseed Oil Putty	per cwt.	0 7 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

CAPE TOWN.—For Cape Town Exhibition Stand, for Messrs. S. Chivers & Sons, Ltd. Messrs. George Baines & R. Palmer Baines, architects, 5, Clement's-inn, Strand, London, W.C.:—

Kerridge & Shaw £297
*W. Saint, Devonshire-road, Cambridge .. 257

CORK.—For improvement and repair to No. 1, Patrick's-hill. Messrs. W. H. Hill & Son, architects, 28, South-mall, Cork:—

W. J. O'Mahony, 4, Ard Bara* £400

CROWLE.—For pulling down Wesleyan Chapel and erecting new chapel, vestries, etc., at Crowle, Lincs. Mr. T. Brownlow Thompson, architect, 15, Parliament-street, Hull. Quantities by architect:—

Bourne & Wilkinson	£3,793	0	4	W. Barton	£2,150	0	0
A. E. Pearce	2,994	19	6	B. Ashton & Son	2,149	2	10
W. Clarke & Son	2,784	12	0	H. Kelsey, sen.	2,120	0	0
A. J. Elmes	2,745	4	9	H. Kelsey, jun.	2,106	0	0
T. Wood	2,691	8	0	Exors. J. E. Bowman & Son	2,070	18	6
F. W. Wilson	2,665	0	0	Train	2,066	7	6
F. M. Thompson	2,547	19	6	T. Cooke	2,050	0	0
H. T. Arnott	2,350	0	0	R. Stewart	2,038	0	0
H. Kaye	2,333	3	0	S. R. & T. Kelsey	2,019	17	10
J. Walker	2,272	17	6	Amalgamated Builders			
C. Sprakes & Sons	2,250	0	0	D. Gill & Son, Doncaster*	1,977	0	0
J. R. Woods	2,215	0	0				
E. Good & Son	2,158	11	9				

DURHAM.—For the construction of sewage tanks and filter beds, etc., near Sherburn House Colliery, for the Rural District Council. Mr. G. Gregson, Surveyor to the Council:—

A. Errington	£269 0 0	J. Carrick, Durham*	£255 5 8
J. G. Bradley	260 0 0		

DURHAM.—For the construction of 645 lineal yards of 12-in. pipe sewer and sewage tanks and filter beds, etc., near Framwellgate Moor, for the Rural District Council. Mr. G. Gregson, Surveyor to the Council:—

J. Carrick	£1,916 15 6	A. Errington, Hetton-le-Hole*	£1,797 0 0
J. G. Bradley	1,895 0 0		

FOLKESTONE.—For proposed alterations, Town Hall, Folkestone. Mr. R. Pope, architect, 17, Cheriton-place, Folkestone:—

Wallis	£4,549	Hayward & Paramor	£3,789
White	4,196	Castle & Son	3,749
Fearon	4,149	Smith & Son	3,489
Tunbridge	4,076	Parsons*	3,350
Crosswell	3,850		

GRANGEMOUTH (Stirling).—Accepted for the erection of bakery, stables, byre, van shed, etc., for the Co-operative Society, Ltd. Messrs. Wilson & Tait, architects, 9, Armfield-place, Grangemouth. Quantities by architects:—

Digger, Mason, and Brick Work: J. J. & P. McLachlan, Larbert	£3,350 0 0
Carpenter and Joiner Work: A. Williamson & Son, Grangemouth	1,137 18 3
Plumber, Gasfitting, and Ventilating Work: Atken Bros., Grangemouth	726 14 9
Iron and Steel Work: P. & W. McLellan, Glasgow	696 7 2
Plaster, Cement, and Tiler Work: James Russell, Grangemouth	417 0 0
Slater Work: J. Stewart, Bainsford, Falkirk	329 4 0
Glazier Work: D. O'May, Falkirk	127 16 8

GOSPORT.—For erecting depot for Gosport and Fareham Electric Tramways at Hoeford, for the Provincial Tramways Company, Ltd. Mr. John Glenn, C.E., architect, 11, Queen Victoria-street, London, E.C., and Gosport:—

	Power Station.	Car Shed.	Workshops.	Total.
S. Salter	£6,610 ..	£3,800 ..	£1,495 ..	£11,905
M. Jones	6,530 ..	3,795 ..	1,525 ..	11,850
J. Croad	6,400 ..	3,700 ..	1,450 ..	11,550
W. Ward	6,074 ..	3,805 ..	1,346 ..	11,225
Evans & Sons	5,988 ..	3,779 ..	1,372 ..	11,139
J. Crockerell	5,270 ..	3,725 ..	1,383 ..	10,378
M. Quick	5,300 ..	3,620 ..	1,345 ..	10,265
M. Coltherup	5,365 ..	3,433 ..	1,275 ..	10,073
F. Corke	5,139 ..	3,619 ..	1,282 ..	10,040
H. C. Sweetland*	5,435 ..	3,275 ..	1,060 ..	9,770

GOSPORT.—For constructing tramways for electric traction at Gosport and Fareham, for the Provincial Tramways Company, Ltd. Mr. John Glenn, engineer, 11, Queen Victoria-street, London, E.C., and Gosport:—

——	Gosport.	Gosport to Hoeford.	Hoeford to Fareham.	Gosport to Alverstoke.	Feeder Cables.	Total.
	£	£	£	£	£	£
Pethick Bros.	26,757	11,053	18,637	9,060	9,040	74,527
C. L. Duke	26,108	10,362	17,335	8,588	9,132	71,525
J. Mowlem & Co., Ltd.	24,306	9,822	17,053	8,459	8,585	69,225
W. Griffiths, Ltd.	23,302	9,887	16,573	8,275	9,132	67,169
Blackwell & Co., Ltd.	23,528	9,391	16,771	8,119	9,133	66,942
Dick, Kerr, & Co., Ltd., London*	22,979	9,607	17,047	7,872	9,320	66,825

TENDERS—*Continued on page 401.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums	Designs to be Delivered
*New Brick Church	St. Anne's Church Building Com. ..	10*l.*	May 31

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Carnegie Public Library, Atherton	.....	Bradshaw & Gass, Architects and Surveyors, Bolton	April 9
Mason's Labour, Residence at Askwith, near Otley	.....	Empsall & Clarkson, Architects, 7, Exchange, Bradford	April 10
Conv'ting No. 1, Frederick-st., Cardiff, into Two Shops	Messrs. Heitzman & Sons	Veal & Sant, Architects, Cardiff	April 11
Electric Wiring and Fittings at City Hall	Belfast Corporation	A. Brumwell Thomas, 5, Queen Anne's-gate, Westminster	do.
Main Drainage, etc., Works, Buncrana, co. Donegal	Inishowen R.D.C.	R. Moor, Clerk, Workhouse, Carndonagh, co. Donegal	do.
Foundations, Exten. of Elec. Power Sta., Chester-st.	Aston Manor Borough Council	G. H. Jack, Borough Engineer, Council House, Aston Manor	do.
170 ft. of 36-in. Riveted Steel Pipes	Manchester Corporation	Secretary, Waterworks Office, Town Hall, Manchester	do.
Drainage, Paving, etc., Flint-street, Clayton	do.	Paving, etc., Depart. (Surveyor's Office), Town Hall, Manchester	do.
Sewer Work, North-road, Newton Detached	do.	do.	do.
Sewering, etc., Bennet-street, etc., Ardwick	do.	do.	do.
Drainage, etc., Passage, Westmoreland-st., Harpurhey	do.	do.	do.
Draining Passage, Llanver-street, Harpurhey	do.	do.	do.
Addition to Stables, Levenshulme	U.D.C.	J. Jepson, Surveyor, Guardian-chambers, Tiviot Dale, Stockport	do.
Six Houses, Beachamp-street, Ashton-under-Lyne	.....	J. H. Burton & J. A. Percival, Archts., 150A, Stamford-st., Ashton	do.
Granite	Chelmsford Town Council	C. Brown, Borough Surveyor, 16, London-road, Chelmsford	do.
Revoe Gymnasium Apparatus	Blackpool Library Committee	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool	do.
Paving and Flagging of Streets	Leeds Corporation	City Engineer's Office, Municipal-buildings, Leeds	April 12
Free Library, Church-street, Heywood	Heywood Library Committee	North & Robin, Architects, 203, Strand, London	do.
Carting 4,000 Tons of Setts	Lancashire County Council	W. H. Schofield, A.M.Inst.C.E., County Offices, Preston	do.
Heat'g & Hot-Water Apparatus, Granelly Hill W'kh'se	Aston Guardians	C. Whitwell & Son, Architects, 23, Temple-row, Birmingham	do.
Jobbing Work (Improvements Department)	Glasgow Corporation	W. C. Menzies, 22, King-street, Glasgow	do.
Smith's Sh. & Chim. St'k, Trade-st. Pub. W'ks Depot	Cardiff Corporation	W. Harpur, M.Inst.C.E., Borough Engineer, Cardiff	do.
Convent at Tubbercurry, co. Sligo	The Marist Sisters	A. Brunty, Surveyor, St. Andrew's-cham., 1, College-st., Dublin	do.
Boys' and Girls' Gymnasia, Bulle Hill, Pendleton	Salford Corporation	Mr. Wilsher, Parks Superintendent, Peel Park, Salford	do.
Deck Bridges	Bombay, Baroda, Cen. India Ry. Co.	T. W. Wood, Gloucester House, Bishopsgate-st. Without, London	do.
Switches	do.	do.	do.
Forming Footpath with Tar Paving in Dock-road	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, Tynemouth	do.
Dust Destructor and Electricity Supply Station	Partick Town Council	Electricity Works, Mauldslie-street, Partick	do.
Slop Vans, Water Vans, and Material Carts	Willesden D.C.	Engineer to the Council, Public Offices, Dyne-rd., Kilburn, N.W.	do.
Hardwood Paving Blocks	Rochdale Corporation	Borough Surveyor, Town Hall, Rochdale	do.
Sanitary Paving Blocks	do.	do.	do.
Two Semi-detached Villas, Tavistock-rd., Launceston	Ministers of Launceston Wes. Circuit	E. Wise, Architect, Launceston	do.
New Wing, etc., to Resid. & Stabl., The Grove, Balrath	Mr. F. D. Osborne	F. Shaw, Architect, 36, South Frederick-street, Dublin	do.
Well at Power Station	Ipswich Corporation	F. Ayton, Engineer, Constantine-road, Ipswich	April 13
Stores (Electric Supply and Tramways Departments)	do.	do.	do.
10 Houses & 2 Shops, Barras-st. & Pl., Up. Wortley	.....	J. Charles & Sons, 98, Albion-street, Leeds	do.
Sixteen Cottages at Graigberthllwyd	Building Club	W. Dowdeswell, Architect, Treharris	do.
Street Watering	Hoddesdon U.D.C.	R. Lindon, Surveyor, High-street, Hoddesdon	do.
Water Meters	do.	Secretary, Waterworks Office, Town Hall, Manchester	do.
Drainage Works, Lunatic Dept., Workho. (new bdgs.)	South Dublin Guardians	J. P. Condon, Clerk, James's-street, Dublin	do.
Two Platforms, Victoria-square	Bradford Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford	do.
*Repairs at Relief Station, Stockwell-road	Lambeth Guardians	Guardians' Board Rooms & Offices, Brook-st., Kennington-rd., S.E.	do.
*Repairs at Norwood Schools	do.	do.	do.
Road Materials	Gravesend Borough Council	F. T. Grant, Borough Surveyor, Town Hall, Gravesend	April 14
Road Works and Sewer to Hospital Site	Northwich, etc., Hospital Committee	J. Cawley, Architect, Northwich	do.
Small Mortuary at Victoria Hospital, Richmond	.....	Clark & Moscrop, Architects, Darlington	do.
Materials (Sewage Department)	Glasgow Corporation	T. Melvin, Sewage Works, Swanston-street, Glasgow	do.
Second Half of Electricity Generating Station	Stepney Borough Council	M. W. Jameson, Engineer, 15, Great Alie-street, Whitechapel	do.
Eight Miles of Cast-Iron Pipes, etc.	Thurso Town Council	D. J. Reid, C.E., Inverness	do.
3,000 Tons of Guernsey Granite	Poole Borough Council	J. Elford, Borough Surveyor, Poole	do.
Stores	Epsom U.D.C.	Surveyor's Office, Bromley Hurst, Church-street, Epsom	April 15
Artisans' Dwellings at Sallynogging	Kingstown U.D.C.	Town Clerk, Town Hall, Kingstown, Ireland	do.
Artisans' Dwellings at Cross-avenue, South	do.	do.	do.
Mission Hall, Bird's Royd, Brighouse	.....	A. G. Dalzell, Architect, 15, Commercial-street, Halifax	do.
Exhast Steam Grease Separators	Belfast Gas and Electric Committee	V. A. H. M'Cowen, City Electrical Engineer, Belfast	do.
Auxiliary Feed-water Heater	do.	do.	do.
Repairing Enbankment on South Side of Clyde	Glasgow Corporation	A. B. M'Donald, City Engineer, Glasgow	do.
South African War Monument, Earlestown	Newton-in-Makerfield W.F. Com'tee.	C. Cole, Honorary Secretary, Town Hall, Earlestown	April 16
Taking Down, Rebuilding part Ousebridge Inn, York	S. Smith	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Road Material	Hunslet R.D.C.	W. B. Pindar, Clerk, Glasshouse-street, Hunslet	do.
Team Labour for Year	Neston and Parkgate U.D.C.	Surveyor, Town Hall, Neston	do.
Broken Stone and Chippings	do.	do.	do.
Laying Fireclay Pipes from Raith Gate	R. C. Munro-Ferguson	W. D. Sang & Lockhart, C.E., Kirkcaldy	do.
Materials	Wing R.D.C.	M. G. Gurney, Surveyor, Leighton Buzzard	do.
Granite	Reigate Borough Council	Borough Surveyor, Municipal-buildings, Reigate	do.
Alterations and Additions to Schools at Glentham	Lindsey County Council Educa. Com.	Scorer & Gamble, Architects, Bank-street-chambers, Lincoln	do.
Shed (336 ft. by 120 ft.) at Cattle Depot	Dundee Harbour Trustees	J. Thompson, Harbour Engineer, Dundee	April 18
*Swedish Yellow Deal Creosoted Paving Blocks	St. Marylebone Borough Council	Borough Surveyor, Town Hall, Marylebone-lane, W.	do.
Road and Footpath Materials	Hoyland Nether U.D.C.	W. P. Young, Surveyor, Town Hall, Hoyland, near Barnsley	do.
Buildings for Electricity Supply & Refuse Destructor	Todmorden Corporation	Electrical Engineer's Office, Todmorden	do.
Chimney	do.	do.	do.
Steel Roof Trusses	do.	do.	do.
Special (Permanent Way) Track Work	Manchester Corporation	J. M. M'Elroy, Tramways Department, 55, Piccadilly, Manchester	do.
Permanent Way Points, Tongues, etc.	do.	do.	do.
Sewage Pumping Machinery	Waltham Holy Cross U.D.C.	W. T. Streather, Eng. to Council, High Bridge-st., Waltham Abbey	do.
Barn, Nevie, Glenlivet	.....	Gordon-Richmond Estate Offices, Drumin, Glenlivet	do.
Additions, etc., to Steading, at Ballenleish, Strathaven	.....	do.	do.
Repairs to Barn and Stable, Croughly, Strathaven	.....	do.	do.
Repairs to Stable, etc., at Campdalemore, Strathaven	.....	do.	do.
Repairs to Dwelling House at Milton, Cabrach	.....	do.	do.
Repairs to Byre and Cattle Sheds at Achgourish	.....	do.	do.
Excavation and Pipe Laying	Hipperholme U.D.C.	G. W. Thompson, Surveyor, Council Offices, Hipperholme	do.
*Timber, etc., at Foleshill Works, for Two Acid Chrs.	Coventry Corporation	Engineer and General Manager, Gas Works, Coventry	do.
Gasholder, etc.	East Dereham U.D.C.	H. Kitson, Gas Manager, East Dereham	do.
Engine-house and Boiler-house at Burdon Pump. Stn.	Sunderland, &c., Water Company	T. & C. Hawksley, Engineers, 30, Gt. George-st., Westminster, S.W.	April 19
Alterations to Water Supply at Workhouse	Cannock Guardians	Willcox & Raikes, Eng., Union-chambers, 63, Temple-row, Bir'ham	do.
Making-up Stanley-road	Carshalton U.D.C.	W. W. Gale, Surveyor to Council, Carshalton	do.
Rest'n. Nave & Aisle, Northorpe Ch., nr Kirt'n Lindsey	.....	C. Hodgson Fowler, F.S.A., The College, Durham	do.
Bandstand, Downhills Park, Tottenham	U.D.C.	E. Crowne, Clerk, Tottenham	do.
Materials	Chadderton U.D.C.	Surveyor, Town Hall, Chadderton	do.
Team Labour	do.	do.	do.
*Making-up Hendrick's-terrace	Tottenham U.D.C.	Engineer to the Council, 712, High-road, Tottenham, N.	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Painting, etc., of Workhouse Hospital, Arclid	Congleton Guardians	The Master at the Workhouse	April 20
Cottage at Dalvey Offices		P. Fulton, Architect, Forres	do.
Flints	Tendring R.D.C.	J. Bell, Highway Surveyor, Weeley, Colchester	do.
Stables, Fire Brigade Station, etc., New Tredegar	Bedwellty U.D.C.	M. J. H. Lewis, Surveyor, Blackwood, Mon.	do.
Alterations on Dennistown Depot	Glasgow Corporation	J. Young, 102, Renfield-street, Glasgow	do.
*Paving Works	Hammersmith Borough Council	Borough Surveyor, Town Hall, Hammersmith	do.
Iron Timber-framed Hospital for Twenty-four Beds	Bilston U.D.C.	J. P. Wakeford, Engineer and Surveyor, Town Hall, Bilston	April 21
Thirty Cottages, St. George's-road, Gillingham		E. J. Hammond, Architect & Surveyor, 21, Balmoral-rd., Gillingham	do.
*Coastguard Signal Sta., etc., Seaham Harb., Durham	Admiralty	Works Dept., Admiralty Office, 21, Northumberland-avenue, W.C.	April 22
20,000 Tons of Road Metal	Bradford Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford	April 23
*Additions to Union Workhouse	Ludlow Union	W. W. Robinson, Architect, 10, King-street, Hereford	do.
Road Materials	Tenterden Town Council	W. L. C. Turner, Borough Surveyor, Town Hall, Tenterden	do.
Railway Sleeper Blocks	N. E. Railway Co.	E. H. Clark, Stores Superintendent, Gateshead	do.
Fence Posts and Rails	do.	do.	do.
Additions to School Buildings, Llandaff	Governors, Howell's Glam. Co. Sch.	J. E. Halliday, F.R.I.B.A., 14, High-street, Cardiff	do.
Lowering rd. nr. Old Whiterose Stables, New Tredegar	Bedwellty U.D.C.	M. J. H. Lewis, Surveyor, Blackwood, Mon.	do.
Painting and Renovating Chapel and Schoolroom	Faldingworth Wes. Chapel Trustees	G. Stamp, Faldingworth	April 25
Stores	Madras Railway Company	W. H. Cole, 61, New Broad-street, London, E.C.	do.
*Additions and Alterations to Workhouse, Ottershaw	Chertsey Union	Clerk to the Guardians, 80, Guildford-street, Chertsey	do.
*New Bridge at Stanwell-hill	County Council of Middlesex	County Engineer, Middlesex, Guildhall, Westminster, S.W.	do.
Branch Store & Dwelling Hse, etc., Thornton, Bradf'd	Queensbury Industrial Society	M. Hall, Architect, 1, Harrison-road, Halifax	April 26
Arched Bridge over the River Wharfe at Ilkley	Wharfedale (Ilkley) Estate Co., Ltd.	J. B. Fraser, 8, Park-square, Leeds	do.
Additions and Alterations to Herefordshire Gen. Hos.	Board of Management	Nicholson & Hartree, Architects, Hereford	April 27
Widening part of Railway, Gateshead	N.E. Railway Company	C. A. Harrison, Central Station, Newcastle-on-Tyne	do.
Storage Reservoir, near Canal-road	Bradford Corporation	J. Watson, M.Inst.C.E., Waterworks Engineer, Town Hall, Bradford	April 28
Retaining Wall to Divert Bradford Beck	do.	do.	do.
Intercepting Sewer, Dorset-road	Bexhill Corporation	G. Ball, Borough Surveyor, Town Hall, Bexhill	do.
Road Improvement Works	Luton Town Council	Borough Surveyor, Town Hall, Luton	do.
School, Blaenclydach	Rhondda U.D.C.	J. Rees, Architect, Hillside Cottage, Pentre	April 29
Well at Flamborough, Yorks.	Bridlington R.D.C.	Elliott & Brown, Engrs., Burton-bldgs., Parliament-st., Nott'ham	do.
*Coastguard Station at Robin Hood's Bay, Yorkshire	Admiralty	Works Department, Admiralty, 21, Northumberland-avenue, W.C.	do.
*Coastguard Station at Whitby, Yorkshire	do.	do.	do.
*Painting, Glass Roof Shelter, Granite Paving, etc.	Kingston Union	W. H. Hope, C.E., Seymour-road, Hampton Wick	May 2
*Alterations at Langley House, East India Dock-road	Poplar Union	J. & W. Clarkson, 136, High-street, Poplar, E.	May 6
Warming & Hot-water Sup. of New Workhse, Wesham	Fylde Guardians	Haywood & Harrison, Architects, Accrington	May 9
*New Town Hall and Fire Brigade Station	Sutton Coldfield Corporation	Borough Surveyor, Council House, Sutton Coldfield	May 16
*Heating Town Hall, Police Court, etc.	Folkestone Corporation	Reginald Pope, Architect, Folkestone	No date.
Two Shops in Carmel-street, Abertillery	Dr. Clifford Price	E. Price, Chemist, Abertillery	do.
Nine Houses, Bowling Hall-road, Bradford		A. Collinson, Builder on the Works	do.
Residence at The Barton, Hereford	H. Evans	Groome & Bettington, Architects, Palace-chambers, Hereford	do.
Prim. Methodist Sunday Sch's & Institute, Walkley		W. J. Taylor, Architect, 39, Bank-street, Sheffield	do.
Furniture to Hospital	Glasgow Parish Council	J. R. Motion, 266, George-street, Glasgow	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Architectural Assistant	City of Birmingham	3*l.* per week	April 12
*Building Inspector	City of Sheffield	120*l.*	April 15
*Architectural Assistant and County Surveyor	County of Southampton	250*l.*	April 16
*Foreman of Works	Gold Coast Government	300*l.* per annum	April 19

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, *Contracts*, iv. vi. viii. x. xii. *Public Appointments*, xvi

TENDERS—*Continued from page* 339.

GOSPORT. — For extensions to mineral water factory, for Messrs. Mumby & Co.' Mr. W. H. Fry, A.M.I.C.E., architect, Gosport. Quantities by the architect :—

R. W. Lowe	£2,188	C. M. Dash	£1,889
F. Corke	2,093	H. Jones, Portsmouth*	1,883
J. Croad	1,990		
J. Crockerill	1,931		

HALE (Cheshire).—For new drainage works, for the Urban District Council. Mr. F. J. Lobley, Engineer, Hale :—

G. Bozson	£707 10 0	W. Watson	£648 12 0
F. Hamilton & Son	688 0 0	Wellerman Bros.	618 1 6
Naylor & Sons	678 11 9	S. Hutton, Bowdon*	569 0 4

HELENSBURGH.—For formation and repair of footpaths, for the Town Council. Mr. J. R. Wilson, C.E., Burgh Surveyor, Helensburgh :—

A. Lindsay, East King-street, Helensburgh*.
[Amount of contract about £2,000.]

IVYBRIDGE.—For 650 tons of broken stone, for the Urban District Council. Mr. W. R. Parker, Surveyor, Ivybridge :—

	s.	d.		
J. Harvey Dickson	6	1	per ton	Delivered
Coker	5	6	,, ,,	
Lapthorn	5	3	,, ,,	
Kent	5	6	,, ,,	
Phillips, Ivybridge*	4	8	per yd. cubic (at quarries).	

LEICESTER. — For extension of machine shop (builder's work only), for Messrs. Taylor & Hubbard, crane makers. Messrs. Tait & Herbert, architects, Leicester and Coventry :—

Hardington & Elliot	£1,239	Dyers & Yates	£1,150
J. E. Johnson & Son	1,236	J. O. Tewsbury	1,085
Freer	1,190	Bowles & Son	1,065
		F. Elliot*	1,050

[All of Leicester.]

LICHFIELD.—For erecting fourteen workmen's dwellings in Upper-street, John-street, for the Sanitary Committee of the City Council. Mr. Emerson Brooke, City Surveyor, Lichfield :—

J. R. Deacon, Lichfield £3,258 9
[Ten tenders received.]

LONDON.—For the erection of a wall at Prince's-road Workhouse, for the Lambeth Guardians :—

		Time of Completion. Months.
Good & Sons	£385 0 0	2
T. Simmonds	373 0 0	2
A. Aldridge	366 4 8	3
C. Blyton & Sons	360 0 0	2
H. Kent	349 0 0	2
H. Bragg & Sons	347 0 0	2
G. Newton	337 0 0	2
London & County Builders, 29, Alma-road, Wandsworth, S.W.*	336 8 0	2

LONDON. — For addition and alterations to business premises, Nos. 26 and 28, Kirkdale, Sydenham, for Messrs. Sydney Smith & Sons, Ltd. Mr. George Pratt, architect and surveyor, Railway-approach, Sydenham :—

J. Pratt	£1,025 0 0	H. Covey & Co.	£879 15 0
S. R. Best	899 5 0	J. M. Stewart*	799 0 0

LONDON.—For the erection of detached residence in Dollis-avenue, Church End, Finchley, N., for Mr. G. H. Ohlson. Messrs. Bennett & Richardson, architects, The Broadway, Church End, Finchley, N. :—

C. F. Day	£1,100	C. W. Scott	£1,010
Shewry & Sons	1,025	J. Phœnix*	990

LONDON.—For electric wiring of buildings, etc., at the generating station, Bermondsey, for the Borough Council. Messrs. Kincaid, Waller, Manville, & Dawson, engineers, Westminster :—

Sunderland & Co.* £430

LONDON.—For erecting two houses, Well-street, Hackney, for Mr. John Robbins. Mr. A. S. Caughey, architect, 19, Avenue-road, Leytonstone, E. Quantities by architect :—

W. E. Westgate	£717 10	F. Gowen	£549 10
H. Wood	615 0	E. Saunders	546 10
T. B. Campion	596 0	Welbking & Co.	540 0
R. Woollston & Co.	580 0	James Abbott, Walthamstow	490 0
S. Kirch	550 0		

MARKET HARBOROUGH.—For an iron and wood hospital, in two wards of two beds each, with central duty room and lobby, for the Urban District Council :—

G. Jarman & Sons, Little Bowden* £115

NECHELLS (Birmingham).—For the construction of electric power transmission scheme buildings, for the Birmingham Tame and Rea District Drainage Board and the Corporation for the City of Birmingham. Mr. J. D. Watson, Engineer to the Board :—

	Buildings.			Furnace Chimney.					
	£	s.	d.	£	s.	d.	£	s.	d.
J. A. Meredith	19,819	5	8	1,471	11	5	21,290	17	1
Wilkins & Sons	18,746	0	0	1,747	0	0	20,493	0	0
E. Garfield	18,210	0	0	1,630	0	0	19,840	0	0
G. Jackson	17,635	10	3	1,478	17	4	19,154	7	7
W. Wistance	17,433	0	0	1,516	0	0	18,949	0	0
C. Bryant	17,093	0	0	1,404	0	0	18,497	0	0
Costain & Sons	17,122	0	0	1,252	0	0	18,374	0	0
Whitehouse & Sons	16,595	0	0	1,362	0	0	17,957	0	0
G. Webb	16,630	0	0	1,239	0	0	17,869	0	0
I. Langley	16,195	3	8	1,486	19	1	17,682	1	9
W. H. James	15,839	0	0	1,435	0	0	17,274	0	0
W. & J. Webb	15,733	0	0	1,425	0	0	17,158	0	0
W. Hopkins	15,400	0	0	1,494	0	0	16,894	0	0
Haycock & Sons	15,361	0	0	1,490	0	0	16,851	0	0
H. Dorse	15,103	19	9	1,250	0	0	16,353	19	9
Lowe & Sons	14,887	0	0	1,223	0	0	16,110	0	0
Barnsley & Sons	14,886	0	0	1,196	0	0	16,084	0	0
Hodson & Sons	14,906	19	9	1,136	19	5	16,043	19	2
Dallow & Sons	14,850	0	0	1,025	0	0	15,875	0	0
T. Johnson	14,409	0	0	1,247	0	0	15,656	0	0
Lee & Sons, Birm'gham*	14,466	0	0	1,149	0	0	15,615	0	0
Alphons Custodis Co.	—			1,297	0	0	—		
Universal Engineering Co.	—			1,057	0	0	—		

PAISLEY.—For street works (Camphill, Lacy, New Stock, and Walker streets), for the Town Council. Mr. James Lee, C.E., Borough Surveyor, Paisley. Quantities by Engineer :—

Camphill-street.
A. A. R. Lang, Contractor, Gourock, N.B.* £533 15 10
Lacy-street.
A. A. R. Lang, Contractor, Gourock, N.B.* 981 9 6
Walker-street.
A. A. R. Lang, Contractor, Gourock, N.B.* 790 19 6
New Stock-street.
Greig Bros. & Co., 163, Hope-street, Glasgow* 471 0 6

PAISLEY.—For brick culvert, etc., covering of Ladyburn, for the Town Council. Mr. James Lee, C.E., 13, Gilmour-street, Paisley. Quantities by Engineer :—
A. Stark & Sons, 142, West Nile-st., Glasgow* £503 6 3

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PORTSMOUTH.—For alterations and additions to the Empire Palace of Varieties (first section). Mr. W. H. Fry, A.M.I.C.E., Gosport, architect. Quantities by the architect :—

W. Ward ..	£1,290 0 0	S. Salter	£1,149 0 0
Light & Son.	1,233 0 0	J. Crockerill ..	1,145 0 0
Croad & Son .	1,210 0 10	H. Jones	1,097 0 0
Clark & Son .	1,195 0 0	M. Coltherup .	1,075 0 0
Tubb & Son .	1,150 0 0	F. Corke*	1,048 0 0

[All of Portsmouth.]

PORTADOWN (Ireland).—For the first section of waterworks (twenty-four miles of pipes and two service reservoirs), for the Portadown and Banbridge Joint Board. Messrs. R. H. Dorman & J. H. H. Swiney, engineers, Armagh and Belfast. Quantities by engineers :—

J. Moran & Son	£64,881 11 8	M. Green ..	£42,467 0 11
R. Calhoun ..	49,068 0 0	J. Ross & Son	42,218 1 6
Courtney & Co.	46,970 0 0	Whyte & Co.	42,154 1 7
J. Kelly	46,305 1 4	J. Graham ..	39,782 3 2
H. & J. Martin, Ltd...	45,197 0 0	McKee & McNally..	38,021 7 2
Wright & Son	45,172 5 3	R. C. Brebner	37,344 10 6
J. G. White & Co.	44,362 13 10	Collen Bros., Ltd., Portadown* ..	36,000 0 0
Heggarty & Gault	43,849 0 0		

REIGATE.—For alterations and decorations to Sandfels, South Park, Reigate, for Mr. P. C. Mordan. Mr. C. E. Salmon, architect, Bell-street, Reigate :—

H. Guy	£164 11
T. Nightingale*	£156

SANDAL.—For drainage works in streets off Agbrigg-road, Sandal, near Wakefield, for the Urban District Council. Mr. F. Massie, Tetley House, Wakefield. Quantities by Mr. F. Massie, Tetley House, Wakefield :—

A. Pawson	£249 7 2	Higgins & Pashley, Brook-st., Wakefield* ..	£183 17 3
E. Bell & Son..	243 3 0	Wright & Walling	171 19 6
H. G. Wilson ..	185 11 0		

SEATON DELAVAL.—For the erection of a miners' hall to seat about 500. Mr. J. Dobbinson, architect, Colliery-yard, Seaton Delaval, Northumberland :—

Robinson & Edwards, Seaton Sluice, Northumberland* £714 15 1

[Bricks and furnishing not included in this tender.]

ST. ANDREW'S (Scotland).—For the construction of a low-water swimming pond at the Castle Bathing Station, for the Town Council. Mr. W. Watson, Burgh Surveyor. Quantities by Burgh Surveyor :—

Darrie Bros...	£509 12 0	H. Ritchie & Son	£321 17 1
W. Braud & Son	508 19 1	T. S. Dicks, Broty Ferry*	293 7 1

STANLEY.—For street works, for the Urban District Council. Mr. J. Routledge, Surveyor, Council Offices, Stanley. Quantities by Surveyor :—

R. Gardner....	£491 15 10	G. E. Simpson, Newcastle*..	£365 14 10
A. Routledge ..	383 11 10		
T. Johnson....	381 13 0		

SOUTHAMPTON.—For additional pavilion at Isolation Hospital, Mousehole, for the Corporation. Mr. J. A. Crowther, Borough Engineer, Southampton. Quantities by Engineer :—

H. Stevens & Co. ..	£5,753	Jenkins & Sons, Ltd.	£5,375
Golding & Ansell ..	5,470	H. Lawrence*	4,779

[All of Southampton.]

TAMWORTH.—For the erection of a new laboratory, etc., at the Grammar School, Tamworth, for the Governors. Mr. J. W. Godderidge, architect, 4, Bolebridge-street, Tamworth :—

J. Watton & Sons	£987 15
B. Musson, Glascote	895 0
A. Clarson & Sons*	893 10

TARVES (Scotland).—For new vestry, etc., at the Parish Church, for the Kirk Session. Mr. J. Cobban, architect, Haddo House, Tarves :—

Buchan, Thom, & Smith, Tarves* £160

TERRINGTON ST. CLEMENT.—For erecting a butcher's shop, offices, etc., for the Archangel Lodge of Oddfellows. Mr. R. W. Bryant, architect, Terrington St. Clement, Lynn :—

W. Bardell	£179 0 0
H. W. Reader	172 15 0
Sleight & Morton, Terrington St. Clement*	143 2 3

TODDINGTON (Beds.).—For new steel and iron bell framing and girders, re-casting four bells, and re-hanging the peal of eight bells, with new fittings, to the parish church. Mr. W. B. Stonebridge, architect, Woburn, R.S.O., Beds. :—

J. Warner & Sons, London* £301

TURRIFF (Scotland).—For dwelling-house and farm-steading, Hill of Barnyards, for the Town Council. Messrs. James Duncan & Son, architects, Turriff :—

Mason : J. Robb*	£176 17 0
Carpenter : J. Rae & Son*	145 0 0
Slater : J. Gammack & Co.*	78 10 0
Plasterer : J. B. Dallas*	13 5 0
	£413 12 0

[All of Turriff.]

WELLINGBOROUGH.—For the erection of new cemetery chapel, porter's lodge, entrance gates, piers, and wall, for the Urban District Council. Messrs. Talbot Brown & Fisher, architects, Burystead-place, Wellingborough :—

Berrill & Green, Wellingborough £2,360

WOBURN SANDS (Beds.).—For a cottage residence, Theydon-avenue, for Mr. F. P. Chapman, Savoy Chapel, W.C. Mr. W. B. Stonebridge, architect, Woburn, R.S.O., Beds. :—

H. Gregory ..... £280 | C. Sinfield, Aspley* .. £255

WOBURN SANDS.—For two pairs of villas, Weathercock-lane, for Messrs. H. G. Fisher & Son. Mr. W. B. Stonebridge, architect, Woburn, R.S.O. :—

W. T. Sharpe	£1,615 15 0	M. Fleet	£1,402 10 0
G. Botsford..	1,460 0 0	H. Gregory, Woburn* ..	1,184 0 0
C. Sinfield ..	1,431 5 9		

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The Builder.

VOL. LXXXVI.—No. 3193. APRIL 16, 1904.

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Town Hall and Fire Station, Sutton Coldfield ..... Mr. A. R. Mayston, A.R.I.B.A., Architect.
Maynard Arms, Bagworth
Houses, Fosse-road, Leicester
Offices, St. Martin's East, Leicester } ..... Messrs. Everard and Pick, Architects.
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The Church of Orpington.

ORPINGTON had a church in early days of no small importance. Until comparatively recent times the four considerable adjacent churches of Downe, Hayes, Knockholt, and St. Mary Cray were but chapels of the mother church of Orpington. Mention is made of Orpington as early as the days of Canute; in 1032 Eadsige, one of the King's chaplains, gave his manor of Orpington to the Canterbury monastery of Christ Church at the time when he was entering that house as one of its canons. Irrespective of any possible fabric remains, it is impossible to doubt that there was at that time at least one, and probably several churches or chapels on Eadsige's large estate in Kent. At the time of the Domesday Survey there were three churches within the paramount manor of Orpington, one of them undoubtedly standing on the site of the present parish church. Of the other churches, one was certainly that of St. Mary Cray and the third was almost certainly that of Hayes, which was found to contain much Roman tile in its walls during restoration in 1862.

Considering the large area over which the church of Orpington was the mother church, and that contingents from the chapelries would be expected to attend on certain defined festivals, it is rather surprising to find that the fabric is not more imposing in size, for its interior length is only 100 ft. The population was, however, but sparse in mediæval days, and no special reason seems to have arisen for materially enlarging its original area. Estimates based upon the extant Kentish receipts of the Poll Tax in 1337 give the population of Orpington as 290, whilst the chapelries of Downe, Hayes, and Knockholt numbered respectively 167, 104, and 83.

The church of All Saints, which stands well above the long straggling village, consists of an aisleless nave, west porch, north tower—the base of which forms a transept chapel—chancel, and north chapel out of the chancel.

The fabric of the church shows work of Saxon date, considerable alterations in the XIIIth century, and several interesting developments and changes in the XIVth and XVth centuries. The walls are in the main composed of flint, slightly dressed on the outer surface, but with occasional pieces of Ashlar stone and a few fragments of Roman brick. When the church was undergoing restoration in 1873 it was possible, by the different colour of the mortar and cement, to detect three periods of construction or reconstruction in the nave walls, whilst many pieces of Roman brick or tile then came to light, as well as stones of an earlier chancel in the north chancel wall.

The interior measurement of the nave is 64½ ft. long by 22 ft. wide. This part of the church stands upon the pre-Norman foundations, and probably includes within the walls very much of the original structure of the church built here by Eadsige, or standing here when he transferred his property to Christ Church, Canterbury. Three years after Canute's wealthy chaplain had gone to Canterbury he was consecrated Bishop of St. Martin's, to act as suffragan to the aged Archbishop Ethelnoth. On Ethelnoth's death in 1037, Eadsige of Orpington became Archbishop of Canterbury; he died in 1050, but became incapacitated for any work shortly after he had crowned Edward the Confessor in 1043. At the east end of the south wall of the nave there are undoubted traces of Saxon workmanship; the old nave ended several feet nearer to the west, and the corner course of the beginning of the old chancel is also shown in long and short work. This was much more clearly demonstrated at the time of the restoration. Inside the nave, just behind the pulpit, are traces of Saxon arcade work. The style appears to be late in the period, and may quite possibly date from the time when Eadsige, the future archbishop, was leaving Orpington for Canterbury. It seems reasonable to suppose that he would leave his church in good order before transferring the estate to the great priory of the county.

Quite at the beginning of the XIIIth century, or towards the close of the XIIth, came the first alteration to the Saxon nave and chancel of Orpington, which, being well built and of good size for a country church of those days, required no alteration or rebuilding in the Norman period. The west doorway of the nave, within the porch, is a fine example of early pointed work of Transitional character. The two members of the deeply cut mouldings are respectively ornamented with the dog-tooth and bold chevron designs, and the two detached shafts in each jamb have well-cut stiff foliage in their capitals. This entrance archway has been rather clumsily repaired, but still retains much beauty of expression, though a good deal overshadowed

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by the later porch. Probably the nave was slightly extended westward when this entrance was built. The lower stage of the tower is pure Early English, with very narrow, tall, and well-splayed lancet lights yet remaining on the north and east sides, and may quite possibly be of the same date as the west entrance, for several instances are known in which work which betokened Transition from Norman was done at the same time as the purer pointed. At all events the tower was added, at the latest, quite early in the XIIIth century. The position of this tower, as an adjunct to the east end of the nave, forming a quasi-north transept, with the basement used for a side altar, is unusual, but by no means altogether unknown elsewhere. There is one of like date and position at Abbotsham, North Devon. Towers at the east end of north aisles may be noticed in Kent at Dartford, Betteshanger, and Thanington, and also at Fordingbridge in Hampshire. Generally some reason can be found for an exceptional position for a tower. At Orpington the tower could not have been on the south side because of the nearness of the old rectory house and land; and if the west end and entrance are of a somewhat earlier date than the tower, as is quite possible, there would be a natural reluctance, when a bell-tower was required, to remove or destroy such recent good work. The area within the tower is about 14 ft. square; in the north wall is a small trefoil-headed piscina niche. It may here be remarked that the original tower was probably only of two stages. At a later date a shingled top or upper stage was added. A great storm in 1771 destroyed this timber structure and so injured the upper part of the masonry that much of it had to be removed. The upper embattled stage of the low tower now shows bell-chamber windows of brick, and the buttresses have been somewhat clumsily repaired with the like material at two different dates.

It would seem that the church folk of Orpington were content to use the Saxon chancel until about the middle of the XIIIth century. In 1873 the chancel underwent a great deal of renewal, particularly on the south side and at the east end; a part, too, of the north side had been obscured by a late XVth century chapel; but sufficient remains, particularly in the single-light window of the north wall, to enable us to say that the building of a new chancel was not undertaken till the Early English style was well advanced.

The great tithes of the large parish of Orpington were of considerable value. The church was not appropriated to the Canterbury priory, but the rectory was in the gift of the Archbishop and was one of his more valuable pieces of preferment. At Orpington, until comparatively recent times, there was the abnormal arrangement of having an endowed vicarage as well as an endowed rectory, the vicar being presented by the rector. In pre-Reformation days the rectors usually resided at Orpington, in the large house close to the church, as well as the vicars; but in post-Reformation days the rectory was regarded as a sinecure and the rectors were non-resident. The first rector of Orpington whose name is known was Hugh de Mortimer, who was also Archdeacon of Canterbury and Provost of Oriel College, Oxford. He was rector of Orpington from 1254 to 1270. Hugh de Mortimer was evidently a man of considerable means, and the chancel was probably rebuilt by him about the beginning of his incumbency.

After this date the fabric of the church seems to have been left undisturbed for upwards of a century. Towards the close of the reign of Edward III. a porch was added to the west end of the nave. It is of a fair size, having an internal measurement of 13 ft. 4 in. by 10 ft. 8 in. At this time, probably, an interesting, but somewhat disfiguring, alteration was made in the fine western doorway. The inner of the two shafts of the south jamb was cut away in the centre to admit of the intrusion of a holy-water stoup. This stoup remains fairly perfect up to the present day.

One of the special features of Orpington church is the canopied tomb in this porch. Interment in the porch or at the doorstep of the chief entrance was not infrequently prayed for in mediæval wills in token of humility, the testators sometimes specially stating that they desired to be beneath the feet of all hereafter entering God's House. Occasionally a coffin slab with incised cross or nearly erased inscription remains in its original position at the threshold, but actual mural monuments or any form of upstanding memorials within the porch are most exceptional. Nicholas, rector of Orpington, by will dated August 1, 1370, desired that he might be buried within the porch that he himself had recently erected. The tomb occupies most of the north side of the porch; the low placed slab of Bethersden marble has long ago lost any inscription or cross in low relief that it may have borne, but the beautiful crocketed canopy, of ogee shape, with a good finial and traceried cuspings carved in white chalk, is fairly perfect. Rector Nicholas, by his will, directed that his executors should duly provide for the celebration of masses for his soul and for the soul of Archbishop Stratford, his friend and patron. To his successor in the rectory he left his great breviary, noted after the Sarum use, and also his new ordinal, on condition that the next rector should not receive anything for dilapidations in respect of the five houses of the benefice that he had put in order. This entry points to residences for priests, not only at Orpington, but at each of the four parochial chapelries.

Nicholas's successor in the rectory was John Wodehull, who died in 1382. By his will he left 40s. to the work of Orpington church; but such bequests are fairly continuous in the majority of pre-Reformation wills, and do not necessarily imply that any important alterations were in progress. Bequests of this character usually only mean that a sum was given to the general fabric fund, which was used for any ordinary repair to roof, windows, battlements, etc.

At the very beginning of the XVth century a man of considerable eminence both in Church and State was rector of Orpington. John Wakering was rector for some years, exchanging Orpington for the rectory of Barton Turf, Norfolk, in 1407. Wakering was Master of the Rolls in 1404, Archdeacon of Canterbury in 1408, Canon of Wells in 1409, and from 1410 to 1412 joined with Sir Thomas Beaufort in the office of Keeper of the Great Seal. In 1416 he was consecrated Bishop of Norwich, and died in 1426. Whilst he held that see he built the Chapter House, and began the new Cloister of Norwich. Important and well-executed alterations at Orpington church were effected *circa* 1400, about the beginning of the Perpendicular period. These may, with much probability, be assigned to Rector Wakering. On each side of the nave are two good pointed two-light windows of that period, somewhat high up in the walls. Growth in the art of glass painting and greater appreciation of its suitability for church decoration were rife about this period, and probably brought about the insertion of these enlarged windows in the nave. To the same date belongs the blocked-up doorway on the north side of the nave, with its good but simple mouldings.

In 1475 Thomas Wilkinson was collated to this rectory by Archbishop Chicheley. He was a pluralist, holding at the same time the rectory of Harrow-on-the-Hill, and a prebendal stall at Ripon. He seems, however, to have resided throughout at Orpington. After holding the rectory for thirty-six years, he was buried here in 1511, and his fine brass is in the chancel. During the time of Wilkinson's incumbency there were various alterations in this church. The most important was the building of a chapel on the north side of the chancel, which was probably of a chantry character. This chapel, which has an interior measurement of 15 ft. by 10 ft. 10 in., and now holds the organ, was built on to the east side of the tower and the north side of the chancel, with arches into both tower and chancel. Against the east wall are two well-carved image brackets, one bearing the arms of Rufford—a chevron between three trefoils slipped—and the other, Rufford impaling a bend on a chief two mullets pierced. This latter coat was borne by the families of George, St. John, and Salway; we have failed to identify the particular Rufford who was the builder of this chapel, or the alliance that he made. The Rufford arms are repeated in stone on several shields about the archway into the chancel. In the north wall is a wide-arched four-light Tudor window; amid the tracery on the outside there is twice carved in the stone a slipped trefoil. Work that was executed elsewhere in the church at the same time that this chapel was built, or thereabouts, may be noticed in the priests' door on the south side of the chancel; in a three-light window high up on the south side of the nave, near the east end; and in the three-light west window over the porch. The round window high up in the west gable was an inappropriate insertion of the 1873 restoration. As to the chapel, a branch of the Rufford family had property at Crofton, a hamlet in this parish. There was a hamlet chapel of their foundation at Crofton, which served as a chapel of ease; but it was destroyed under the confiscating Chantry Act of Edward VI., although it was pleaded that the inhabitants were two miles from their parish and were often separated from it by flood water in the winter months.

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Within the church, at the west end, is a good octagon XIIIth century font supported on a central shaft and four auxiliary ones; there is a coved font cover, terminating in a finial and drawn up by a pulley, which is apparently of late XVth century date.

In the south wall of the nave, close to the east end, are two small XVth century doorways, one on the ground and one about 5 ft. from the floor. The late Canon Scott Robertson, in a short article on this church, which he contributed to *Archæologia Cantiana* in 1880, thought that this latter doorway was too low for giving access to a rood loft, and conjectured that it led to a mural pulpit. There can be no doubt, we think, that both these doorways were connected with the rood loft stairs, and that there were further wooden steps from the upper one; but Canon Robertson may have been partly right in his surmise, for a lower side stage of the rood loft may have served for what we now understand as a pulpit, of which arrangement there is a Norfolk instance.

In the chancel there is a large aumbry with rounded head in both south and north walls near the altar; and there is also a small sedilia recess in the south wall, with a like head, but this seems to be an 1873 insertion. The low north vestry of the chancel, to the east of the north chapel, is modern; but, as the doorway out of the chancel is old, there probably was a vestry or sacristy here in mediæval days. In Thorpe's *Registrum Roffense*, published in 1769, there is a detailed account of the monuments in this church, most of which are still extant. The three oldest are brasses. On a gravestone in the chancel is a brass plate inscribed to the memory of William Gulby, Esq., who died in 1439, with an escutcheon of his arms—a chevron between three cross molines. In the centre of the chancel there used to lie the effigy and inscription of Thomas Wilkinson, rector of Orpington, who died in 1511. This fine brass has now been removed to the north wall for purposes of preservation; the effigy, which is 3 ft. 2 in. long, represents the rector in cope, almuce, surplice, and albe. The third brass bears the small effigy and inscription of "Mr. John Gover, bacheler of bothe lawes and vicar of this church," who died in 1522.

Several of the monuments have reference to the residence in this parish, at the old rectory or parsonage (which has since obtained the confusing and erroneous title of "Priory"), of the Hon. Richard Spencer, second son of Robert, first Baron Spencer of Wormleighton. He was born in 1593, and married a Kentish bride—Mary, daughter of Sir Edwin Sandys, of Northbourne. His wife's brother was an enthusiastic Roundhead, whilst Colonel Spencer, who raised a great sum of money for the King and two regiments of horse, was an equally enthusiastic Royalist. Ledger stones commemorate his death in 1661 and that of his widow in 1675. On the south side of the chancel is a monument to his fourth son, Richard, who died at the age of nine; the following is the epitaph:—

"Here lyes the blessed boy
His mother's jewell, father's joy,
The noble Spencer's bud, at nine,
An age of yeares in this youth's time:
Sweete blossome, blown for cutting down,
With fragrant dust to forme a crown."

His other sons, who died in their infancy, are buried elsewhere, but on ledger stones within the altar rails are inscriptions to his two married daughters and co-heiresses, Margaret Venables, 1676, and Mary Gee, 1702. Outside the rails are two other ledger stones commemorating Richard Gee, 1727, and his widow, Philippa, 1744.

It is curious to note that all the burials at Orpington are on the north side of the church. Only a few feet intervene between the south side of the church and the boundary wall of the old rectory. There are two well-grown yew trees on the north side.

NOTES.

Is London Bridge Safe? AN alarmist paragraph under this heading has recently been published in some of the daily papers, but absolutely nothing is stated in justification of so reckless and mischievous a suggestion. The vague assertion is certainly made that since the widening of the footpaths an "extraordinary vibration, which did not exist previous to the alteration," is noticed by those who keep close to the balustrade, and it is added that "so great is the trembling resulting from vehicular traffic that every morning the gas mantles used in connexion with the incandescent lighting of the bridge have to be renewed." Truly the penny-a-liner must exercise great influence in the editorial offices of a paper that publishes such palpable nonsense as this. In the first place, it is quite impossible for foot-passengers to make any accurate comparison between the previous and the present vibration caused by traffic, unless aided by records furnished by correctly calibrated instruments. It is perfectly absurd to judge the present vibration by the faded memory of long-past mental impressions, and a little inquiry would have exploded the fallacy of the gas-mantle theory of vibration. We are perfectly familiar with the constructional details of the widening, and these are quite sufficient to show that the widened footpaths are quite solid and safe. But we have taken the trouble to make further investigation, and have learnt on good authority that the vibration on the footpaths is actually less than that on the cutwaters of the bridge piers. With regard to the incandescent mantles, it is certainly the fact that these have been breaking. This is due, however, simply to the fact that the lamp standards first employed were entirely of temporary character, and so were not fitted with anti-vibrators, such as are generally necessary in thoroughfares where there is heavy traffic. The permanent system of lighting will include anti-vibrators, and it is considered certain that no further breakages will occur. It is much to be regretted that certain daily papers persist in making themselves ridiculous by repeating fallacious rumours of this kind.

Reinforced Concrete in the Baltimore Fire. A USEFUL exemplification of the fire-resisting qualities of concrete-steel is afforded by the United States Fidelity and Guarantee Building, which was exposed to a very high temperature in the Baltimore fire. This building is about 78 ft. high, and the concrete construction comprised the whole interior, and consisted of six platforms supported on columns. It was built about a year ago to replace the former timber interior, and left the brick walls standing at the rear and on two sides of the building. The front was composed chiefly of cast iron and plate glass. The floor surfaces, doors, window-frames, and partitions were of wood. All these combustible materials, together with the furniture, were entirely consumed in the fire, and the upper two stories of one of the brick walls fell; while the remainder of the brickwork was so damaged that it had to be taken down. It is interesting to note that the concrete construction was practically uninjured; in fact, the cantilever extensions of the floors in front and rear remained intact, and the attic floor carried a tier of columns reaching to the roof which it had never been designed to support. Although the floor slabs showed slight cracks, they were neither broken nor disabled. This building was the only one in the block which escaped destruction, and its endurance is a sufficiently satisfactory proof of the fire-resisting properties of concrete-steel.

Roval Commission on Coal Supplies. THE work of this Commission appears to proceed slowly, because the inquiry into the extent and probable duration of the coal supplies of the United Kingdom is a very wide subject. A large amount of work has been accomplished, however, and from a recently published interim report we learn that the witnesses examined during the period covered have dealt chiefly with possible economies and improvements in connexion with the working, preparation, transport, and use of coal, as well as with the possibility of substituting other kinds of fuel, and of adopting power derived from other sources. The great possibilities of economy suggested by the witnesses make it desirable that their evidence should be carefully studied by the Commission in the interests of the nation as a whole. It is stated that local investigations into the available resources of the known coalfields are rapidly approaching completion, and it is hoped that the reports of all the District Commissioners will be received by the end of June next. Satisfactory progress has also been made with investigations into the available resources of concealed coalfields, a matter which, involving geological problems of supreme importance, will necessarily occupy a considerable amount of time. While no definite recommendations can be expected for the present, the work of this most important Commission is evidently proceeding in a satisfactory manner, and every possible care is being taken to avoid undue delay.

An Important Discovery. AS THE result of experiments with thorium oxide, Professor Baskerville, of the University of North Carolina, has succeeded in separating two hitherto unknown substances possessing distinctive

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specific gravities and atomic weights. The first of these is a greenish powder, which has been named Berzilium, as the element was first observed by Berzilius in the form of vapour, but without identification; and the second is a pinkish powder, which has been named Carolinium, after the State in which it was discovered. The chief interest of these new elements is to be found in the fact that they are radio-active and self-luminous substances. From demonstrations made at the Chemists' Club, U.S.A., it is evident that their luminous and penetrative properties are very considerable, as samples of Berzilium and Carolinium gave forth a very perceptible glow when enclosed in cloth-covered tubes of copper, brass, rubber, iron, and glass. It seems likely that these substances will be of commercial value in connexion with illumination, but of course it is too early to predict the precise direction in which they will be found most serviceable. The next matter for inquiry is whether sources of the new elements can be found in countries other than the United States. As monazite, the mineral from which they were indirectly derived, is to be found in the Ural Mountains in Swaziland, and elsewhere, as well as in America, an interesting field for investigation is open to European scientists.

Losses in Electric Cables.

THE paper by Mr. M. B. Field, on the "Losses in Electric Cables," which was read to the Institution of Electrical Engineers this week, will be of great interest to the rapidly-increasing number of engineers in this country who have to distribute electric power over long distances. At the present time several hundreds of miles of high-tension three-phase cables are being put underground in London in connexion with the Underground Railways of London, Ltd., the Metropolitan Railways, and the Metropolitan Tramways. These cables contain three copper conductors inside a lead sheath, which is heavily armoured with galvanised iron wire. This armouring serves not only as a mechanical protection but also as an efficient "earthing" sheath, preventing any part of the sheath from attaining a dangerous potential. When the cable is not armoured, the Board of Trade insist that a copper sheath be made inside the lead sheath and connected with earth so as to prevent the former ever becoming dangerous. Mr. Field in his paper points out that the eddy currents induced in this copper shield are appreciable, and thus a considerable percentage of the power generated at the station is expended uselessly in heating this copper sheath. He deduces his results from theoretical considerations, and, as he has to introduce many assumptions in order to arrive at working formulæ, the accuracy of the latter is open to doubt. The pictures he gives of the magnetic fields round cables are very instructive. In some cases, however, the lines of force pass from air into copper conductors carrying currents without undergoing any apparent refraction. Whilst we agree with the author in thinking that the losses in the Board of Trade earth shield, and perhaps even in the lead sheath, are appreciable, we think that the losses in the conductors themselves due to eddy currents are much more important.

John Stow's Monument.

THE Merchant Tailors' Company are about to repair Stow's monument in the Church of St. Andrew Undershaft, Leadenhall-street. The monument, set up by his widow Elizabeth, represents the historian and chronicler of London as seated, with a writing-desk upon his knees, in a rectangular recess resting upon a base of white marble and surmounted with the carved coat-arms of the Company. The figure, which has every appearance of being an authentic effigy, was formerly coloured. It is often described as being of terra-cotta, but is for the most part composed of veined alabaster with black marble inserted in the frieze. The design of the composition is so similar to that of the contemporary monuments (illustrated in the *Builder* of September 25, 1886) of Richard Humble and John Trehearne in St. Saviour's, Southwark, that the three would seem to be by the same sculptor's hand. Maitland records that Stow's remains were disturbed in 1732, and, it is said, removed for the interment of some one else. Stow died, aged 80, poor and neglected, on April 5, 1605, and was buried close by his later home near the well, since known as the pump, within Aldgate. A tailor by trade, he was a freeman, as were his father and grandfather, of the Merchant Tailors' Company. In his old age he received from James I. a licence to beg and to accept alms. Three hundred years ago he brought out the first edition —the copies are dated 1598 and 1599— of his Survey of London, in a quarto volume of 483 pages printed in black letter, with an appendix, descriptive of London and then printed for the first time, written in Latin by William Fitzstephen, the monk of Canterbury and chaplain of Archbishop Thomas à Becket. In 1560 he edited Chaucer's poems, and in 1561 published the first annual volume of his Summary of the Chronicles of England. In 1580 appeared the first edition of his "Annales." A second edition, enlarged to 579 pages quarto, of the Survey was issued in 1603; meanwhile he republished the "Flores Historiarum" and Matthew Paris's and other Chronicles, 1567-87. The sixty MS. volumes, collected for the Chronicles of England and preserved in the British Museum, testify to his amazing industry and perseverance, exerted under most adverse circumstances and with much more profit to his successors than to himself.

Junior Army and Navy Club, St. James's-Street.

IN the course of next month will be offered for sale at the Mart the premises vacated by this Club which stand at the corner, south, of St. James's-street and King-street. The clubhouse, which has frontages of about 154 ft. to the latter street and of 48 ft. to St. James's-street, is held upon a direct lease from the Crown for an unexpired term of fifty-three years. The house was built in 1832, after designs by Sir James Pennethorne, as the St. James's Bazaar, comprising a grand saloon measuring 100 ft. by 40 ft., for John Crockford, who kept the gaming-house at the north end of the street. In 1882-3 the late Wyatt Papworth adapted the house for the occupation of the Junior Army and Navy Club. Papworth added a curb-roof to the return front in King-street, remodelled the interior, and added bay-windows to the front in St. James's-street.

The New English Art Club.

SOME of the best things in the present exhibition of the New English Art Club (Dudley Gallery) are among the professedly slight studies and sketches at the entrance end of the room. A sketch which is admittedly a sketch one can study with satisfaction; a sketch which pretends to be a finished picture is not satisfying. Mr. Fry's "Louvre" (1) and Mr. Rich's "Beeding Bridge" (3) are good sketches, and also Mr. Rich's "Ditchling" (12); Mr. MacColl's "Eelpie Island" (7) and Mr. Wilson Steer's "Morning" (8) may be classed as bad sketches. Miss Grace Westray's "The Roan Cow" (21), though slightly executed and with little colour in it, is something more than a sketch—the animal and the details of the wooden structure are very well drawn. Among the oil landscapes those of Mr. James Henry please us most, especially "The Flower Farm" (40), in which there is a most bright and breezy effect of light and air; and Mr. Charles's "A Quiet Nook" is noticeable for its effect of sunlight. Mr. Furses's contribution is a large oil sketch (it can hardly be called more) called "Timber Haulers" (77), a cart and horses backed by a clay bank in strong light; it is a vigorous piece of composition, but a canvas of that size should show more finish to justify its existence; all that there is in it might be shown on half the scale. Mr. Mark Fisher sends one of his bright landscapes, "On the Essex Weald" (58), and a portrait which, to say the least, is not as attractive as the landscape. Mr. W. Rothenstein's two pictures of scenes in the Talmud school (52 and 105) contain fine earnest studies of heads.

THE CENTENARY OF THE WATER-COLOUR SOCIETY.

THE Centenary Exhibition of the Royal Society of Painters in Water-colours is an interesting event in the artistic world. No art society ever started in this country has had such a continuous and increasing success, so that at the end of its hundred years of existence it appears to be at the stage of its greatest prosperity. The progress in the art of water-colour painting itself, and the changes which have taken place in its aims and in the style of execution employed, form an interesting subject for consideration.

The Society was originally formed, as we learn from the historical preface to the catalogue contributed by Mr. Spielmann, from much the same motive which has recently led (though with less reason) to the proposal to form a Sculptors' Society—viz., the want of liberality and sympathy on the part of the Royal Academy. A hundred years ago water-colour was a comparatively new art, which had none of the history and prestige attaching to oil-painting; and the Academy, which was then, as now, practically an academy of oil-painters, would give no encouragement or advantage of position to the water-colourists, who accordingly determined to form their own society and hold their own exhibition. The spirited nature of this determination can only be fully realised when we consider that in those days the rule of the Academy was that no member of it could

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belong to any other artistic society, so that the first members of the Water-colour Society cut themselves off by their action from membership of the Academy. The first exhibition, however, held at Vandergucht's Gallery at 20, Lower-Brook-street, was an immediate success, 12,000 paying visitors having entered during the seven weeks that it was open. That the water-colour painters and the art of water-colour could stand alone was from that time demonstrated.

The number of members was at first limited by the rules to twenty-four*, and, in fact, only sixteen were actually elected. The following are the names of the original sixteen :—George Barrett, Joshua Cristall, W. S. Gilpin, John Glover, William Havell, Robert Hills, T. Holworthy, J. C. Nattes, F. Nicholson, N. Pocock, W. H. Pyne, S. Rigaud, S. Shelley, Cornelius Varley, John Varley, and W. F. Wells. Of these names it may be said that only those of Barrett and John Varley are now familiar to general amateurs of painting; among a smaller circle Cristall, Gilpin, Glover, and Havell are still familiar names; the rest are all but forgotten. Turner was precluded from joining by the fact that he was by that time a member of the Royal Academy. Times have changed since, and at the present moment the Society includes among its ranks the President and six other Members of the Royal Academy, and eight Associates of that body.

The change from the style of water-colour at the date of the foundation of the Society to that illustrated in the present-day exhibitions is remarkable, and in many respects it represents progress, but perhaps not entirely. The water-colour palette of early days was a very limited one, and its extension was almost a necessary condition for enabling the art to maintain its position against the more brilliant and varied resources of oil painting. In the present day the water-colour artist has as great range of colour as the painter in oils, and to a considerable extent avails himself, very often, of the means of laying on opaque colour. But though greater brilliancy may be obtained by this means, and some difficulties got over, the real genius of water-colour consists in the use of transparent colour, the abandonment of which takes from it a good deal of its special beauty and distinctive character. It is for this transparent effect, so especially suited for landscape, that water-colour really has the best right to exist as a separate art, and as, in the first instance at all events, a peculiarly English art, the best productions of which, even now, are not equalled anywhere abroad.

The sober tones ("sombre," one might sometimes say) of the school of Varley and his compeers have been replaced in more modern water-colour landscapes by a satisfying richness and variety of colour which in themselves are an absolute gain. But in the latest period of the Society's history one cannot but feel that we have seen attempts to make fascinating effects of colour which have nothing analogous in nature. One accomplished member produces views of cities or other architectural subjects which are like visions in a dream rather than reality. Others seem to make a study of a certain favourite effect of colour which comes into all their works, and which again is not a colouring or a texture recognisable in nature; or we find drawings in which the aim seems to be to try with how little truth or definition of detail the general impression of a scene may be conveyed. All these are, in their several ways, interesting artistic experiments, and have a fascination as long as they are new; but they will lose it when they lose their novelty. Nature is the safest basis for landscape-painting (which is more especially the sphere of water-colour), and those who desert nature for artificial effects may obtain a passing but not a permanent success. The time will come when their works will be looked on as experiments which are out of date.

In the preface to the catalogue it is hinted that there has been dissatisfaction among artists at the too exclusive attitude of the Water-Colour Society; in other words, the difficulty of getting elected. Our opinion is that of late years the Society has not been exclusive enough. In the main the exhibitions of the Society show a higher proportion of good work to bad than is to be seen in any other art exhibition; but if this is to be kept up they cannot be too particular or too hard to satisfy in their choice of new members. We are inclined to surmise that the election goes too much by capability of technique and not enough by considerations as to artistic aim and feeling. What good can such pictures as those of Mr. Glindoni do for any Society which wishes to keep to a high standard of artistic style and feeling? They may please a certain portion of the public, possibly; but the Society has a strong enough position to afford to be independent of the public. What good did they do themselves by the theatrical effects of the late Mr. Brewtnall? And other similar questions might be put. If the Society is to maintain its high position, it should confine its elections to artists who take art seriously, and not admit painters of merely commonplace or jocular pictures merely because they have acquired dexterity in handling the brush.

To come to the present exhibition, we do not know that the Centenary show can be said to be superior to the average of the exhibitions (a high average, no doubt), or quite equal, for instance, to the last one. It is a very good exhibition, but if there has been at all an attempt or intention to make it a specially significant one, it has hardly been realised. In hanging the first dozen or so of pictures, however, there has been an evident intention to present to the spectator, at the outset, a kind of series of examples of various classes of work and of subject. We have Mr. Eyre Walker, Nos. 1 and 5; the latter, "Fallow Land in Surrey—Mayweed," is a landscape out of its author's usual track, light and delicate in colour and depending much on foreground detail; Mr. Tom Lloyd comes second, with a landscape and figures; Mr. Herbert Marshall follows with "Ely Cathedral" (3); and Mr. Thorne Waite is fourth with "Romney Marsh in Sunset." Then comes Mr. Weguelin with a sample of nude figures on "A Wave-washed Shore" (6), a very good little picture except the waves; but they are not the main object; the two figures are charmingly grouped and drawn, and Mr. Weguelin appears to much more advantage in these freely-drawn and not highly finished figures, in a style of his own, than he did formerly in pictures which looked too much like attempts to emulate Sir L. Alma-Tadema on his own ground. An interior with figures, "The Connoisseur" (7), shows one of the recently elected members, Mr. Walter West, at his best (that election was no mistake, at all events). Mr. R. W. Allan's "Sheltered" (8) is a good example of his sea-coast class of works; in this case the ships are better than the sea, the colour of which is rather doubtful; and Mr. Paterson's "Moniaive" (9) is one of those broad, impressionist landscapes in which, without any detail, a kind of enamelled softness of colour suffuses. The scene, which is pleasing to the senses, but which leads one to ask whether one ever really sees that effect in nature. Mr. Matthew Hale's view of "Pisa" (10), and a landscape by Sir Ernest Waterlow, "Summer Evening, Hampshire" (11), bring us back to the regions of the *juste milieu*; and so the first page of the catalogue is filled, certainly with a sufficient variety of interest.

We know which is the most remarkable work in the exhibition, but the Hanging Committee did not, or they would have hung it in a more central position. Miss Fortescue Brickdale is the most notable artist among their recent elections, for she combines intellectual meaning with competent execution. Artists who put intellectual meaning into their pictures do not always quite keep the balance between art and moralising; Miss Brickdale has not quite done so in her "Scandal" (74), which is not altogether beautiful in a pictorial sense, nor does it tell its meaning very clearly. But her other work, "The Posthumous Child" (130), is a most remarkable production. It is an allegorical picture. In a deep glen, with her feet among thorns and thistles, a beautiful young woman in widow's mourning leans against the rocky barrier on the right, her figure and drapery designed so that they make the commencement of a curve which is continued above by an indistinct rainbow, within the line of which an angel, beautiful in colour, with outstretched wings, leans over to her, and in front of the angel hovers in the air a little figure of a naked infant with its hands full of forget-me-nots. It is as thoroughly a poem in painting as we have ever seen, and one in which the pictorial effect and composition are as complete as the pathetic interest of the picture. It ought to have been hung in the place of honour in the centre of the end wall, for in respect of the higher aims of art there is nothing in the room equal to it; but it is a work that not many people would really understand. The place of honour is occupied by Mr. Melville's "The Music Boat" (65), a very clever effect of spots of light and colour from Chinese lanterns and other accessories; but it is a clever piece of effect—no more. What may be called the colour-spot style of painting is remarkably illustrated in Mr. R. W. Allan's "Piazza de Popolo, Orvieto" (14), showing one of his favourite combinations of broadly painted architecture and a crowd in many-coloured costumes. Those who think that colour-spot painting depends on happy chances should notice the quite satisfactory delineation, at the proper distance, of the horse in the centre of the picture, and realise, on a closer view, that its legs are only spots of colour, the effect depending on the exactly right shape of each spot. What seems free and accidental in handling sometimes contains the most study. This is the newest method in water-colour painting; nor do we say "the old is better," necessarily, but it is different. Methods of widely different dates may be studied here. Mr. Callow, who has been an exhibitor ever since the present writer can remember the Society's exhibitions (and that is a long time), shows a large and well-composed scene in his "Castle and Town of Richmond" (35), in which, moreover, he is less mannered than in his too frequent repetitions of old German streets. Among figure pictures of importance is to be noted Mr. Anning Bell's "Music by the Water" (114), where four women form a very decorative group in front of a river and part of an old city; a picture quite out of the usual run, both in colour and composition. Mr. E. R. Hughes sends two important works. The first, "The Lesser Light" (125), the moon with a personifying maiden designed within her sphere, is the most ambitious and the most difficult, but perhaps not the most successful of the two; the nude figure rather wants beauty of line, and beauty of line is the chief justification for this kind of ideal. The other, "Perdita Found" (134)—"a barn, and a very pretty barn"—is a capital piece of Shakspeare illustration, both in the character of the old shepherd and the lovely face of the child. Miss Phillott exhibits a larger and more elaborated work on a classical subject than is usual with her, "The Herdsman of Admetus" (156), a picture with a good many figures, the divine Herdsman appearing on the left walking in company with a rural maiden, and with just an indication of being something more ethereal than the other shepherds; a pleasing rendering of an ancient legend. An artist who has hitherto confined himself entirely to decorative Greek subjects, Mr. Bulleid, has suddenly and unexpectedly taken a quite different turn, painting three scenes from the life of the Virgin—"The Annunciation," "The Mother's Love," "The Crucifixion" (192 to 194). The first is the best, though the air of realism of the Virgin and of the surroundings clashes a little with one's conception of the mystic character of the story; the angel is certainly not mystical at all; but one feels every sympathy with an artist who appears to feel that he has harped upon one string for too long, and who is seeking a new interest and a new class of subject. At present he is not so successful in this as he was in his Greek maidens with sculpture backgrounds; but he will perhaps go farther. One or two other members interest by flights in a new direction. Mr. Colin B. Philip has quitted his Highlands for the Norway Fiords; his grand scene on the Norang Fiord (47) is very fine, especially the middle distance mountains, though we do not know that it equals his treatment of the Scotch landscape; but of course, after years of painting and imbibing the feeling of one region of mountainous country, one does not grasp that of a new one all at once. His "Break in a March Storm, Loch Lomond" (62), is full of weather, so to speak. Mr. Robert Little, too, goes out of his usual beat in a scene with architecture and figures entitled "Homage to Lorenzo de Medici" (189), a picture of a class which does not interest us very much, though well done of its kind; his "Rising Storm on the Solway" (57), with the trees forming a wind-tossed screen in the foreground, is a fine landscape in a grand broad style, the only drawback being that the water of the Frith seems rather neglected; we know it is water from the composition of the picture; we should hardly know it otherwise. Among other landscapes not to be passed over are Mr. Eyre Walker's "November Sunshine, North Yorkshire Moors" (66), perhaps the finest landscape

* The present limit of numbers appears from the published list to be forty Members and forty Associates.

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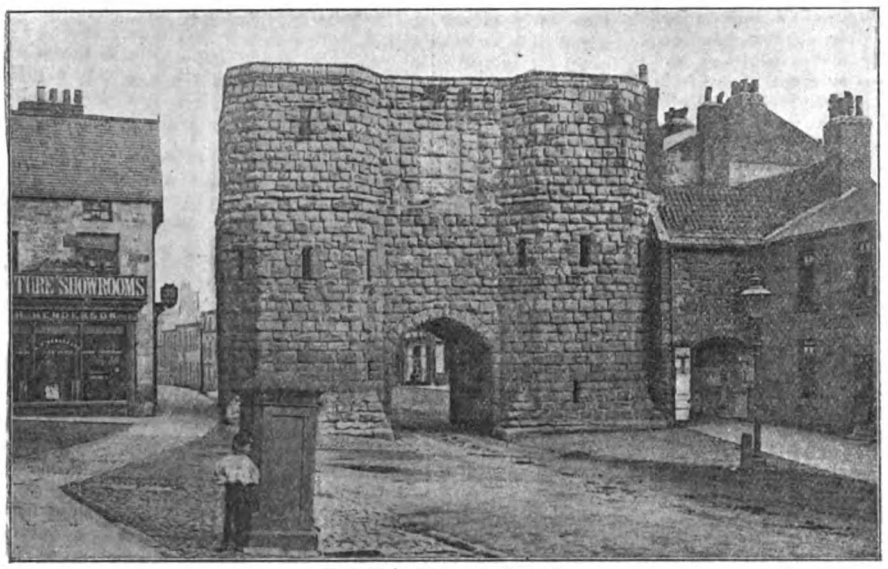

Hotspur's Tower, Alnwick.

in the room; Sir E. Waterlow's "The Mill Pool" (118); Mr. Pilsbury's No. 128 (no title), which includes an admirable study of a large tree; and Mr. Cuthbert Rigby's "Ennerdale" (143).

Architectural subjects are rather largely represented. Those by Mr. Rooke are all good and carefully studied, but a little dry and uninteresting in style. Mr. Albert Goodwin makes a perfectly beautiful picture out of "Durham" (137), taken from a point down by the river, but to the south of the Cathedral—not the most usual view; the scene in this case, though perhaps a little over-refined in effect, is not so purely visionary as some of his town and cathedral scenes. Mr. Reginald Barratt is the real architectural painter in the Society now, and all his works of this class are as nearly perfect as they can be; without neglecting pictorial effect, he gives the real appearance and texture of the architecture. A curious and very originally treated interior, "Evening, St. Jacques" (59), by Mr. Cameron, should be noticed; its main point is the colour effect of the red altar canopy seen in the background amid the cold colour of the stonework which forms a frame to it; we do not know if it is a real building; it is essentially a bit of interior effect, and very artistic as such. Mr. Herbert Marshall exhibits a fine and accurate view of Southwark Bridge and St. Paul's.

We should not have omitted to notice Mr. Hemy's excellent sea piece, or rather sea and ship piece (for the craft are as important as the sea), "A Yacht Race" (28), in a sense a repetition of the idea of his picture "Youth," but with a different composition. We may observe also that Mr. Walter West has painted a very interesting picture of "A Private View at 'The Old Society'" (195) in the early part of the last century, with a careful study of the costumes of the day; the pretty young girl in the foreground, with her wide bonnet, long frilled drawers down to her ankles, and the big sash with its ends dropping nearly to the floor, is an amusing reproduction of what we suppose some of the oldest people now living can remember as the dress of their sisters when they were boys.

We heartily wish the Society another Centenary as successful as this one. But to that end let them aim high and keep up their standard of admission, and never mind what people may say about being too exclusive. In art exclusiveness is a virtue.

MISSION HALL, GATESHEAD.—St. Hilda's Mission Hall, situated in Lobley Hill-road, High team, has just been dedicated. The building, 66 ft. by 32 ft. inside, and capable of accommodating 394 persons, forms the beginning of a scheme which the Church Extension Committee have in hand. It is of one story and built of brick. Internally it is fitted with an open timbered roof, and there is a glazed brick dado. The chancel is cut off by revolving shutters, so that the mission hall may also be used for entertainments when required. A classroom is to be added to the building later. The cost of the work completed is 1,418*l.* 2s. Messrs. Hicks and Charlewood are the architects, and the contractors have been Messrs. John Ross and Son.

OUR TOWN-WALLS AND THEIR GATEWAYS.

IN the press of new undertakings, discoveries, and requirements we seldom give any attention to our possessions in the way of the ancient fortifications of our old towns. In their day they must have been very great achievements, and only accomplished with immense trouble and great cost. We learn that the wall round Coventry was forty years in hand; that round Shrewsbury thirty-two; that round Alnwick took nearly half a century to complete. As we look back, it is curious to picture the most considerable towns in England and Wales, Scotland and Ireland, as all ringed round with high and thick walls, too high to be scaled without ladders, too thick to be overthrown without undermining or other long process, all of which were furnished with gateways capable of defence, varying in number according to the length of the circumvallation, and many of them with towers at intervals. Some had three gateways, some four, some six or seven. Coventry is counted to have had twelve, though Canterbury had but six, and Newcastle-on-Tyne seven, besides posterns. They consisted of an archway with a chamber or chambers above it, often flanked by a tower on either side, but not always, as we may see in Southampton and Lincoln. The archway was usually of the width to admit of two armed men on horseback riding through it side by side. Over it on the outer side were the machicolations destined to destroy or deter besiegers; within were gates, and very frequently portcullises, as the grooves made for their descent testify. The walls in many instances became encumbrances and were taken down; in others they were razed to the ground by royal edict as penalty for the part taken in the Civil War; hence it has come to pass that very few are remaining in their integrity. Many towns, however, have still fragments of them; and some that have taken down their walls have kept the gateways intact, or some of them. The principal gates of the City of London were taken down as inconvenient in 1760 and 1761, and the materials sold.

Berwick-upon-Tweed, York, Chester, and Conway have all maintained their walls in good condition to the present day. We can walk upon the tops of them all and survey the adjacent neighbourhoods from their height. They are wide enough for two persons to walk abreast upon them, and in some places at Berwick much wider. Berwick has three out of its four gateways still standing. They are named Scotchgate, Shoregate, and Cowgate, and the second and third have their massive wooden gates with their bolts and hinges. The fourth gate was named Bridgegate. The wall is not that which Edward the First built and Bruce strengthened, that the Percies and Douglases looked upon, but an earthern fortification faced with good stonework built in the days of Queen Elizabeth. It measures a mile and a quarter and 272 yards in length. It is wind-bleached and tempest-swept, but on parts of it the rocket, or *Diplotaxis tenuifolia*, grows plentifully.

The silvery-grey walls at York are in praiseworthy repair, as are the four great gateways or bars—Michelgate Bar, Bootham Bar, Monk Bar, and Walmgate Bar. The first-named was the one on which the heads and quarters of traitors were displayed. It still bears upon its noble front the arms of France as well as those of England; and on its summit are stone figures that were supposed to confuse besiegers as to the numbers of the garrison; it has, however, been shorn of its barbican. Bootham and Monk Bars have also lost their barbicans, but retain their portcullises. Walmgate still possesses barbican, portcullis, and embattlements, though the inner front has been altered from its original form to secure more accommodation within. Leland, writing of York, tells us that a chain of iron was passed across the river from tower to tower in his day, and that Fishergate Bar was walled up in the time of Henry VII. The wall is considered to have been built in the reign of Edward the First.

Chester, like York, had a wall as early as the days of the Roman occupation, and fragments of it and other Roman work are often found when excavations are made. There are four gateways to the present noble wall—East, West, South, and New Gates. No one can walk upon it without being reminded that Charles the First watched the fortunes of his followers from the Phœnix tower on it, and that the gallant city stood out for twenty weeks against the Parliamentary besiegers after Sir Marmaduke Langdale was defeated. The circuit of it is more than a mile and three-quarters in extent, and in some places it is twelve feet high, and in others more, according to the fall of the ground. It has been maintained by murage duties collected by officials called muringers. The memory of a daughter of King Alfred is associated with Chester, as having extended the first circumvallation of the ancient city.

The wall at Conway is a mile and a quarter in length. It has twenty-one semi-circular towers along its course, and three great gateways, besides posterns, or minor entrances. This was built by Edward the Frist, who also reared the walls round Carnarvon, some of which we may still see, and Beaumaris. Curiously, the name of his master-mason at Carnarvon has been handed down. It was Henry le Elreton.

We may gather that permission to enclose a town did not always include the means to do so. Edward the Third gave the inhabitants of Bamborough leave to strengthen and crenellate the borough with a wall of stone and lime, of which they do not appear to have availed themselves.

There are three documents preserved among the muniments of the Corporation of Alnwick that give us a good idea of the difficulties of wall-building. The burgesses obtained a licence to build a wall in 1433, which states that the town was open, and had been lately burnt by the Scots, in consequence of which danger the King gave his cousin Henry, Earl of Northumberland, and the burgesses leave to enclose the said town and embattle and machicolate the walls (Patent Rolls, Hen. VI.). In 1448 the town was still unprovided with this defence, and the Scots set fire to it once more. The first of the three documents in the possession of the Alnwick Corporation is a petition that the burgesses should be exempt from any fees for the licence. It states that the wall is begun, but cannot be finished for want of funds. The second document, dated April 9 and the forty-second year of the monarch's reign, sets forth that the burgesses had been again robbed and spoiled by rebels, and their dwellings burnt, and the King, who is mentioned as King of England and France and Lord of Ireland, in consideration of their misfortunes, grants them a port at Alnmouth and 20*l.* for thirty years out of the customs and subsidies with which they were to make the port, wall the town, and repair the parish church. The third document is "Letters Patent to gather a collection for building the town wall against the Scots." This is dated February 1473, or forty years from the issue of the licence. We learn, too, that William of Alnwick, Bishop of Norwich, left by will (proved at Lambeth 1449) 10*l.* for the walling of the town and 10*l.* more for repairing the church. When at last finished, this wall was about a mile in circumference, twenty feet in height, and six in thickness. It had four gateways—Bondgate, Clayport, Pottergate, and Narrowgate. Only the first-named of these is standing. It is three stories in height. Over the central archway is a panel on which was carved the Brabant lion, now almost obliterated. On either side is a semi-octagonal tower. The masonry is composed of huge blocks to which time and weather have given dusky tints. On the front facing the expected

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foes the openings are but little more than arrow slits; on that within, facing the town, are well-proportioned mullioned and transomed windows. The great ribbed archway is grooved for a portcullis now removed, and a low doorway on either side gives entrance to the chambers in the towers. Pottergate was rebuilt in the eighteenth century and crowns a steep street; only four corner-stones marked T indicate the site of Clayport. No trace of Narrowgate remains.

We come across mention of some of these old fortifications in the journals kept by travellers, as well as in the works of olden antiquaries. One Thoresby of Leeds wrote in 1681, "Over the moor from Morpeth to Alnwick, an ancient town fortified with a curious castle and an old wall." Evelyn mentions Coventry walls: "This citty has many handsome churches, a beautiful wall, a faire fine schole and librarie to it"; and York, he says, is "fairly walled, of a circular form watered by the brave river Ouse." Colchester, he tells us, had six gates and some watch towers, and he describes the walls as exceeding strong and deeply trenched, and mentions with deep feeling a bare space outside the wall where Sir Charles Lucas and Sir George Lisle were shot after they surrendered. Defoe, too, alludes to this bare place (where the inhabitants said nothing would grow), the battered walls, and breaches in the turrets, in his "Tour through the Eastern Counties." Pepys mentions walls and gates many times. On February 10, 1660, for instance, he writes that Monk had pulled down the most part of the gates and chains in the city, and on the 22nd that the House had voted that the gates of the city should be set up at the cost of the State; and a little later that the gates of the city were ordered to be shut and doubled guards to be placed everywhere. Concerning Southampton he wrote:—"The town is one most gallant street and is walled round with stone, etc., and Bevis's picture upon one of the gates." He made a note, too, that he saw the limbs of "some of our new traitors set upon Aldersgate, which was a sad sight to see." Dr. Johnson tells us he found the walls of Shrewsbury were not so good as those of Chester. Dora Wordsworth in her Scottish tour wrote that she and her brother and Coleridge walked upon Carlisle walls, which were broken down in places and crumbling away "and most disgusting from filth." Macaulay mentions that he walked on the walls of Londonderry four times. George Eliot records that she and Mr. Lewis walked with Sir Benjamin Brodie about Oxford and "saw the gardens of New College surrounded by the old city wall." Perhaps the most pleasing of literary associations connected with a gateway is that given us by a document preserved by the Corporation of the City of London. Geoffrey Chaucer rented Aldgate, "the whole of the dwelling-house above the gate of Algate, with the rooms built over, and a certain cellar beneath the same gate on the south side of that gate and the appurtenances thereof," and undertook not to sublet it, but to live in it himself all his life. The Mayor reserved the right to enter it in time of danger to the City, and to use it then as might be requisite. This gate, thus associated with "the Father of English Poetry," was taken down, with others, in 1760, and the materials were sold to the highest bidder. He gave 177*l.* for them. Ludgate when taken down brought but 148*l.*, and the others still less.

The use of gateways for the exposure of the heads and limbs of the vanquished or of the executed gives them a very different aspect. Those who have sought such matters out tell us that the head of the Earl of Northumberland, who perished on the field of Bramham Moor, was exposed on London Bridge, and his quarters at Lincoln, Newcastle, and York. The head of Hotspur was brought from the battlefield near Shrewsbury and placed on the gateway at London Bridge, and his quarters were taken to the gates at York, Lincoln, Newcastle-on-Tyne, and Berwick-on-Tweed. A few months afterwards, in both cases, writs were executed requiring the authorities of those places to deliver up the remains for "holy sepulture." The head of Wallace, another world-famed hero, was set on London Bridge, and his body on Berwick Bridge. The head of Montrose was fixed on the Tolbooth in Edinburgh. Argyll's head was exposed in the same place. The account of Margaret Roper's pious care of her father's head will come to mind, and its subsequent burial beneath the chancel of St. Dunstan's Church, Canterbury. Local offenders seem to have received local exposure, as a hermit who headed an insurrection in Canterbury in 1449 was executed, and his head placed on the Westgate there. A German traveller, Hentzner, who visited London in 1598 says he saw thirty heads on London Bridge. Temple Bar, somewhat later, competed in this terrible exhibition. Horace Walpole mentions that some people made a trade of letting spyglasses for others to look at the heads on Temple Bar "at a half-penny a look."

The various contrivances with which besiegers endeavoured to overcome the resistance of the walls are a study apart. There was the tall tower covered with hides, in which was a means of ascent that enabled those within, when wheeled sufficiently close, to attack those on the wall from the same level. This contrivance was called a sow in old Border verse. Then there was a lower erection made to be thrust close to the foot of the wall, that those within could make a hole through it, which the besieged circumvented by throwing heavy stones on it, and made useless by raising a new barrier that confronted the breach and left the invaders still outside of the defences. There were huge catapults that flung stones over the walls, and battering rams that were intended to shake them to their foundations. The devices of the besieged were as ingenious with their showers of molten lead, their masses of burning flax let down by ropes or chains to swing in front of the faces of the foe, their overhanging wooden additions to the tops of the walls, known in old writings as "huards," from which cover they could annoy any enemy that approached, and always feel their defence was stronger than the attack till famine began to tell. Very interesting illustrations of all these contrivances, and more, are given in M. Viollet-le-Duc's matchless work on the subject.

Among the fragments of walls still standing those at Newcastle-on-Tyne are very massy, sooty, and impressive. Those at Southampton are sufficient to show us how considerable the defence once was. Sandwich, that saw so many princes come and go, has only one gateway of those old times, but has a length of green embankments called the Boulevards. Rochester and Canterbury can point to fragments, if not "gallantly great" as Pepys would say, still of interest. In short, from whatever point of view we take up the subject, there is veritable attraction in it. S. W.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION:

"Volume I of THE BUILDER."

THE eleventh meeting of the Session was held at No. 18, Tufton-street, Westminster, S.W., on Wednesday evening, when the chair was taken by Mr. J. H. Pearson, and a paper was read by Mr. W. E. Davis on "A Retrospect: Vol. I. of the *Builder*."

Mr. W. E. Davis said that at the outset it was well to recall to their imagination London as it was in 1843, so far as it concerned so many of the buildings and places which were now looked upon as landmarks. Few things had affected this so much as the growth of railways, and in 1843 there was no Charing Cross, no Victoria, no Cannon-street, no Waterloo, Ludgate-hill, St. Pancras, King's Cross, or Liverpool-street, while the underground was not even thought of. Trafalgar-square had not long been laid out; the National Gallery had been finished about five years and must have looked somewhat of a patchwork, being partly of new and partly of old material from old Carlton House. The Nelson Column was just approaching completion as were also the British Museum, the Royal Exchange, and the Houses of Parliament, as well as numerous smaller but still important works. If London had changed, what was to be said of the journal, the first volume of which he had made the basis of his paper? The first number was published in December 31, 1842, and was evidently thrown out as a "feeler," as it was boldly announced as a "precursor number." It contained 48 columns made up of 4 columns of address, 1¼ columns of notices as to subscriptions and advertisements, 31 columns of advertisements, and 2 columns at the end of a sort of combination of address and puff; leaving 9¾ columns of matter for which the paper was ostensibly published, and even a great deal of this quoted. To him, it seemed that it must have had enormous vitality to have survived at all. They must, however, remember that it was a new departure and that up to this time there was, to quote the address, "no such thing as a builders' newspaper and magazine." There was no doubt that the paper was originally intended primarily as a periodical for the artisan, and the first edition was certainly most flattering to the trade which it termed "of the pick of British artisans, a class of the highest intelligence." The proposal was for a combined newspaper and magazine and the address said: "We would give him a book on his trade, worth preserving, and a newspaper, for the reading of his wife and family as well as for himself." One must come to the conclusion that either wives and families had changed or the conductors of the *Builder* at the present time had lost sight of the intention of the original promoters. He did not think the present editor, with his justifiable pride in the paper under his control, would seriously claim for it consideration as a family newspaper. The engraver must have been a godsend to the editor of the time, for his shortcomings were being frequently apologised for. In presenting a view of the new Town Hall at Colchester he made the date of erection twenty years ahead of his time, and in the plans of a pair of cottages by a "practical builder" the kitchens and back bedrooms to both and the staircases to one were shown without windows. History repeated itself, for they found complaints as to the non-recognition of architecture by the Academy; a reference to a commission for the improvement of the means of communication to different parts of the Metropolis; flying machines; competition scandals; the inadequacy of the payment of architectural draughtsmen and surveyors' assistants; a suggestion for supplying the Serpentine with salt water; the use of oil on a rough sea; emigration; trades unionism; wide tendering; housing of the working classes; electric lighting, and many other subjects, including a new Building Act, which, however, after being drafted, was postponed to the next year to be amended. It was evident from the commencement that to be a success the journal must be an illustrated one; but he was afraid that in these extravagant times the form of the illustrations would not appeal to the average reader of an architectural journal, they being generally of a somewhat scrappy nature. One number broke out with two full-page plates of a marvellous composition for a monument to the Duke of Sussex by Joseph Hanson, and another full page plate was that of the Infant Orphan Asylum at Wanstead, by Messrs. Scott and Moffett. The design was Elizabethan, far in advance of most of the work at that time, and fully justified the expectation that the authors would at a later date become eminent, as was certainly the case with the senior partner. At this time, St. Giles's, Camberwell, and the Martyrs' Memorial, Oxford, were in progress, and were more than once referred to in laudatory terms. A most ambitious design for the Washington Memorial, New York, of the worst type of the so-called Gothic, caused a sensation amongst the editor's correspondents. The illustrations were very unequal in quality, both in subject and execution. There were cottages of all descriptions, wooden houses of all shapes and sizes, and a Gothic greenhouse. The planning of some of the designs was extraordinary, while the elevations were beyond description. It was a plucky individual who would send a design, as it was no sooner published than a host of very candid critics made their appearance. As a contrast there were two delightful small outline engravings in No. 9, of the exterior and interior of St. Mary Redcliffe, Bristol, to illustrate the restoration by Messrs. Button and Hoskings, Button being the veteran author, while Hoskings was Professor of Architecture at King's College. Many of them had doubtless noticed the very gorgeous stucco fronted house in Princes-street, Hanover-square. In this volume they were treated to an illustration of it as a recently completed building, and found that it was built by a Mr. Fair, a house decorator, for his own business. The editor described it as "a sort of licentious indulgence of the fancy," but it was rather refreshing at this date to find him both here and in a subsequent reference arguing for plaster treatment, and not an imitation of a stone building. Another interesting, if extraordinary, subject was a design for a house built of mud, in a style a cross between Gothic and Egyptian, and this the editor described as being "a notable instance of the perversion of every principle of sound taste." On the opposite page was a good outline engraving of the Scotch Church, Crown-court, Covent-garden, and it was interesting to find that this was a mere refronting of an ugly existing building. An illustration of the Military Chapel, St. James's

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Park Barracks, was presented with the supposition that it "will provoke the bile in our Gothic fanciers, and at best find but few defenders." With regard to the Royal Exchange, it was clear that competition scandals were not the product of modern times only, both from this and other examples given. Mr. Davis then explained how Mr. Tite pulled off the job, and a writer in the *Builder* was rude enough to allude to the design as being "of the venison and turtle style of architecture, for the mouldings and enrichments of the various fronts are fat and bulky." To them as members of the Association the articles and letters respecting the lately organised "British Association of Architectural Draughtsmen," the precursor of the Architectural Association, was of supreme interest. The *Builder* proposed founding a school of art instruction for drawing, mensuration, modelling, etc., but the scheme fell through. The *Builder*, however, hailed with pleasure the B.A.A.D. and concluded the article by saying, "We are their humble servants in the promotion of this or any other end of their honest ambition." There was a still closer connexion between the *Builder* and the B.A.A.D., for the paper very generously published drawings for assistants, partly with the object of obtaining situations for the contributors. In No. 34 an interesting statement was given of the cost of the Houses of Parliament building. There was an interesting description by Barry of his proposed decorations, and the *Builder* rejoiced in the fact that there was a prospect that "architecture, sculpture, and painting are at length once more to be allied." A view of the completed British Museum by Sir Robert Smirke was given, and was severely criticised by both the Editor and various correspondents. A rather severe classic design for the new Town Hall, Colchester, was given in No. 13, and they were surprised to find that the architects were Mr. Raphael Brandon and Mr. Blore. Probably this was before Mr. Brandon became such a pronounced Gothicist. The FitzWilliam Museum at Cambridge, and St. George's Hall, Liverpool, were mentioned as works in progress, the latter being described as "the most chaste, classical, and perfect specimen of modern architecture which we have as yet seen." Pugin, although but thirty-one years of age at the time, was freely discussed in the volume by admirers and others, and St. George's Church was mentioned by the *Builder* as an example of what a church should be. They read of Professor Donaldson taking the chair at a meeting of the R.I.B.A., at which a paper was read on church building by Geo. Godwin, who afterwards edited the *Builder*; of Edmund Woodthorpe, District Surveyor and father of one of the present members of the A.A.; of Brunel the engineer; of J. B. Waring; of John Everett Millais, H. B. Garling, and E. B. Stephens, who gained medals respectively for painting, architecture, and sculpture at the R.A.

Mr. Davis proceeded to deal with some of the building materials advertised and referred to in the volume, and said, of all the new inventions of time, few, if any, attained such permanent importance as the practice of galvanising. There was no doubt that the *Builder* commenced an era of journalism, from which they all reaped benefit. It was only necessary to look at the twelve pages for 3d. and compare it with what they now got for 4d., even if only in illustrations, for them to be very lenient to the architectural student of sixty years ago, when they compared his work with that of the student of to-day.

Mr. Trotman proposed a hearty vote of thanks to Mr. Davis, and referred to the changes which had taken place in the *Builder*. Whether all the changes which had taken place were to its advantage, and whether the *Builder* had advanced with the times, was another matter. The paper was first started apparently for builders, and now he supposed it was an architect's paper. A builder a few days ago was telling him how badly the trade was served with papers, and said, "In fact we have no paper that we can call a builder's paper." It was a matter for regret to many old buildings had been pulled down to make room for such erections as Queen Anne's Mansions and the Hotel Cecil, and abominations of that kind, and there really seemed no excuse for offence against taste in the erection of this sort of building. He often thought it would be better if the *Builder* had its drawings reproduced in clear black and white line, in preference to ink photos of wash drawings, some of them were very smudgy. But the *Builder* had from time to time given them some splendid work—notably the drawings of the late Mr. Brewer and many noted architects. He supposed they could not expect to get such drawings week after week for 4d., but if the proprietors could not give them something decent every week that was actually being erected, they might give photos of old buildings. It seemed to him that the American papers reproduced their drawings much better than the English journals.

Mr. Trant Brown, in seconding the motion, said that it always struck him as curious that its name should be the *Builder*. The first volume evidently showed the difficulty the proprietors had in finding their feet. He felt that a great deal was to be gained from studying the back volumes of the *Builder*, and seeing the first illustrations of buildings which were now, comparatively speaking, old. One saw the change which had taken place in what he might term the architectural schools. In going through the country he found a really large amount of excellent work, none of which seemed to have found its way into the London architectural papers. How was it that the illustrations in the *Builder* were, for the most part, confined to London work, or work done by London men, whereas they found in many provincial cities work fully equal to, and in many cases beyond that which was illustrated.

Mr. A. Belcher said that for his part, the *Builder* seemed to be at its highest platform at this time, but he would like to see one page of illustrations of old work given every week, of cathedrals, abbeys, or old mansions.

Mr. R. H. Weymouth said it must be remembered that many rivals had entered the field, and as each paper got a *clientèle* of its own it must make it harder for the premier building paper of the day to get all the illustrations it would like to. He would like to see more working drawings of buildings, but as the Editor said when he last published them, they were rather hard to get.

Mr. L. Ambler referred to the criticisms and correspondence on designs in the first volume, and said he was rather glad that did not happen now. He was interested to hear of the Builders' Institute, of which Mr. Hanson seemed to be the director. With regard to what had been said, he thought they had only to look at any volumes of the *Builder* to see a great many old buildings, and sometimes nearly a whole number was devoted to drawings of old buildings by successful students. He knew, as a member of the Architectural Sketch Book Committee, that often they had to decide whether they would have beautiful drawings because the same things had appeared in the *Builder*. As regarded the provinces, he went about a good deal, and he had seen a great many provincial buildings illustrated in the *Builder*.

Mr. W. E. Wonnacott said it had struck him how enormously all technical journals had gained by the invention of photography. He felt, however, that if they stuck more to black ink in reproducing drawings it would be better.

Mr. J. S. Gibson, Special Visitor, said that some of the correspondence in the earlier numbers was most amusing, and an interesting fact was that the eternal question of competition was in existence then as now, and probably would be until the end of the chapter. Another interesting item was the information given regarding the British Museum design by Sir R. Smirke. That was of double interest, because the Government were now contemplating extending the Museum, and the Institute was engaged in the laudable attempt to secure that the work should be intrusted to some architect of sufficient eminence to complete it in a manner worthy of the State and the Institution. Had Mr. Statham been there he was certain he would have enjoyed the paper and discussion, and would have had his eyes opened to the extraordinary amount of incipient talent of those who would give him suggestions how to conduct an illustrated architectural paper. To his mind, even a paper so long established as the *Builder* had to keep pace with the times, and if possible to get ahead of them, and a comparison between the *Builder*, as representing the best that could be done in England, and the American journals was a perfectly fair and just one. There was no doubt that the best of the American papers were miles ahead of the best British papers in the quality of illustration. The suggestion for weekly illustrations of old buildings was an admirable one, but the *Builder* had done this to a considerable extent, and one of the things that paper could pride itself on was its series of cathedrals done by a whole galaxy of admirable draughtsmen. He would also advocate very strongly that the *Builder* should illustrate the finer plates from some of the rare architectural books, which many young architects would never be able to see otherwise. He thought builders ought to read the *Builder* as much as architects, for it contained really up-to-date information for their benefit.

The vote of thanks having been heartily agreed to,

Mr. Davis briefly replied, and said that with regard to the title, about halfway through the volume it was suggested that it should be called "The Builder and Landscape Gardener," and towards the end of the volume someone suggested that it should be called "The Architect." As to the illustrations, he personally regretted the passing away of the fine old wood engravings. As to the American journals, it must be remembered that they cost a great deal more than the English journals. He agreed with Mr. Ambler that in going about the country he came across a great many buildings he was familiar with by having seen them in the *Builder*. There were two Hansoms mentioned in the volume—Charles and Joseph. He believed that one of them was editor of the *Builder* for some time. One thing they could congratulate the *Builder* upon was the entire absence of advertisement in the ordinary matter—they never found "puff" articles.

ARCHITECTURAL SOCIETIES.

GLASGOW INSTITUTE OF ARCHITECTS.—The annual general meeting of this Institute was held on the 6th inst. in the rooms, 187, Pitt-street, Mr. Horatio K. Bromhead, F.R.I.B.A., President, in the chair. The Secretary read the thirty-sixth annual report, which stated that during the past session Sir James Guthrie, President of the Royal Scottish Academy, was added to the roll of honorary members. The number of ordinary members on the roll is now seventy-three. The President, in moving the adoption of the report, said that one of the most important improvements for the profession to which he looked forward was the openness and publicity of competition. They were indebted to the Corporation of Glasgow, who had been most successful in obtaining, by competitions, a number of good designs for public libraries. This was a great contrast to the Royal Infirmary competition. On a recent occasion the Lord Provost said that the design which the Governors were proposing to adopt had been submitted to their officials, who had indicated some details which it was thought required improvement. They might therefore conclude that there might at last be a dawning idea at headquarters that a grievous mistake had been made in casting out the designs that were pronounced the best, and in refusing to submit the inferior favoured one to public daylight. If he had not seen the front elevation of the chosen design, it would have been his opinion that any new building might have a better appearance than the old one. But the proposed sky-scraper could only be considered a calamity to the most venerable specimen of architecture in Scotland, the Cathedral. If it were for the public good, feelings might be stifled, but when it was known that the most modern and perfect ideas were dead against it, when one saw that the most remarkable modern hospital (Belfast) was only one story high, and the intended new building at Birmingham was to be only two stories high, one could not help seeing the ill-advisedness of spending a large sum of money after the manner of a bygone generation. However, the Institute might have a little comfort in the hope that their action had produced a limited modification of the defects. Looking ahead, there appeared to be a little cloud arising at their horizon, in the unfortunate tendency to divide the profession into two parties. On the one hand there were architects who seemed to want to make out that art was everything, and who struggled to get elected into some art atmosphere, which they possibly imagined was superior to architecture, where they could ignore business capacity and practical knowledge by employing skilled specialists to do the real work for them. On the other hand, they saw men who were content to make their work practical and businesslike,

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whose skill enabled them to use materials in a sensible and economical manner, but with little thought of suppressing what was ugly. From this point of view, the recent agreement between the School of Art and the Technical College, to confine the art teaching of architecture to the School of Art, and the constructive and scientific branches of architecture to the Technical College, was quite a disaster. The antidote was, however, in the air in the shape of statutory registration of architects, which had become the question of to-day. He hoped this would lead both sides to see that the happy medium was a combination of both ideas. The motion was adopted. The Council for the ensuing year was elected as follows:—Messrs. David Barclay, A. N. Paterson, John Keppie, Horatio K. Bromhead, James Lindsay, T. L. Watson, James M. Monro, Alex. M'Gibbon, Andrew Balfour, W. J. Boston, Charles Gourlay, J. A. Campbell, Thomas Baird, jun., R. D. Sandilands, James K. Hunter, and J. M. Crawford. The Treasurer's accounts, which were submitted and approved of, showed that the funds were in a satisfactory position. A meeting of the newly-elected Council followed, at which office-bearers for the ensuing year were appointed, viz.:—President, Mr. John Keppie, F.R.I.B.A.; Vice-president, Mr. James M. Monro; Auditor, Mr. David Barclay, F.R.I.B.A.; Secretary and Treasurer, Mr. C. J. MacLean. The various committees for the year were also appointed, including Committees on Public Architecture and on Architectural Education, etc.

DIAGRAMS OF "DRILLIBITE" APPARATUS.

THESE three diagrams show two forms of the tool called "drillibite," the objects and operation of which were described at some length in an article in our issue for November 21, 1903, p. 519.

Fig. 1 is an elevation of the apparatus arranged for operating upon a horizontal or approximately horizontal surface, such as a floor, a ledge, or rock, in a tunnel or any excavation.

Fig. 2 is the plan of the same apparatus.

Fig. 3 is an elevation of the apparatus arranged for operating upon a vertical or approximately vertical surface, the drill holder or cylinder being carried by a spreader bar.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on the 11th inst., Mr. D. B. Butler, President, in the chair, a paper was read on "The Latest Practice in Sewage Disposal," by Mr. H. C. H. Shenton, of which the following is an abstract. The author first pointed out that the practical engineering side of the question of sewage disposal as distinguished from the theoretical side had not received the attention it deserved in papers read on the subject. He then briefly reviewed the present methods of sewage disposal in the following order:—Natural and artificial precipitation, upward filtration, and the septic tank system, all for the removal of sludge; broad irrigation, lateral filtration and downward filtration, on land; the fine filter, the washed-out filter, the contact bed, and the continuously aerating filter. He stated that a careful examination of existing works throughout the country led him to the conclusion that each and all of the foregoing systems had their uses, and produced good results in certain cases. The biological methods, he said, included every recognised system of final sewage purification.

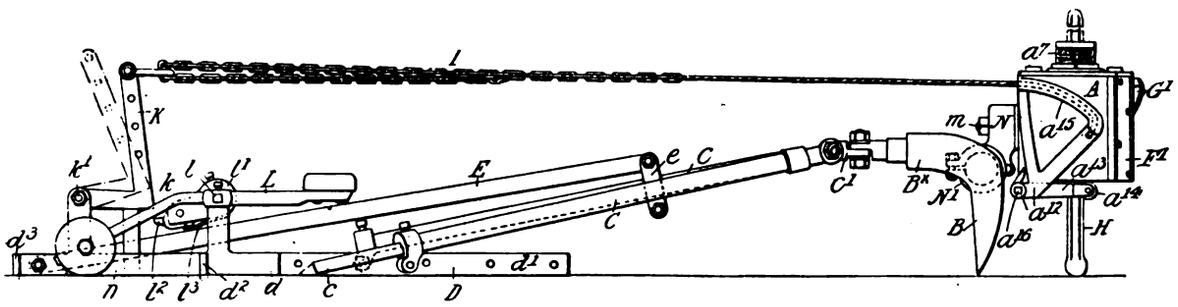

Fig. 1.

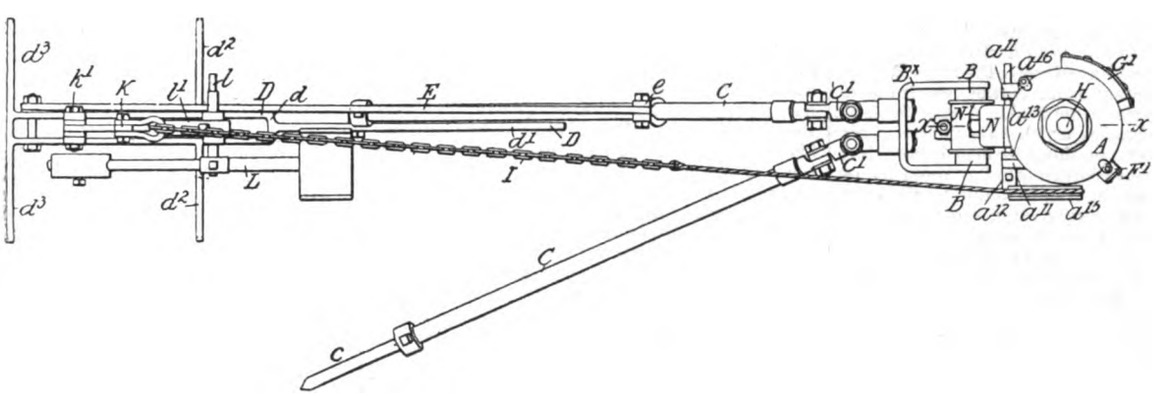

Fig. .

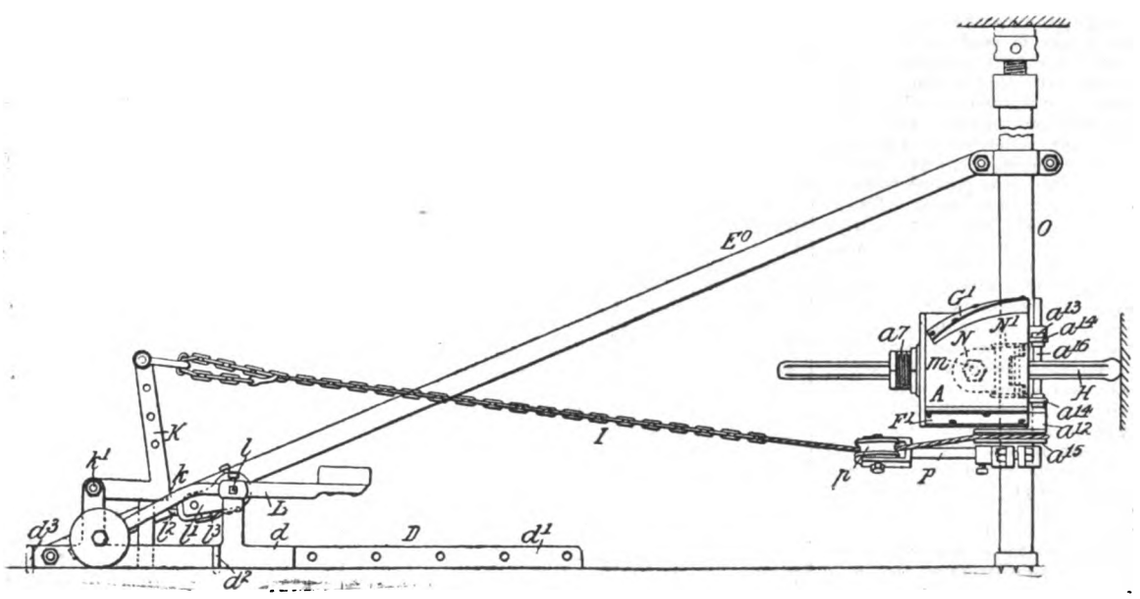

Fig. 3.

Diagrams of "Drillibite" Apparatus.

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Some of the details of construction of septic tanks, contact beds, and continuously aerating filters were then described. The absolute importance of proper construction in order to give theoretical principles fair play was insisted upon. Failures were often due either to bad design or construction or to careless working, and not to any mistake in principle. The contact bed and the continuous filter were compared; their depths were discussed, and also their practical advantages and disadvantages. Methods for overcoming the latter were suggested, which were, briefly, to keep the outlet of the septic tank at a sufficiently low level, to intercept sludge which by any irregular working passes out of the septic tank, to allow *humus* to wash out of first contact beds and to intercept it on the surface at the second beds, to catch the *humus* washed out of the continuously aerating filters in pools, channels, or on fine filters. The Dibdin bed of tiles and slates, designed to do the work of the septic tank, and the multiple contact system for places where the fall of the land is very slight, were referred to. In conclusion the author observed that, to his mind, the differences of opinion on the subject of sewage disposal was more of a theoretical than of a practical nature.

THE JUNIOR INSTITUTION OF ENGINEERS.—At the meeting of this Institution held at the Westminster Palace Hotel on the 8th inst. the Chairman, Mr. Samuel Cutler, jun., M.I.Mech.E., presiding, a paper on "Heating and Ventilating Small Workshops" was read by Mr. Kenneth Gray, M.San.Inst. Member. Employers of labour, he said, are beginning to pay attention to the ventilation and warming of their shops. Experience shows that, apart from the benefit which the employees derive from healthy and comfortable surroundings, a real economy is effected where a large quantity of fresh warmed air is continually passing through the shops. The breathing of impure air, charged to excess with carbonic acid, and laden with all kinds of animal, vegetable, and mineral impurities, greatly reduces the bodily vigour of the workpeople, and so contributes to slackness. It is unreasonable to expect that they can perform hard and arduous work when the air they have to breathe is such that they cannot obtain from it the nourishment which their exertions demand. A close investigation of the changes which take place in air in the process of breathing seems to show that expired breath, although at the moment of leaving the lungs no doubt tends to rise, yet is probably rapidly cooled, and, being a heavier mixture than fresh air, falls again almost at once. The fact that air at 32° F. is raised through 60° F., although in contact with the lungs for but two or three seconds, shows how rapidly its temperature is changed. And, as in breathing out, it is emitted through the nostrils in a downward direction in two attenuated streams, it seems probable that an equally rapid cooling takes place. Under these circumstances, if the ventilating outlet registers are placed near the floor level, and the fresh-air inlets above head level, and some mechanical power is used to drive the air into the shops, a continual stream of fresh air will be passing into the building, while the expired vitiated air is safely carried away through the extraction shafts. With all systems of ventilation it is necessary to provide means to warm the incoming air, and it seems advisable to do this while it is passing through the main duct leading to the shops. But it is a good plan not to heat the air to a high temperature; there are many reasons why it is advisable to heat it only to the same temperature as that which it is intended to maintain in the shops. The warming of the shops can best be secured by direct heating, *i.e.*, the fixing of the radiating surface inside the various shops. Where appearance is not of such importance as economy of space, this can be effectively done by fixing hot-water or steam pipes above head level. The only difference this makes in warming a building is that it takes rather longer to raise the temperature than when the pipes are fixed on the floor level; but as soon as the required temperature is reached it can be just as easily maintained. Rules and tables for calculating the required amount of radiating surface were given and fully explained, particular attention being called to the influence that the material of which the building is constructed, and the extent to which it is exposed to the cold winds, has upon the amount of radiating surface necessary.—Messrs. W. G. Wernham, Percy Young, J. H. Pearson, A. W. Marshall, T. C. Morewood, R. Marshall, G. T. Bullock, G. C. Allingham, J. N. Boot, J. W. Nisbet, and the Chairman took part in the discussion which followed, and much interest was shown in the relative merits of mechanical and natural ventilation, and the plenum and extractum systems. The author, in his reply, discussed these questions fully, pointing out that the large air change necessary in ventilating a crowded room represented a surprisingly great amount of mechanical work, which is far more than the difference of internal and external temperature could be relied upon to perform, especially when this difference was not great and the atmosphere was still; he therefore recommended some mechanical means to make sure of air change. With regard to the plenum and extractum systems, each had its merits, and good work could be done with both; everything depended on the design and erection of the apparatus.

Books.

Roman Hayling: a Contribution to the History of Roman Britain. By TALFOURD ELY, D.Lit., M.A. (Lond.), F.S.A., etc. London: Taylor and Francis. 1904.

A COUNTY which includes Calleva or Vindonum (Silchester), the Venta Belgarum of Scapula and Carausius (Winchester), Clausentum (Bitterne), the villas at Brading and Carisbrooke in the Isle of Wight, and other similar remains, to which we can now add those in Hayling Island, may justly claim to take high rank amongst those which visibly illustrate the Roman occupation of Britain. In this volume Dr. Talfourd Ely publishes his thesis for the degree of Doctor of Literature, describing, with views and a plan, the results of excavations he made, with his own unaided hands, during the interval 1897-1903, in the extreme south-east corner of the county of Southampton, where, moreover, there is still much more to be explored. Hayling Island, which consists of the two parishes of North and South Hayling, in Bosmere hundred, situated between Langston harbour and the Emsworth channel of Chichester harbour, formed a portion of the country of the Regni tribe of the Belgæ when Vespasian and his second, or Augustan, legion subdued for the Emperor Claudius that part—called Britannia Prima—of England. The scene of Dr. Talfourd Ely's explorations is a field of formerly common-land about twenty acres in extent known as the "Towncil Field" in the northern parish. He had observed that the ground on its eastern side gradually rose above the general level; coins had been ploughed up there and fragments of broken walls had been taken for the repair of roads in the neighbourhood. His labours were rewarded by the discovery of the eastern end of a building having an apsidal projection on that side and measuring, so far as one could judge from the appearances above ground, about 131 ft. from east to west by 63 ft. in width. The first portion he exposed is built up of flints and dressed blocks of hard chalk "about 6 in. square"; he also traced for some distance three walls that are 2 ft., 2½ ft., and 3 ft. thick respectively, and found considerable quantities of shells, rough pottery, etc., with scattered tesseræ indicative of the propinquity of a mosaic pavement. His researches in 1898-9 revealed the massive foundations, their breadth increasing from 3 ft. at the two ends to 10½ ft. in the middle, of an outer eastern wall of what he suggests was a barbican or beacon-tower, from which the sea is now distant only half a mile in all directions—the south excepted. Along the inner side of that wall lies a space, from 7 ft. to 8 ft. wide; on the western side of that space, and extending as far again northwards, lies the eastern wall of a rectangular enclosure 134 ft. by 143 ft., within which are the remains of a house planned after the "courtyard," as opposed to the "corridor," type and heated with horizontal flues beneath the floors—a method which the late Professor Middleton averred is peculiar to Britain. Within the enclosure is a circle of stone nearly 5 ft. thick, and having an interior diameter of some 37 ft., of which the precise purpose is not clear. To the extrinsic value of a *dupondius* of Domitian which he dug up Dr. Talfourd Ely attaches much importance. The inscription, "IMP. CAES. DOMIT. AVG. GERM. COS. XVII. CENS. PER. P.P.," on the obverse of the coin, which is but very little worn, testifies that it was struck when Domitian (whose title of "censor perpetuus" was, Dio says, peculiar to himself) was consul for the seventeenth time, that is to say, in A.D. 95. That circumstance, considered together with the character of the pavements, the total absence of the usual pilæ of stone or tile as found at Silchester and Caerwent, and other indicia, warrants the assumption that in Hayling Island we have evidence of a Roman settlement made less than fifty years after the subjugation of South-East Britain in the reign of Claudius by Plautius and Vespasian, and when the passage from Vectis was much shorter than it is now, much of Hayling Island having been since absorbed by the advancing sea.

Littlehampton and Arundel, with their Surroundings. By W. GOODLIFFE, M.A., late Scholar of Corpus Christi Coll., Cambridge. London: The Homeland Association.

THIS is neither a guide-book nor a learned treatise, but just a simple account of the villages and towns which are contained in what is called the "Rape of Arundel." Mr. Goodliffe takes each village in turn, beginning at those south-east of the river Arun and working round again to the north-east. There is abundant material for him, for nearly every hamlet owns a church that is noteworthy by reason of its age or some architectural peculiarity, besides many old houses with which curious legends are connected. For many of the architectural details the writer has availed himself of the notes taken by Mr. P. Johnston, who has made a study of the ancient churches of the district, including that with the Saxon tower at Sompting. Many of the beautiful walks are sketched out, taking either Littlehampton or Arundel as a starting-point, so that a stranger to this part of the country can easily find his way.

Disinfection and the Preservation of Food. By SAMUEL RIDEAL, D.Sc., F.I.C., F.C.S., etc., author of "Water and its Purification," etc. London: The Sanitary Publishing Company. 1903.

ALTHOUGH there is no intimation of the fact on the title-page, this is really the third edition of Dr. Rideal's book. The whole of the work has, however, been revised, and some new matter added to bring it up to date. By far the larger portion is devoted to the subject of disinfection; out of sixteen chapters and 494 pages only one chapter of twenty-eight pages deals specially with the preservation of food, but the subject is also incidentally discussed in other parts of the book. In an introductory chapter Dr. Rideal points out that the destruction of pathogenic bacteria "is the office of real disinfectants," and that *heat* is the most important agent for effecting this object. "Mechanical Disinfection" is the somewhat misleading title of the next chapter, which contains an account of the effect of light and other rays on bacteria of various kinds, and also passes in review a number of materials, such as charcoal, peat, infusorial earth, sand, etc., which are used for the purification of gases and liquids; filters of different types are briefly noticed, and also the effects of cold and desiccation. Of greater practical utility is the chapter on "Sterilisation by Heat," in which the author compares some of the most important apparatus in which hot air and steam are employed for purposes of disinfection; he confirms the general opinion that steam is more efficacious than dry air, and shows how the condensation which is one of the drawbacks of this agency may be obviated. Illustrations are given of steam-disinfectors used in this country and in Austria, France, Denmark, and Germany. Architects engaged in the construction of hospitals and sanatoria will find this chapter particularly valuable. Eight chapters, constituting rather more than one-half of the book, deal in detail with chemical disinfectants of nearly every kind, and are followed by a chapter on "Practical Methods," which is of more general interest. The author shows the futility of some of the methods commonly adopted, such as the occasional sprinkling of gullies with disinfecting powder, the placing of saucers containing disinfectants in bedrooms, the hanging up of sheets dipped in disinfectants, and fumigation by medicated lamps or candles. On the subject of fumigation by sulphur the author is not quite so explicit; he gives the opinions of a number of authorities for and against the process, but does

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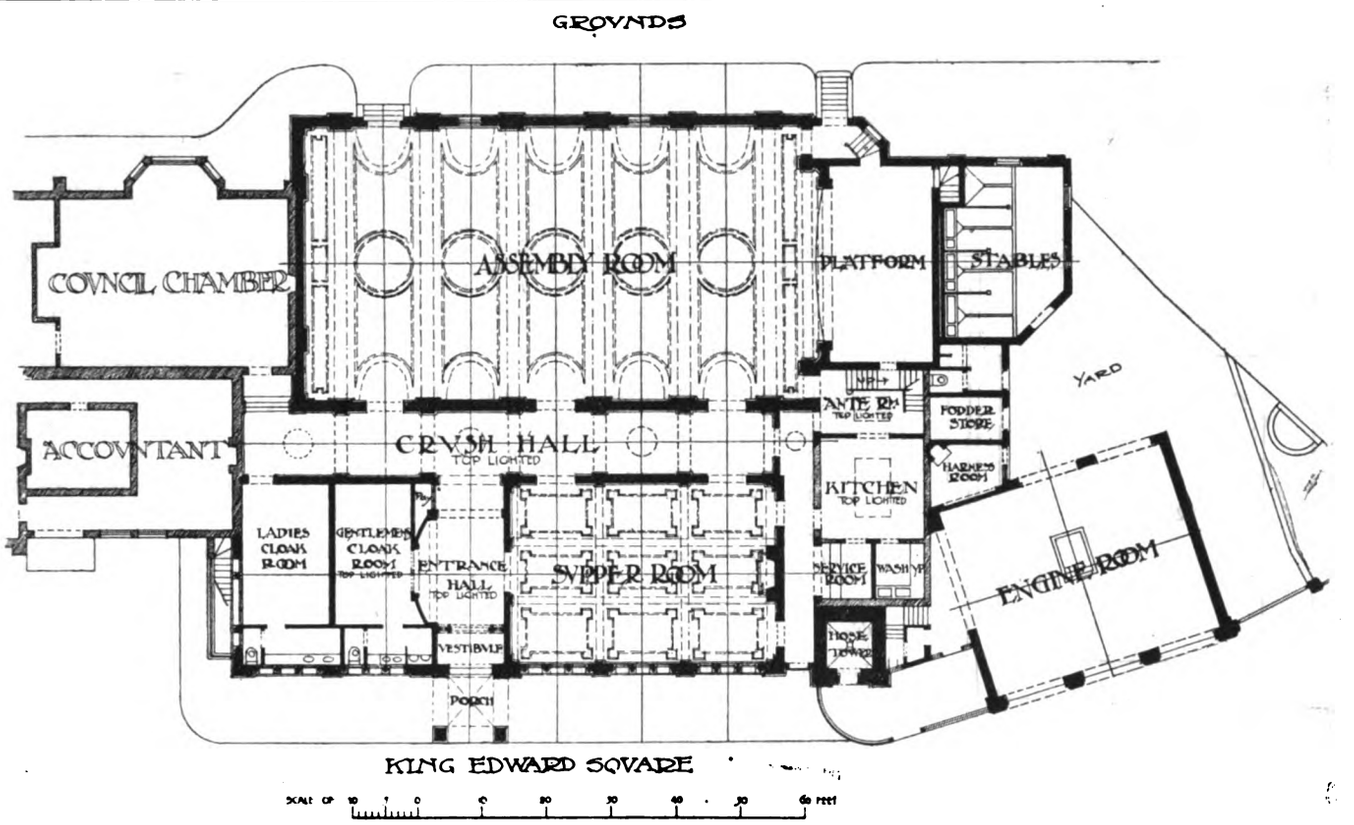


New Town Hall and Fire Station, Sutton Coldfield. Plan. (*See page* 414.)

not give the reader much assistance in deciding between the rival views. Our own opinion is that the value of sulphur fumigation has been very much over-estimated; if it is properly done it will kill fleas and bugs, but bacteria and the spores of bacteria are not so easily exterminated.

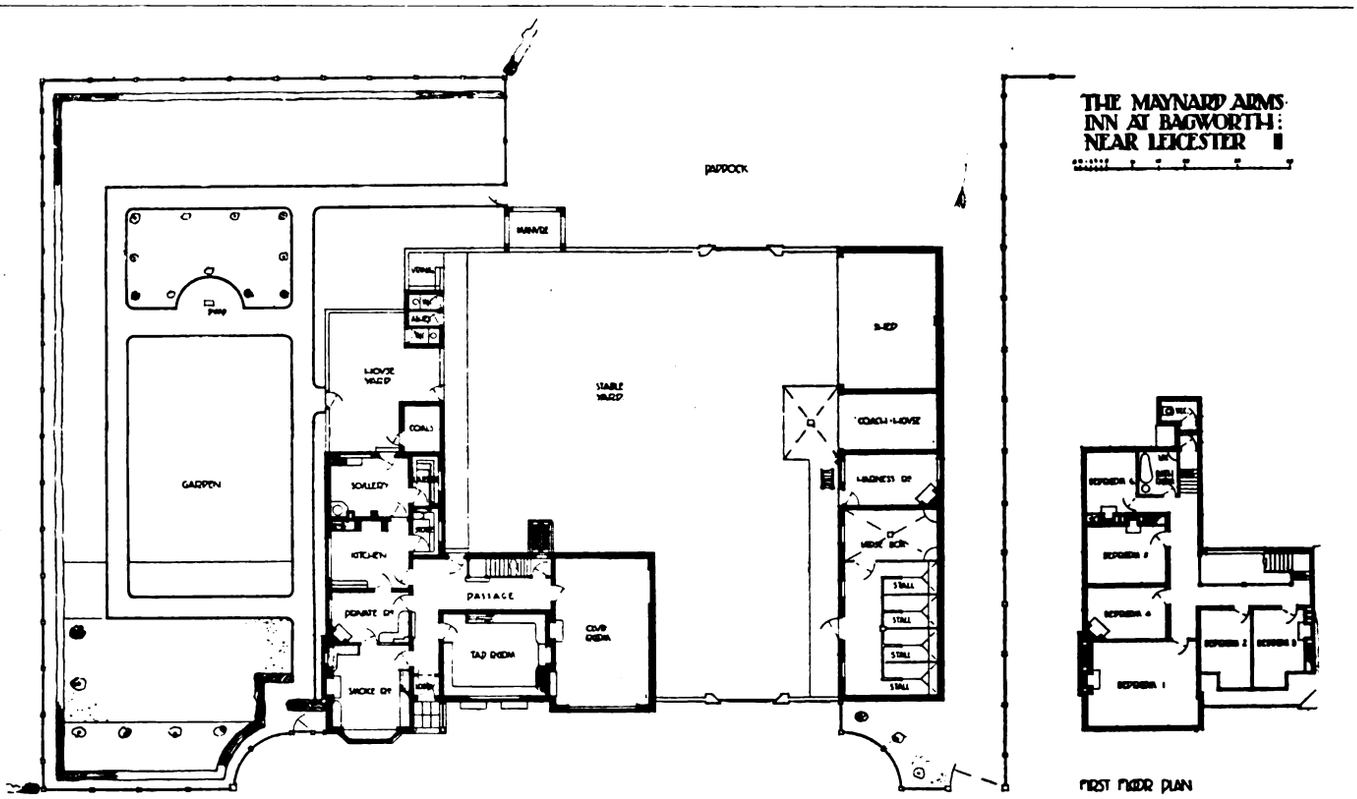
"Personal and Internal Disinfection" is the subject of another useful chapter, and "Legal Statutes and Regulations" are also considered. In this cursory notice we have only briefly mentioned a few of the most important features of Dr. Rideal's extremely valuable and interesting book.

The Law of Boundaries and Fences. By ARTHUR JOSEPH HUNT. Fifth Edition, by Henry Stephen, Barrister. London: Butterworth and Co. 1904.

HUNT'S Law of Boundaries and Fences has now reached so safe a place as a standard work that it is unnecessary to do more than notice the issue of a new edition, which is smaller in size than the fourth edition. There are also some improvements in the manner of printing which render the book more easy of reference. Altogether it would not be easy to find a book more useful both to laymen and lawyers.

Up-to-date Tables of Imperial, Metric, Indian, and Colonial Weights and Measures, etc. Compiled and written by ALFRED J. MARTIN, F.S.I. London: T. Fisher Unwin, 11, Paternoster-buildings, E.C. 1904.

THIS little book of about 250 pages contains a large amount of useful and interesting information on the weights and measures, moneys, etc., in general use throughout the most important parts of the British Empire, but its principal purpose is to advocate the adoption of the metric system. The author suggests what he considers to be the simplest methods of effecting the change, and states the advantages and disadvantages which it would involve in all the principal industries; he also advocates a number of modifications of the French system, in order to render it more suitable for British use. That the country is ripening for the change is clearly shown by the recent debate on the subject in the House of Lords, when politicians of both parties spoke in favour of it. All business men are agreed that an enormous amount of labour is wasted in the arithmetic of our current weights, measures, and money, and that a simpler system would eventually prove a boon, but many shrink from the initial worry and labour which the compulsory adoption of the metric system would entail. To all these Mr. Martin's book can be recommended; it will dissipate many of their fears, although, on the



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other hand, it may aggravate the opposition of some interested parties, especially the railway companies. The cost of effecting the change will, however, be a serious matter in the present state of the national finances, and will probably be the most potent factor in postponing its adoption; the substitution (by the Government) of new weights and measures for old throughout the country will not be such a profitable transaction as the exchange made for Aladdin's lamp. The book is a mine of interesting information and of valuable suggestions.

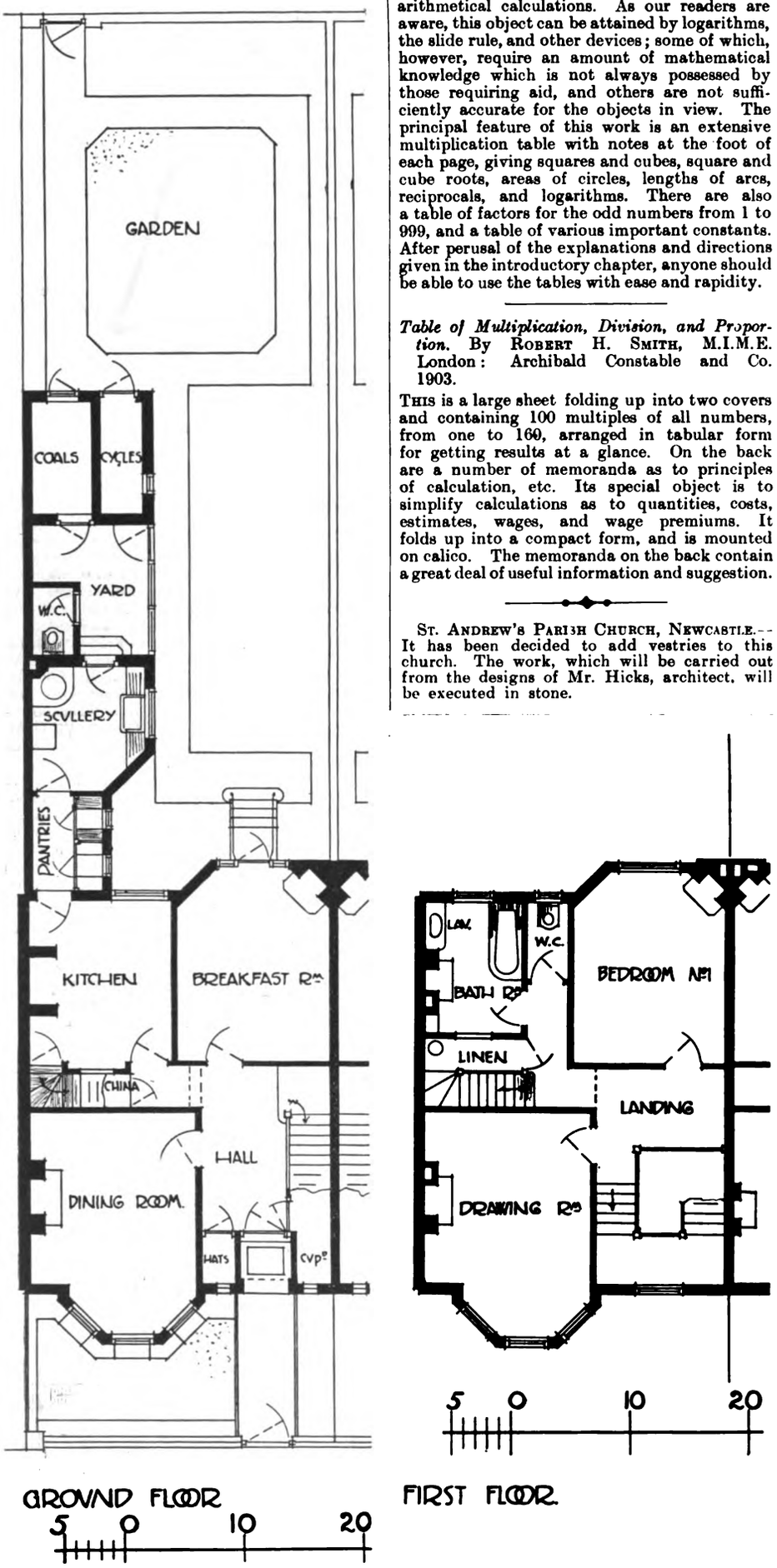
Calculating Tables and Collection of Frequently-Used Numerals. By DR. H. ZIMMERMANN. Translated from German into English by L. Descroix. London: Asher and Co. 1904.

IN this book we have a collection of simple and easily-applied tables intended to facilitate arithmetical calculations. As our readers are aware, this object can be attained by logarithms, the slide rule, and other devices; some of which, however, require an amount of mathematical knowledge which is not always possessed by those requiring aid, and others are not sufficiently accurate for the objects in view. The principal feature of this work is an extensive multiplication table with notes at the foot of each page, giving squares and cubes, square and cube roots, areas of circles, lengths of arcs, reciprocals, and logarithms. There are also a table of factors for the odd numbers from 1 to 999, and a table of various important constants. After perusal of the explanations and directions given in the introductory chapter, anyone should be able to use the tables with ease and rapidity.

Table of Multiplication, Division, and Proportion. By ROBERT H. SMITH, M.I.M.E. London: Archibald Constable and Co. 1903.

THIS is a large sheet folding up into two covers and containing 100 multiples of all numbers, from one to 160, arranged in tabular form for getting results at a glance. On the back are a number of memoranda as to principles of calculation, etc. Its special object is to simplify calculations as to quantities, costs, estimates, wages, and wage premiums. It folds up into a compact form, and is mounted on calico. The memoranda on the back contain a great deal of useful information and suggestion.

ST. ANDREW'S PARISH CHURCH, NEWCASTLE.—It has been decided to add vestries to this church. The work, which will be carried out from the designs of Mr. Hicks, architect, will be executed in stone.



Houses, Fosse-road, Leicester. Plans.

Illustrations.

TISSINGTON HALL.

ALTERATIONS and restorations have been going on here for some years. A plan showing what additions were to be made to the old building was published in the *Builder* on May 18, 1901. Messrs. Walker and Slater, of Derby, are the contractors. The architect is Mr. Arnold Mitchell.

SUTTON COLDFIELD TOWN HALL AND FIRE STATION.

THE design for these buildings as illustrated is the one selected by the Town Council for erection, and is a modification of the first premiated design in the competition, the fire station and hose tower being added in their entirety. The awkward character of the site for the fire station also necessitated alterations in the planning of the platform end of the assembly-room.

The main buildings are principally one story in height, the supper-room being placed on the ground floor, as being most convenient for use in connexion with the assembly-room, either for light refreshments at a buffet, suppers, or letting for small dances.

The fire brigade is a voluntary one, and there were, in consequence, special requirements which governed the planning of the fire station

The character of the work both outside and inside has been kept as simple as possible.

The existing council house adjoins the new buildings, from which it is quite distinct.

The architect is Mr. Arthur R. Mayston (of Messrs. Mayston and Eddison), London.

MAYNARD ARMS INN, BAGWORTH.

THE Maynard Arms Inn was built at Bagworth, a village near Leicester, for Messrs. W. Everard and Co., of Leicester, at a total cost of 2,781*l*. The walls are finished externally with rough cast. The roofs are all covered with old Swithland slates. The work was carried out by Mr. Walter Moss, of Coalville, under the supervision of Messrs. Everard and Pick, of Leicester.

HOUSES, FOSSE-ROAD, LEICESTER.

THE two houses on the Fosse-road, Leicester, were erected a few years ago for Mr. Henry Flude, at a cost of 2,300*l*. The facing bricks used are Woodville sand bricks, the work being carried out, under the supervision of Messrs. Everard and Pick, by Mr. F. Elliott, of Leicester.

OFFICES, ST. MARTIN'S EAST, LEICESTER.

THE offices in St. Martin's East, Leicester, were erected for Messrs. W. Cecil and H. B. Harris, solicitors, and overlook St. Martin's Churchyard. The major portion of the brickwork used on the front is that taken from the old building. The cast leadwork is from plaster models in low relief, the ground work of panels being tinned. All the joinery is in Kauri pine left from the plane, with the exception of that on the first floor, which is in oak. The cost of the works was 1,540*l*. The builders were Messrs. Henry Herbert and Sons, of Leicester, and the architects Messrs. Everard and Pick.

ORPINGTON CHURCH.

THE views of the exterior and interior of Orpington Church are given as illustrations to the first article in this issue, in which the history and architecture of the church are fully described.

UNIVERSITY COLLEGE, LONDON.—A course of ten lectures on "The History of Architectural Development" is to be delivered by Professor F. M. Simpson at University College. The lectures will begin on Friday, April 22, at 11 a.m., and, judging from the syllabus, the course will be an interesting and instructive one. The lectures will be illustrated by lantern slides, diagrams, photographs, and casts. After each lecture, from twelve to one, students will sketch from the diagrams, casts, etc., and from the slides, which will be repeated, or visit the British Museum. The fee for the term's course is 1*l*. 1s.

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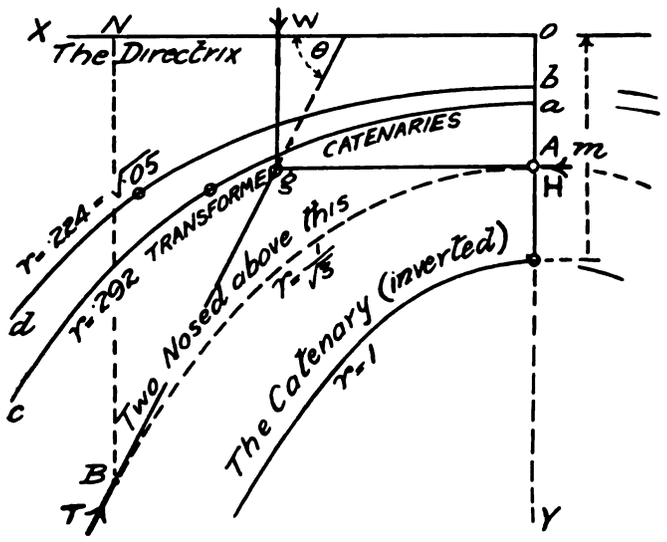

Fig. 63.

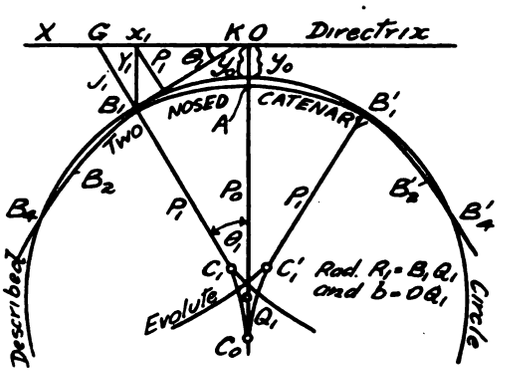

Fig. 64.

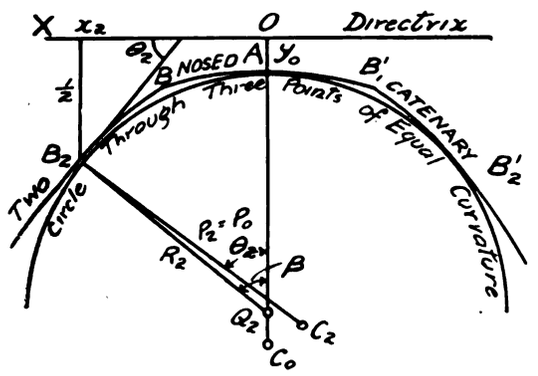

Fig. 65.

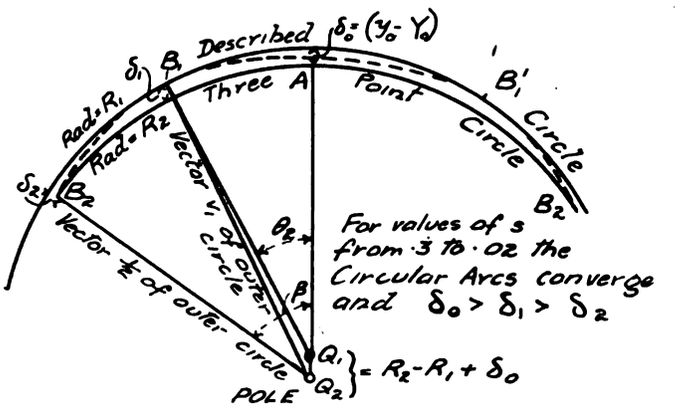

Fig. 66.

COMPETITIONS.

FREE LIBRARY, WAKEFIELD.—Eighty-one designs were received for the Free Library buildings, and, after obtaining advice from Mr. Maurice B Adams, F.R.I.B.A., of London, the City Council have adopted the Report of the Library Committee recommending that the premiums offered to competitors be awarded as follow:—Design No. 60 first premium, 80*l.*; design No. 17, second, 60*l.*; and design No. 66, third, 40*l.*

DISTRICT LIBRARY, HUTCHESONTOWN.—It is announced that the successful design for the Hutchesontown District Library was the one submitted by Mr. J. R. Rhind, architect, Inverness.

BOOKS RECEIVED.

HOW TO ESTIMATE: Being the Analysis of Builders' Prices. By J. T. Rea. Second edition. (B. T. Batsford. 7s. 6d.)

ADVENTURES AMONG PICTURES. By C. Lewis Hind. (London: Adam and Charles Black.)

DRAINAGE, SEWERAGE, AND CONSERVANCY IN TROPICAL COUNTRIES AND ELSEWHERE (the Belilios Prize article). By Major F. Smith, D.S.O. (London: J. Bale, Sons, and Danielsson, Ltd.)

REREDOS, ETC., CHADDESDEN, DERBY.—In St. Mary's Church, Chaddesden, a new reredos, an altar, oaken panelling, and communicants' kneelers were recently dedicated by the Lord Bishop of Southwell, in memory of the late Sir Henry Wilmot, Bart., V.C., K.C.B. The reredos has been erected from the designs of Mr. W. J. Tapper, architect, London.

A BURNE-JONES EXHIBITION.—An Exhibition of drawings and studies by the late Sir Edward Burne-Jones, Bart., will shortly be held at the Leicester Galleries, Leicester-square. It has been organised with the assistance of Sir Philip Burne-Jones, and will include over one hundred drawings, the majority of which will now be seen for the first time. In another room of the same galleries there will be an exhibition of a collection of old stipple engravings. The opening of both exhibitions is fixed for April 18.

The Student's Column.

ARCHES.—XV.

IT may be remarked that the modified line of stress in the segmental arch ring C C_1, Fig. 62, bears only a vertical load, the bulk of which is due to the area included between the soffit and the formation level. The remainder of the load is distributed in a similar manner because of the thickening of the arch ring from the crown to the springing. Rankine demonstrates (see Article XII., p. 316) that a catenarian curve is the correct form for an arch rib supporting a masonry spandrel wall of which the whole weight comes upon the rib. As catenarian curves form the base of Alexander and Thomson's method for the design of arches, it is important that their treatment should be clearly understood.

Fig. 63 shows a series of catenaries, among which A B is an arc of the curve balanced under the vertical load area N O A B, so that H and T meet at the point *g* on the line of action of W, drawn vertically through the centre of gravity of the load area.

From Rankine's "Civil Engineering," Article 128, the equation for the common catenary is:—

$$y = \frac{m}{2}\left(e^{\frac{x}{m}} + e^{-\frac{x}{m}}\right)$$

where y = the ordinate of any point in the catenary (as B N, Fig. 63);
m = the modulus, or parameter (as A O, Fig. 63);
x = the abscissa of any point having the ordinate y; and
e = the base of the Naperian system of logarithms.

The transformed catenary is obtained by parallel projection—that is, by increasing or decreasing all the ordinates of a common catenary by a given ratio, termed the *ratio of transformation*, and which we will denote by the symbol r.

The equation for the transformed catenary is:—

$$y = r\,\frac{m}{2}\left(e^{\frac{x}{m}} + e^{-\frac{x}{m}}\right)$$

If $r = 1$, the curve is the common catenary, as given by the former equation, and indicated in an inverted position by a thick line in Fig. 63. The transformed catenaries A B, *ac*, and *bd* correspond with the values $r = \frac{1}{\sqrt{3}} = 0{\cdot}292$ and $r = 0{\cdot}224 = \sqrt{\cdot05}$, respectively. An infinite variety of curves could be obtained by further variations in the value of r, the ratio of transformation.

It should be noticed, however, that any curves drawn below A B are of little importance in their application to arches. On the other hand, all curves above A B are of value in arch design. In the latter group the curvature is flat at the vertex, becoming gradually sharper until a point is reached such as that indicated by a small circle on *ac* and *bd*, and the curvature again flattens towards the points *c* and *d*, respectively.

The important ratio denoted by the symbol s is that of the depth of the load at the crown to the radius of curvature there, and in the transformed catenary is exactly the square of the ratio of transformation.

The value $s = \frac{1}{4}$ dividing the transformed catenaries into two groups—(1) those sharpest at the crown, and (2) those flattest at the crown—corresponds exactly with the value of s in Fig. 61. In that figure the value $s > \frac{1}{4}$ makes the conjugate horizontal load area entirely positive. Therefore, in an arch like that in Fig. 62, but with the formation level above the crown of the assumed line of stress by one-third or more of its radius, the horizontal load area would be entirely positive. If, then, an upper part were left out, the crown thrust would be decreased so that the modified line of stress would sharpen at the crown instead of flattening.

Two-Nosed Catenaries.—This designation is applied to catenaries in which the ratio of transformation is less than the square root of one-third. Curves of this description are discussed in considerable detail in the paper read by Alexander and Thomson before the Royal Irish Academy, and their work on "Elementary Applied Mechanics" contains that part of the treatment of the curves which was necessary for the construction of their tables for the direct design of segmental

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masonry arches. In the present article we omit mathematical demonstrations and expressions except those necessary for the explanation of the tables stating the properties of two-nosed catenaries.

It can be demonstrated that for values of r less than $\frac{1}{\sqrt{3}}$ there is a maximum radius of curvature ρ_0 at the crown, and a minimum radius of curvature ρ_1 giving a pair of points symmetrical about the crown or vertex. These points are the noses B_1 and B'_1 in Fig. 64. The abscissa, ordinate, slope, and radius of curvature of the nose B_1 are designated by x_1, y_0, θ_1, and ρ_1, respectively.

If ρ_1 be produced to meet the vertical through O at Q_1, and if a circle be drawn from Q_1 with a radius $Q_1 B_1 = R_1$, it will touch the curve externally at its two noses. This is called the *described circle*, and it is outside the finite arc B_2 A B'_2 here considered.

Fig. 65 shows a circle drawn from the centre Q_2, with a radius $Q_2 B_2 = R_2$, passing through the three points B_2 A B'_2 of common curvature. This is called the *three-point circle*. It touches the curve internally at A, and sensibly touches it at B'_2 and B_2 as the slope of the curve θ_2 and that of the circle at B_2 never differ by more than 2½ degrees. For all practical purposes this circle is inscribed in the curve.

Fig. 66 shows the finite arc B_2 B_1 A B'_1 B'_2 between the arcs of the *described* and the *three-point* circles. The distance apart of these two circles is $\delta_0 = y_0 - Y_0$ at the crown, and δ_2 at each end. As will be seen by Table IV., these distances are very small as compared with the length of the radii, and when used for the boundary of a load area the arc of the three-point circle is practically the same as the finite arc of the two-nosed catenary.

In Table IV. the modulus, m, is taken at unity, r at given values not less than $\sqrt{\frac{1}{3}}$, and various values for the different quantities have been calculated.

In Table V. the quantities are based upon the radius of the described circle, the value of which is taken as unity, and the table is derived by dividing each linear quantity in Table IV. by the corresponding value of R_1. Since s_1 θ_1 and θ_2 are independent of R_1, all the two-nosed catenaries in Table IV. can be constructed within a described circle of radius $R_1 = 1$, merely by changing each ordinate proportional to R_1. If R_1 has any value other than unity, it is only necessary to multiply the quantities by the new value of the radius. Table V. has for its purpose, in conjunction with supplementary tables, the designing of arch rings so as to secure the condition of the line of stress lying within a *kernel* forming the middle third, fifth, or ninth of the arch ring as may be required to give strength and stability for variations of the proportions of the structure, and of the nature and distribution of the loading.

Table VI. is derived from Table V., the value of s being unaltered. The thickness of the keystone is made equal to $3\,\delta_0$, thus confining the line of stress to a kernel which is the middle third of the arch ring, and the upper limit of the kernel is the described circle of the line of stress. The depth of the crown of the soffit from the directrix, or formation level, is $d = y_0 + \delta_0$. In order that the arch ring may increase in depth as it leaves the crown the soffit is made the three-point circle of a two-nosed catenary which lies at the distance d below the directrix at the crown. This result is attained as follows:—

In any line of Table VI. take the value of d, and divide it by the value of m in that line produced into Table V. Look in Table IV., under the heading y_0, for the calculated quotient, take the corresponding value of R_2 and place it in Table VI., under the heading R, after multiplying by m. The rise and span of the soffit are $k = R$ vers θ_2, and $2c = 2R$ sin. θ_2.

In the third column of the fourth line from the bottom of Table VI., and identified with the value $s = 0{\cdot}05$, the thrust of the crown $wd \times \rho_0 = 140 \times 0{\cdot}089 \times 1{\cdot}3634 = 16{\cdot}987$, and dividing this by $t_0 = 0{\cdot}061$, the average thrust on the crown joint is found to be 278 lb. per sq. ft. Multiplying by 2, as the maximum is double the average thrust, the maximum thrust on the keystone is seen to be 556 lb. per sq. ft. The value of f for sandstone, allowing a factor of safety of 10, is taken at 57,600 lb. per sq. ft., and, dividing this by 556, we have the maximum multiplier 104, as given in Table VI. Any smaller multiplier naturally increases the factor of safety.

In the fourth column of the same table the

TABLE IV.—PROPERTIES OF THE "TWO-NOSED CATENARY."
(FROM TABLE A.—ALEXANDER AND THOMSON.)

m	$r = \sqrt{s}$	$s = \frac{y_0}{\rho_0}$	θ_1	θ_2	R_1	R_2	ρ_1	$\rho_0 = \rho_2$	$y_0 = r$	Y_0	δ_0	δ_2
			deg.	deg.								
1	$\sqrt{\frac{1}{3}}$	·333	0	0	1·73	1·73	1·73	1·73	·577	·577	·000	·000
1	$\frac{1}{2}$	·250	19	28	1·97	1·98	1·94	2·00	·500	·499	·000	·000
1	—	·180	25	39	2·24	2·25	2·13	2·35	·424	·419	·004	·002
1	—	·170	26	41	2·29	2·30	2·15	2·42	·412	·406	·005	·003
1	—	·160	27	42	2·34	2·35	2·18	2·50	·400	·392	·007	·004
1	—	·150	27	44	2·39	2·40	2·20	2·58	·387	·378	·009	·005
1	—	·140	28	45	2·44	2·45	2·23	2·67	·374	·363	·011	·006
1	—	·130	28	46	2·50	2·51	2·26	2·77	·360	·347	·013	·008
1	—	·120	29	48	2·57	2·58	2·28	2·88	·346	·330	·016	·010
1	$\frac{1}{3}$	·111	30	49	2·63	2·63	2·30	3·00	·333	·313	·019	·012
1	—	·100	30	51	2·72	2·72	2·33	3·16	·316	·292	·024	·016
1	—	·090	31	52	2·80	2·80	2·36	3·33	·300	·270	·029	·019
1	—	·080	31	54	2·89	2·88	2·39	3·53	·282	·247	·035	·025
1	—	·070	32	55	3·00	2·99	2·41	3·77	·264	·220	·043	·032
1	$\frac{1}{4}$	·063	32	57	3·09	3·07	2·43	4·00	·250	·199	·051	·039
1	—	·050	33	59	3·28	3·24	2·46	4·47	·223	·156	·066	·054
1	$\frac{1}{5}$	·040	33	61	3·46	3·40	2·49	5·00	·200	·115	·084	·073
1	—	·000	35	90	∞	∞	2·60	∞	·000	—	—	—

TABLE V.—A SERIES OF "TWO-NOSED CATENARIES" INSCRIBED IN THE CIRCLE OF RADIUS (R) UNITY, AND HAVING PARALLEL DIRECTRICES AT GRADUATED DISTANCES (R + Y) FROM ITS CENTRE FROM (1 + ·187) TO (1 + ·023). (FROM TABLE B.—ALEXANDER AND THOMSON.)

s	θ_1	θ_2	m	R_1	R_2	ρ_1	$\rho_0 = \rho_2$	y_0	Y_0	δ_0	δ_2
·180	25°37	39°46	·4455	–	1·0024	·9491	1·0501	·1890	·1869	·0021	·0010
·175	25°58	40°28	·4410	–	1·0024	·9452	1·0543	·1845	·1821	·0023	·0011
·170	26°20	41°11	·4365	–	1·0024	·9413	1·0586	·1800	·1774	·0026	·0013
·165	26°40	41°53	·4319	–	1·0024	·9370	1·0635	·1754	·1726	·0028	·0015
·160	27°01	42°36	·4273	–	1·0024	·9327	1·0684	·1709	·1678	·0031	·0017
·155	27°20	43°18	·4226	–	1·0023	·9279	1·0738	·1664	·1629	·0034	·0019
·150	27°40	44°00	·4180	–	1·0022	·9232	1·0793	·1619	·1581	·0038	·0021
·145	27°59	44°42	·4132	–	1·0021	·9180	1·0856	·1574	·1532	·0042	·0023
·140	28°18	45°24	·4085	–	1·0020	·9129	1·0919	·1529	·1484	·0045	·0026
·135	28°36	46°06	·4036	–	1·0019	·9071	1·0990	·1483	·1434	·0049	·0029
·130	28°55	46°49	·3988	–	1·0017	·9014	1·1061	·1438	·1384	·0054	·0032
·125	29°12	47°31	·3938	–	1·0014	·8952	1·1142	·1392	·1333	·0059	·0035
·120	29°30	48°14	·3888	–	1·0011	·8890	1·1224	·1347	·1283	·0064	·0039
·115	29°47	48°57	·3836	–	1·0007	·8821	1·1318	·1301	·1231	·0070	·0043
·110	30°04	49°41	·3785	–	1·0004	·8752	1·1412	·1255	·1180	·0076	·0048
·105	30°20	50°25	·3731	–	0·9998	·8676	1·1521	·1209	·1127	·0082	·0053
·100	30°37	51°09	·3678	–	0·9993	·8600	1·1631	·1163	·1074	·0089	·0058
·095	30°52	51°54	·3622	–	0·9987	·8517	1·1760	·1116	·1019	·0097	·0064
·090	31°08	52°40	·3567	–	0·9981	·8433	1·1889	·1070	·0965	·0105	·0071
·085	31°23	53°27	·3508	–	0·9972	·8340	1·2043	·1023	·0908	·0114	·0079
·080	31°39	54°14	·3450	1	0·9963	·8246	1·2197	·0976	·0852	·0124	·0087
·075	31°54	55°03	·3388	1	0·9951	·8141	1·2384	·0928	·0793	·0134	·0097
·070	32°09	55°53	·3326	1	0·9940	·8036	1·2571	·0880	·0735	·0145	·0108
·065	32°23	56°45	·3259	1	0·9925	·7917	1·2803	·0831	·0673	·0158	·0121
·060	32°38	57°38	·3193	1	0·9910	·7798	1·3036	·0782	·0611	·0172	·0134
·055	32°52	58°34	·3121	1	0·9890	·7661	1·3335	·0732	·0544	·0188	·0150
·050	33°06	59°31	·3049	1	0·9870	·7524	1·3634	·0682	·0478	·0204	·0167
·045	33°20	60°34	·2968	1	0·9842	·7363	1·4037	·0630	·0406	·0223	·0190
·040	33°33	61°37	·2888	1	0·9815	·7203	1·4440	·0578	·0334	·0243	·0213
·035	33°46	62°49	·2808	1	0·9788	·7040	1·4843	·0526	·0260	·0263	·0236
Independent of R_1.					Directly proportioned to R_1, and subject to any multiplier.						

TABLE VI.—SUPPLEMENTARY TO TABLE V.
(FROM TABLE B_1—ALEXANDER AND THOMSON.)

Strong Brick. $w = 112$ $f = 154{,}000$.		Sandstone. $w = 140$ $f = 576{,}000$.		Granite. $w = 164$ $f = 1{,}350{,}000$.		Surcharge over top of keystone.	Depth of load from directrix to crown of soffit.	Thickness of arch ring normal to soffit at crown.	Thickness of arch ring normal to soffit at θ_2 joint of rupture.	Radius of the soffit.	Rise of segment of soffit subtending $2\theta_2$.	Span of segment of soffit subtending $2\theta_2$.	Sq. of ratio of transformation $= y_0 + \rho_0$.
Max. Multiplier.	Max. span.	Max. Multiplier to give factor of safety 10.	Max. value of span $2c$ with that Multiplier.	Max. Multiplier.	Max. span.	$d - t_0$	d	t_0	t_2	R	k	$2c$	s
				50	Feet. 72	·122	·141	·019	·026	·973	·325	1·451	·120
				55	81	·116	·137	·021	·029	·970	·333	1·462	·115
				61	90	·110	·133	·023	·033	·966	·341	1·473	·110
			Feet.										
				68	101	·104	·129	·025	·037	·962	·349	1·482	·105
		38	56	76	112	·098	·125	·027	·041	·957	·357	1·491	·100
		42	63	84	126	·092	·121	·029	·045	·952	·364	1·497	·095
		46	70	92	140	·085	·117	·032	·049	·946	·372	1·504	·090
		51	78	102	156	·079	·113	·034	·055	·940	·380	1·509	·085
	Feet.												
19	29	57	86	114	172	·073	·110	·037	·062	·933	·388	1·514	·080
21	32	63	95	126	190	·066	·106	·040	·071	·925	·395	1·516	·075
23	35	69	105	138	210	·059	·103	·044	·081	·917	·403	1·518	·070
25	39	77	116	154	232	·051	·099	·048	·089	·907	·409	1·516	·065
28	43	85	128	170	256	·043	·095	·052	·097	·896	·416	1·514	·060
31	47	94	141	—	—	·036	·092	·056	·110	·883	·421	1·506	·055
35	52	104	155	—	—	·028	·089	·061	·123	·869	·427	1·498	·050
38	57	—	—	—	—	·018	·085	·067	·141	·850	·431	1·480	·045
42	62	—	—	—	—	·009	·082	·073	·159	·831	·436	1·462	·040
46	67	—	—	—	—	·000	·078	·078	·177	·812	·441	1·444	·035
One-third.	—	$205 \div \frac{\rho_0 d}{t_0}$	—	Double.	—	Subject to a mult. less than given max., to give factor of safety greater than 10 in inverse ratio.							

w is in lb. per cubic ft. f is in lb. per sq. ft.

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maximum span between the points of rupture for a sandstone arch whose proportions are in accordance with the other dimensions stated on the same line is $2c \times 104 = 1{\cdot}498 \times 104 = 155$ ft. Multipliers and spans are given in columns 1 and 2 for brick, and in columns 5 and 6 for granite. In the seventh column $(d - t_0) = 0{\cdot}028$ is the surcharge.

The thickness of the voussoir at the joint of rupture sloping at θ_2 is thus obtained. The radius of the described circle as given in the fourth lowest line of Table V. is $R_1 = 1$. The radius of the soffit is $Q A = R = 0{\cdot}869$. If a circle were described from the centre Q concentric with the soffit and touching the described circle at the crown, its radius would be $R + 2\delta_0 = 0{\cdot}869 + 2 \times 0{\cdot}0204 = 0{\cdot}9098$. The two circles would be, as shown in Fig. 62, p. 393, the described circle of radius = 1, and the circle concentric with the soffit of radius = 0·9098. By the approximation in Article XIV., p. 394, the distance apart of these two eccentric circles at the springing is the difference of their radii multiplied by $(1 - \cos. \theta_2)$. Taking $\theta_2 = 59$ deg. 31 min. = 0·5073, and denoting the distance by Z, we have :—

$$Z = (1 - 0{\cdot}9098)(1 - 0{\cdot}5073) = 0{\cdot}044.$$

Adding the distance between the soffit and the circle drawn concentric to it, namely $2\delta_0 = 2 \times 0{\cdot}0204 = 0408$, we have, for the distance between the soffit and the described circle at the springing joint,

$$0{\cdot}044 + 0{\cdot}0408 = 0{\cdot}0848.$$

Increasing this by 50 per cent., to provide for the outer third of the arch ring, we get $t_2 = 0{\cdot}1272$, or, making a closer approximation, $t_2 = 0{\cdot}123$, as in Table VI.

The thickening of the arch ring from the crown outwards by this tabular method insures that the line of stress, commencing at the lower trisecting point or the crown joint, just reaches the upper trisecting point of the higher joint of rupture, Fig. 62, and returns towards the centre of the middle third of the arch ring.

In "Civil Engineering," p. 421, Rankine assumes that the condition of stability will be satisfied by insuring the centre of stress to be in the middle third of the crown joint, and of his 45 degrees joint of rupture. This is not sufficient, and Rankine was evidently unaware of the point of maximum curvature on the line of stress near the angle of 30 degrees.

Supplementary tables similar to Table VI. can be derived for other conditions as found to be necessary.

OBITUARY.

MR. FRANCIS NEWMAN, J.P.—The death has just taken place, at St. Paul's, Ryde, of Mr. Francis Newman, J.P., C.E., the County Surveyor for the Isle of Wight. Mr. Newman, who was seventy-three years of age, was a native of the Island, and was elected Surveyor to the Ryde Commissioners on January 13, 1857, and held office after the borough was incorporated until 1872. Then, owing to a municipal change of *régime*, he was out of office for a time, but was re-elected again in 1875, and continued to serve the town until 1897. He did much arbitration work, amongst other things in connexion with the construction of the Joint Railway works at Ryde. On the constitution of the Island as an administrative county he was appointed County Surveyor, which office he held at the time of his death. A few years ago his name was added to the Commission of the Peace for the borough. Mr. Newman was one of the founders of the Ryde School of Science and Art. When the Ryde Science and Art Council was constituted for its management he was elected chairman of that body.

MR. TUCKER.—The death is announced of Mr. Ernest Penkivil Tucker, of Trinity-road, Tulse-hill, in his forty-second year. Mr. Tucker was elected a member of the Architectural Association in 1881, and, having served his articles to his uncle, Mr. Samuel Tucker, of London, practised in co-partnership with Mr. Arthur Huntley, under the style of Messrs. Tucker and Huntley.

MR. J. MOSSOP.—News of the death of Mr. John Mossop, formerly in practice as an architect in Kidderminster, has been cabled from China. Mr. Mossop purchased the practice of the late Mr. T. D. Baker at Kidderminster, and was a well-known man in that borough. He became associated with the Volunteer force, and was Captain of the 3rd Kidderminster Company. He took great interest in various local matters. Mr. Mossop left Kidderminster about ten or twelve years ago to take up a public appointment in Hong Kong. Subsequently he moved to Shanghai. The deceased gentleman was forty-five years of age.—*Birmingham Daily Post.*

GENERAL BUILDING NEWS.

CHURCH, RAYNES PARK.—It is proposed to erect St. Saviour's permanent Church at Raynes Park, near Wimbledon. It will be built from the designs of Mr. Arthur C. Blomfield.

CHURCH, RADYR.—The dedication has just taken place of the nave of a new church to be known as Christ's Church. The new church, when completed, will consist of a nave, south porch, chancel, and vestries, and a tower and spire, of which the nave and south porch have been erected, the architect being Mr. G. E. Halliday. The window tracery and external dressings are of stone, while the open timber roof is covered with Pembrokeshire green slates. The work has been carried out by Mr. A. W. Cadwallader, Cardiff. The church at present will accommodate about 250 worshippers, and has been planned for a further extension to seat an additional 150. The cost of the portion erected will be about 2,000*l.*, and when the building is completed the cost is estimated at about 5,000*l.*

EAST END, ST. JOHN'S CHURCH, NORWICH.—Considerable progress has been made during the last twelve months with the east end of the Catholic Church of St. John Baptist, now being erected on the site of the old Norwich City Prison, at the expense of his Grace the Duke of Norfolk. The nave was opened for service on August 29, 1894, and the work now in hand comprises the chancel, transepts, and eastern chapels. Sir Gilbert Scott was the original architect, and the work has been carried on since by Mr. John Oldrid Scott.

CHURCH, HIGHWEEK, DEVONSHIRE.—Mr. Sedding, of Plymouth and London, has been selected as architect for the new church in the place of St. Mary's Chapel of Ease at Highweek. The preliminary plans have been approved. The total cost is estimated at 13,000*l.*, but it is only intended to carry out a part of the scheme first, leaving the tower to be erected at a future date.

NEW CHURCH, SEATON DELAVAL.—A new church is to be erected at a cost of over 1,600*l.* at Seaton Delaval. The new building will be of red brick and has been designed by Mr. Errington, architect, of Newcastle.

CHURCH EXTENSION, WEST DERBY.—The Bishop of Liverpool recently consecrated the new Church of the Good Shepherd in Carr-lane, West Derby. The new edifice is to form a chapel of ease to the West Derby parish church. The architect for the work is Mr. Oldrid Scott.

WESLEYAN CHURCH, OLDBURY.—A new Wesleyan church was opened on the 24th ult. in Barker-street, Tat Bank, Oldbury. The new building will accommodate 300 persons, and has cost between 1,700*l.* and 1,800*l.* Mr. E. Wood was the architect.

METHODIST CHURCH, LINCOLN.—The new Free Methodist Church in Portland-street, Lincoln, was opened on the 6th inst. The total cost of the new chapel is about 2,000*l.* The architect was Mr. J. H. Cooper, and the contractors were Messrs. W. and M. Halks, of Portland-street.

WESLEYAN CHURCH, PLYMOUTH. — The memorial stones of the "introductory" church and school-rooms at Mount Gold-road, Plymouth, were laid on the 4th inst. In addition to the "introductory" church, there will be a minister's vestry, school, and five class-rooms. The buildings already contracted for will cost about 4,600*l.*, and will occupy a third of a total area of 19,950 sq. ft. The total cost of the present scheme is about 6,000*l.* The contractor is Mr. A. N. Coles, and the architect Mr. H. J. Snell.

WESLEYAN CHAPEL, HAMPSTHWAITE, YORKSHIRE.—A new Wesleyan chapel has just been opened at Hampsthwaite. The buildings are in the Perpendicular style, and are built of local stone, and the roof is covered with blue slates. The accommodation comprises a chapel to seat 106 persons, exclusive of the choir; to the left of the building is placed a small schoolroom, which, when necessity demands, can be used as an adjunct of the chapel. A class-room and entrance-porch are on the same side of the main building, and on the opposite side is a minister's vestry and a small stable. The cost of the buildings complete will be about 800*l.* The architects are Messrs Bland. and Bown, Harrogate, the various work having been carried out by the following contractors:—Mason and bricklayers' work by Messrs. Barker Bros., Hampsthwaite; joiners' work and fittings by Mr. R. Settle, Summerbridge; slating by Messrs. J. and W. Baynes, Harrogate; plastering by Mr. C. Shaw, Harrogate; plumbing by Mr. G. Thompson, Leeds; leaded lights by Messrs. Kayll and Co., Leeds; wrought-iron railings and gates by Messrs. O. Atkinson and Son, Harrogate; tiling by Mr. Edwards, Leeds; acetylene gas installation by Messrs. S. Hudson and Son, Yeadon.

WESLEYAN EXTENSION, BRIGHOUSE.—The members of the Wesleyan community at Brighouse are about to erect a new mission hall, for which a site has been secured with a frontage to Birds Royd-road. Competitive plans were invited for the erection of a new hall, and the design submtted by Mr. A. G. Dalzell, architect, Halifax, was accepted. In addition to the hall there will be six class-rooms, four of which, by means of movable partitions, can be thrown into the hall. The cost will be from 800*l.* to 1,000*l.*

METHODIST CHAPEL, GRINDLEFORD.—The foundation-stones of a new Methodist chapel were laid at Grindleford Bridge on Easter Monday. The architect is Mr. J. W. Rowley, of the firm of Messrs. Billing, Son, and Rowley, and the builders are Messrs. Hill Bros., of Litton and Tideswell.

WESLEYAN CHAPEL, FINEDON.—The new Wesleyan Chapel at Finedon was opened recently. The new chapel, which will accommodate 600 people—440 of whom can seat themselves on the ground floor, 120 in the gallery, and forty in the choir stalls—has been erected by Mr. R. Marriott, of Rushden, under the superintendence of the architect, Mr. T. Dyer, of the firm of Messrs. H. H. Dyer, Son, and Winterburn, Northampton.

SUNDAY SCHOOLS, LOUGHBOROUGH.—Memorial stones and bricks were laid on the 4th inst. in connexion with the new United Methodist Free Church Sunday Schools, Sparrow Hill, Loughborough. The plans were prepared by Mr. W. H. Dinsley, of Chorley, Lancashire, and the contract for 500*l.* was given to Messrs. W. Corah and Son.

SCHOOLS, WEST BROMWICH.—The new Council Elementary Schools, which have been erected on the Lodge estate at West Bromwich, were opened on the 30th ult. by the Mayor. The schools provide accommodation for 1,060 boys, girls, and infants. The contract for the erection of the buildings was 12,225*l.* Mr. A. Long was the architect.

CARSTAIRS JUNCTION SCHOOL.—The opening of Carstairs Junction new public school took place recently. The architect was Mr. Trail, of Messrs. Trail and Steuart, architects, Lanark. The total cost of the school has been about 3,700*l.*

ADULT SCHOOL, SCARBOROUGH.—In Roscoe-street, Scarborough, off Falsgrave-road, a building has been erected from the plans of Mr. Fred Rowntree, architect, comprising a hall for public meetings, four rooms for smaller gatherings, a library, a billiard-room, and a kitchen. The primary purpose is to provide accommodation for some of the adult classes and for the social and intellectual recreation connected therewith, and incidentally to offer to lodges, trade societies, athletic clubs, and the like, a meeting-place free from the sale of intoxicants.

BUSINESS PREMISES, ST. PAUL'S CHURCHYARD.—New business premises have been erected at the corner of St. Paul's Churchyard and Dean's-court, from the designs of Messrs. H. H. and M. E. Collins, of Old Broad-street. The ground floor is of Labrador granite, while the five upper floors are of Portland and Beer stone. A feature of the elevation is the angle dome, with its copper cupola. The building has been carried out—under the supervision of Mr. A. T. Waterfield, acting as the clerk of works for the architects—by Messrs. Kirk and Kirk, of Westminster.

NEW PAVILION AND PIER EXTENSION, ST. ANNE'S-ON-THE-SEA.—The extensions and the addition of a new pavilion to the pier at St. Anne's-on-the-Sea have just been completed. The promenade, which was about 19 ft., has been widened to 34 ft., and a promenade 10 ft. wide has been made round the back of the old shops, and shelters provided half way up the promenade. The pier head, which was 66 ft. wide for a portion, and 95 ft. wide at the end, has been widened to 221 ft. all through. On the north side of the pier head a pavilion, with an auditorium, 84 ft. by 56 ft., with sitting accommodation for nearly a thousand people, has been erected. Messrs. Garlick and Sykes, architects, of Blackpool, prepared the plans for the work, the total cost of which was 30,000*l.*

CORONATION COTTAGE HOSPITAL, ILKLEY.—The Bishop of Ripon laid the foundation-stone on the 7th inst. of a cottage hospital at Ilkley, which is to be known as the Ilkley Cottage Hospital. For a beginning the hospital will provide accommodation for only six patients. The site of the new hospital is part of the Grammar School playing field, a few minutes' walk from the station along Springs-lane, which is now being widened and reconstructed. The building will be built of stone, and provision will be made for extension as funds are provided and circumstances require. The accommodation for patients will be on the ground floor, which will also contain an operating-room and a dispensary. The upper floor will be devoted to the nurses and staff, except the matron, who will have a room downstairs. The estimated cost of the site and

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building, the equipment not included, is 2,250*l*. Messrs. Adkin and Hill, of Bradford, are the architects, and the contract for mason's work has been let to Messrs. Waugh and Son, of Ilkley, and that for joiner's work to Mr. Thomas Smith, also of Ilkley.

CASUAL WARDS, HACKNEY.—The new casual wards erected by the Hackney Board of Guardians at Gainsborough-road, Hackney Wick, were opened on the 7th inst. The wards have been erected from the plans of Mr. W. A. Finch, the Guardians' architect, Finsbury-pavement, E.C., and provide a nominal accommodation for 106 inmates, including sixty-two men and forty-four women and children, but the building has been so arranged that this accommodation in times of pressure can be considerably increased. The building contract amounted to 25,100*l*., and the work has been executed by Messrs. Perry Bros., of Bishops-road, Cambridge Heath. The engineering contract amounted to 3,559*l*., and was carried out by Messrs. W. J. Fraser and Co., of Commercial-road, E.

BATHS, GARSTON.—Mr. W. R. Court, the Engineer and chief superintendent of the Liverpool Corporation bathing establishments, has prepared sketch plans, which have been approved by the Baths Committee, for the public baths which it is proposed to erect in Garston.

NEW PREMISES, TOTTENHAM COURT-ROAD.—The premises at 64-67, Tottenham Court-road have been rebuilt for Messrs. Catesby. The lower portion of the elevation is of polished granite with massive columns, the upper portion of Portland stone with Ruabon red facings. There are two ornamental copper domes to roof. The interior fittings, including the carved oak and teak staircase, are a special feature. The whole of the work (including fittings) was carried out by Messrs. Patman and Fotheringham, Ltd., builders and contractors, of Theobald's-road, W.C., and Liverpool-road, Islington, N., from the plans and under the supervision of the architect, Mr. H. A. Whitburn, of Surrey-street, Strand, W.C., and of Woking.

WAREHOUSE, GLASGOW.—With reference to a paragraph which appeared under this heading in our last issue, Messrs. Alexander Ritchie and Co., of Upper Thames-street, E.C., ask us to state that they supplied the ten electric-light pillars for the outside of the premises.

CO-OPERATIVE SOCIETY OFFICES, LEICESTER.—The new offices which have been erected by the Leicester Co-operative Society at the corner of Union-street and Freeschool-lane, Leicester, were opened recently. The architect was Mr. Arthur H. Hind, and the work was carried out by the building department of the Society.

STAINED GLASS AND DECORATION.

WINDOWS, TRINITY METHODIST CHURCH, PUDSEY.—Two stained-glass memorial windows have just been placed in this church. The subject represented is "Christ the Consoler." The figure is standing with open arms saying, "Come unto Me all ye that are weary." Around him are the various representatives of the human race—the Magdalene, the prisoner, the traveller, the penitent, the mother with her sick child—and holding on to the robe of Christ is a little child who has found a friend in Him. In the other window the subject is "Dorcas," who is represented giving away garments to those who are in need. These windows have been designed and executed at the studios of Messrs. Kayll and Co., Leeds. The architecture of the building is classic, and the subjects are surrounded by a classical canopy in silvery tones.

MEMORIAL WINDOW, NEWCASTLE.—A memorial window was unveiled on the 26th ult., in the Jesmond Presbyterian Church, Newcastle, in memory of the late Alderman John Price, J.P. The new window consists of three lights, and it has been placed in the chancel of the church. The artists for the work were Messrs. Kempe, of London.

MEMORIAL WINDOWS, PREMNAY, N.B.—Two stained-glass memorial windows have been placed in the Parish Church, Premnay. Mr. E. Copland, of Aberdeen, designed and executed the work. The subject of the windows is "Easter Morning."

APPOINTMENTS.

THE USHER HALL SURVEYOR, EDINBURGH.—At a meeting of the Lord Provost's Committee of Edinburgh Town Council, held on the 6th inst., a motion by Councillor Fraser as to the appointment of a surveyor for the new City Hall was under consideration. It was agreed to recommend approval of the appointment of Mr. George Morham, 29, Hanover-street, and to remit to a Sub-Committee to report on the terms of the appointment.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, LIVERPOOL.—The new reservoir at Prescot was opened by Lady Derby on the 30th ult. The reservoir is capable of holding 121,950,000 gallons, the total contents to ordinary draw off level being 110,213,000 gallons, equivalent to a four days' supply for Liverpool and the out districts served by the Corporation. The capacity of the reservoirs previously in use at Prescot is 86,000,000, equal to a three days' supply. The area of the water surface of the new reservoir is upwards of 27 acres, and the mean depth to the overflow level is 15½ ft. The contractors were Messrs. Holme and King; the engineer was Mr. J. Parry, and the resident engineer was Mr. J. R. Davidson. The cost of the work has been 138,365*l*.

NEW LIGHTHOUSE, DUNGENESS.—At Dungeness on the 31st ult. the new lighthouse, which has taken two years to construct, was brought into use for the first time. The old lighthouse which it replaces was built 114 years ago. The new lighthouse is circular in shape and 140 ft. high from base to top of the lantern. It stands 40 yds. inland from the old lighthouse. In addition to the high lighthouse a low light 40 ft. high has been erected close to the shoreline over a powerful foghorn. The main high light gives flashes every ten seconds. It is a white flash, lasting ·88 second, with an intensity of 144,000 candle power. A subsidiary light is exhibited from the same tower, showing red and green sectors. The focal plane of the main light is 130 ft. above high-water mark. The luminant used in the lantern is oil gas, burnt on the incandescent principle, the oil being vaporised. The old lighthouse is to be immediately demolished, except the base, which is being extended for residential and other purposes in connexion with lighthouse work. Mr. T. Matthews is the Engineer-in-Chief to the Corporation of Trinity House.

FOREIGN.

FRANCE.—In the Municipal Conservatories of Paris, on the Cours la Reine, an exhibition has been opened of the works of Isabey and of Raffet; also a collection of lithographs ("Salon National des Arts Lithographiques") and of illustrated postcards. The Salon des Pastellistes Français has also been opened at the Georges Petit Gallery; it includes works by MM. Aman-Jean, Besnard, Billotte, Latouche, Le Sidaner, Lhermitte, Georges Picard, and Mdme. Lemaire.——M. Carlier, the sculptor, has just completed a statue for the garden of the Elysée, under the title, "Danse Profane." It is to have as companion a statue by M. Ségoffin, entitled "Danse Sacrée."——The monument to the memory of Gambetta, which was the last work of Dalou, is in course of erection at Bordeaux, on the Allées de Tourny.——A monument in honour of the Republic is to be erected at Vichy; the model for it has just been completed by M. Coulon.——The works are shortly to be commenced for a new series of pavilions, to be added to the hospital at Noirmautier.——The new Ecole des Beaux-Arts, at Tourcoing, has been opened.——The Société des Amis des Arts, at Besançon, has organised an interesting exhibition of clocks and watches from the time of Louis XIV. to Napoléon.——The jury, in the competition opened at Annecy for the best new drainage system for the town, has awarded the first premium to M. Augustin Bonfort.——Important improvement works, including the erection of a new Casino, are to be undertaken at Paris Plage (Pas de Calais), at an estimated cast of 2,000,000 francs.——A stone bridge is to be built over the Loire at Digoin, in place of the old suspension bridge. The cost is estimated at 500,000 francs.——The death is announced, at the age of eighty-four, of Mdme. Herbelin, a miniature painter of great talent, and who enjoyed a high reputation in the time of the Second Empire.——M. Louis Seglas, architect, a former pupil of M. Guadet, has died at Paris, at the age of thirty-three. He had been, since last year, a member of the Société Centrale.——We have also to announce the death of M. Fernand Chailloux, the sculptor, the author of the monument erected to Pasteur, at Marnes. He was only twenty-six years of age. M. Chailloux was a pupil of M. Jules Thomas, and of the Ecole des Beaux-Arts.

BUILDING TRADES EXHIBITION IN SHEFFIELD.—From the 15th to the 23rd inst. the Drill Hall, Edmund-road, Sheffield, will be handed over to members of the building trade and others closely allied to that industry. The desire is to give manufacturers an opportunity of displaying their goods in a practical manner before the many thousands of interested buyers included in the district of which Sheffield is the centre. The organisers of the exhibition are Mr. C. D. Smith and Mr. J. W. Norman.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. E. Swinfen Harris, F.R.I.B.A., has removed from his former London office (8 and 9, Essex-street, Strand) to 40, Chancery-lane.——A partnership has been arranged by Mr. J. M. Porter with Mr. Adam Hunter, who for some time has assisted him in his business. The firm will be known as "J. M. Porter and Hunter," and will continue the practice as architects, surveyors, estate agents, and valuers at the Estate Office, Colwyn Bay.——Mr. A. Hessell Tiltman, architect, has removed to No. 1, Raymond-buildings, Gray's Inn, W.C. (first floor).

NEW CITY SHOWROOMS.—Messrs. J. Line and Sons, of 162 and 163, Aldersgate-street, and of Berners-street, Oxford-street, have just extended their city premises in Aldersgate-street by the addition of a new showroom. The firm has had showrooms at the West-End branch for many years, but, with a view to meeting the convenience of city architects, they have fitted up a large room on the ground floor in connexion with the Aldersgate-street premises, which is suitably designed for the purpose in view, viz., the exhibition of the wall-papers and other goods in which the firm deals. The room has been designed by Mr. Mayes, one of the staff, hand-stencilled, block-printed, and all kinds of wall-papers being displayed in the panels, while decorations in relief, etc., of the firm's latest designs are to be seen. A convenient arrangement for the exhibition of wall-papers and friezes is the cabinet-screen. The cabinet is constructed to contain a large number of screens, which can be drawn back so as to give the visitor a clear idea of the effect of different designs. Two of the most noticeable friezes are the "Fishing Fleet" frieze and the "Venetian" frieze, which are made so that the view repeats only once in 24 yds.

BIRKDALE IMPROVEMENT BILL.—Mr. Heywood Johnstone's Select Committee of the House of Commons has passed the preamble of the Birkdale Improvement Bill with various amendments. The bill contains a number of regulations dealing with the construction of new streets and sewers. The Committee struck out Clause 47, which sought to make a person erecting a building to a greater height than any adjoining building at his own expense build up the flues and chimneys so that the top thereof should be uniform with the top of the chimneys of the building so erected. They also struck out a clause limiting the height of buildings to be erected. It was agreed to give the local authority power to make by-laws dealing with the materials with which new buildings should be constructed, and for enforcing the use of fire-resisting materials where a new building was to be used by different families.

POLLOCK'S PATENT DOOR FURNITURE.—Mr. Pollock, of Messrs. John Pollock and Son, sends us a sample of a new patent for attaching door-knobs. One of the knobs is pierced with a circular opening about ¾ in. in diameter; the spindle goes through to near the surface of this knob, the end of it being made with a screw thread. A brass screw cap the size of the opening in the knob screws on to this. The frequent trouble of the knob coming off the spindle is thus rendered impossible. The appearance of the screw cap in the middle of the knob may be thought a little unsightly, but, except for door furniture which is decoratively treated, the advantage of firm and permanent attachment fully counterbalances this. The furniture is made and supplied by Mr. Barrett, ironmonger.

ADVANCED INSTRUCTION FOR PLUMBERS.—Arrangements, we understand, are now being made for the Special Course of Advanced Instruction for Plumbers at King's College, London, under the auspices of the Plumbers' Company and several of the County and Municipal Education authorities. The company have specially equipped workshops and laboratories at the college for the purpose of giving advanced instruction in the principles of science underlying the operations of the plumber, as well as in the practice of the plumbing craft, to plumbers who are, or are likely to become, teachers of plumbing classes. By these means it is hoped to train up an efficient body of teachers. The classes are held in the summer of each year, and plumbing teachers and advanced students desirous of availing themselves of the facilities available at the College should apply to the Education Authority of the town or county in which they reside for the requisite grant or scholarship to enable them to attend.

CLOCK, ST. PETER'S CHURCH, CARMARTHEN.—On Palm Sunday the Lord Bishop of St. David's dedicated a new Westminster chiming clock in St. Peter's Parish Church. The clock has one large dial facing west, and it has been made generally to the designs of Lord Grimthorpe by Messrs. John Smith and Sons, of Derby.

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MEMORIAL TABLET, ELY.—A memorial to the men of the Isle of Ely who fell in the South African War was recently unveiled in Ely Cathedral. The tablet has been executed in brass by Mr. M. A. Moore, of London.

CHURCH BUILDING IN THE DIOCESE OF YORK.—On the 5th inst. the Archbishop of York presided at the twenty-fifth annual meeting of the York Diocesan Church Extension Society in the Zouche Chapel, York Minster. Canon Pearson presented the annual report, which contained a review of the Society's operations, and mentioned that during the past twenty-five years in four of the more populous deaneries twenty-eight new churches have been built. In 1878 Hull had twenty—it now has twenty-six; in 1878 Rotherham had twenty-five—it now has thirty-two; Sheffield had thirty-one—it now has forty-one. In 1878 there was no Deanery of Middlesbrough—it was included in that of Stokesley. The town of Middlesbrough then had five churches—it now has ten.

THE SECRETARY FOR SCOTLAND AND BUILDING ACCIDENTS.—In the course of his visit to Glasgow on the 8th inst., Mr. Graham Murray, the Secretary for Scotland, received a deputation from the Parliamentary Committee of the Trades Congress, with representatives of workmen in the building trade from Glasgow, Edinburgh, Perth, Dundee, Aberdeen, and other towns in Scotland. The deputation urged that there was insufficient provision for protecting workmen against accident owing to unsafe scaffolding in connexion with the erection of buildings. Mr. Graham Murray, in reply, expressed himself as in hearty sympathy with the object of the deputation in taking measures to prevent injury or death. So far as Glasgow was concerned, there were, he thought, sufficient powers contained in the Buildings Regulations Act for carrying out what the deputation asked. To deal with the subject generally, he advised that a private member of Parliament should be asked to introduce a measure dealing with the subject. He was of the opinion that it would be for local authorities rather than the Government to appoint inspectors, as conditions differed in different towns.—*Scotsman.*

FIRES IN LONDON.—Much interesting information is given in the annual report of the Chief Officer of the London Fire Brigade which has just been compiled. The fires last year reported to the Brigade were 3,400 in number, 174 fewer than in the preceding year, and only sixty-one of these were classed as serious, as compared with seventy-six. The satisfactory results attained, the Chief Officer considers, are due in great measure to the augmention of the staff, appliances, and horses of the brigade, and of the facilities for securing rapid and efficient mobilisation. Details are given of the nature of the premises on which fires occurred during the year, and the causes of the outbreak. There were thirty fires on the premises of builders, all of which were of a slight character, and they were due to the following causes:—Tar boiling over, 3; fumigating adjoining house, 1; escape of gas, 1; hot ashes, 2; overheating of furnace, 1; light thrown down, 9; spark from fire, 2; spark from locomotive, 3; varnish upset, 1; unknown, 7. Amongst other premises on which fires occurred were the following:—Art metal workers, 1; art potters, 1; artists, 3; asphalte makers and paviors, 2; cabinet-makers, 29; carpenters and workers in wood, 5; carvers and gilders, 1; churches and chapels, 6; colleges, 3; contractors, 31; Government buildings, 7; hospitals, 9; house decorators, 2; lead and glass merchants, 5; lime and cement workers, 2; painters, glaziers, and plumbers, 2; parquet-flooring manufacturer, 1; potteries, 1; public buildings, 4; saw mills, 6; schools, 11; sign-writers, 2; stone and marble masons, 2; theatres and music halls, 7; and timber merchants, 11.

LAMPS AND SIGNS IN THE CITY.—The Streets Committee of the Public Health Department at the Guildhall has just issued a series of regulations relating to lamps, clocks, cranes, and projecting boards within the City. In future every application for a lamp, clock, or crane must be accompanied by drawings showing the dimensions, mode of fixing, and total projection from the frontage line. Lamps not used for shop-window lighting must not be less than 12 ft. from the footway, while their external dimensions, including frame and ornaments, must not exceed 5 ft. in height and 3 ft. in any other direction. They must not project more than 4 ft. 6 in. from the front of the house, or be less than 2 ft. from the carriage-way. Advertisements may be placed on the sides, but not on the bottoms, of such lamps, which must be kept lighted from sunset until the premises upon which they are fixed are closed. With regard to lamps used for shop-window lighting, the underside portion must not be less than 8 ft. from the pavement, the extreme projection over the public way not exceeding 3 ft. when the width of the pavement permits, and not less than 2 ft. from the carriage-way. The external dimensions of such lamps must not exceed 2 ft. 3 in. in any direction. No lettering, by way of advertisement, will be permitted on the dials of clocks, which must be synchronised with Greenwich time at the expense of the owners. Trade advertisement boards may be erected provided they do not exceed 3 ft. in width by 2 ft. in height and 3 ft. in thickness, with a projection of not more than 3 ft. 6 in. from the front of the building to the extreme edge of the board or tablet, but in no instance beyond 2 ft. inside the line of kerb. The height of such projections must in future be of a minimum of 9 ft. from the pavement to the underside of the board.—*Times.*

A QUESTION OF ASSESSMENT.—The appeal of Mr. Charles King Smith against the assessment of the Golden Valley Paper Mills, Bitton, near Bristol, which has been pending since June, 1903, and which was entered for hearing at the Quarter Sessions for the County of Gloucester just concluded, has been settled by compromise at a rateable value of 700*l.*, with an undertaking by the Assessment Committee that this figure shall not be disturbed for a period of three and a half years, and that they will pay the whole of the costs. The assessment objected to was a gross estimated rental of 1,300*l.* and a rateable value of 975*l.* The appeal was conducted by Messrs. Humphreys-Davies and Co., Surveyors to the Machinery Users' Association, of which the appellant was a member.

GOVERNMENT BUILDINGS AND BY-LAWS.—The Public Health Committees of Wandsworth, Southwark, and Battersea decided this week to support the appeal of Islington Borough Council to the Prime Minister asking him to promote legislation with a view to Government buildings being placed under the same by-laws as other buildings in respect of drainage and sanitary arrangements and the inspection thereof. A number of local authorities have the matter still under consideratior

RESIGNATION OF THE SURVEYOR FOR SCOTLAND.—Mr. W. W. Robertson, F.S.I., F.S.A. (Scot.), who for twenty-seven years has been the Principal Architect and Surveyor for Scotland of the Commissioners of H.M. Works and Public Buildings, has resigned his appointment and retired on a pension. Mr. Robertson recently suffered from a severe attack of illness. Mr. T. Oldrieve, from the Board of Works Office, London, has been appointed Mr. Robertson's successor.

CHELTENHAM COLLEGE WAR MEMORIAL.—The Right Rev. J. Taylor-Smith, Chaplain-General of the Forces, recently dedicated to the memory of the fifty-four Old Cheltonians who fell in the South African War a reredos which has been placed in the College Chapel. The reredos forms only a part of the memorial which will perpetuate the deeds of Cheltonians at the war. In June last an Eleanor Cross was unveiled in front of the College buildings by an Old Cheltonian, the late Sir Power Palmer, formerly Commander-in-Chief of the Indian Army. The reredos, designed by Mr. H. A. Prothero, himself an Old Cheltonian, follows more or less the lines of the great altar screens at Winchester and St. Albans. It fills the whole of the east wall of the chapel, beneath the window, and it reaches to a height of 24 ft. and a width of 34 ft. The architectural scheme comprises three main departments, divided by four pierced buttresses. The subject expresses two ideas, universal and national. The central and dominating figure is that of the Christ on the Cross. To the left of the Crucifixion group appear large figures (each more than 4 ft. high) of founders and champions of Christianity in this island. Nearer to the Crucifixion group and still on the left side are representations of four great archbishops, viz., Dunstan, Anselm, Becket, and Langton, each carrying the archiepiscopal cross and each being distinguished characteristically. On the Gospel side of the Cross are four representatives of the English Bible and Prayer-book—the Venerable Bede, Thomas Cranmer, John Wycliffe, and William Tyndall—and the larger figures on this side are representations of English Christian worthies. There are smaller statues in the two other departments of the reredos.—*Birmingham Post.*

CAPITAL AND LABOUR.

BRICKLAYERS' LABOURERS' STRIKE, TAMWORTH.—The bricklayers' labourers of Tamworth and district have struck work. They demand an increase of ¼d. per hour in their wages, which would bring their remuneration up to 6d. per hour. A uniformity in wages is also sought, and also the allowance of "walking time."

THE LEICESTER PAINTING TRADE.—A dispute has occurred in the Leicester painting trade. It is alleged by the operatives that they recently gave notice for a revision of the working rules, following the course laid down by agreement between employers and employed. In accordance with this agreement, the question should be submitted to a board comprising an equal number of employers and men, but it is said the masters refuse to meet. By resolution the operatives have agreed to appoint a deputation to prevail upon the employers to meet the board.

TEESSIDE JOINERS' WAGES.—The joiners employed in the building trade at the Hartlepools, Middlesbrough, and Stockton have given notice to the Teesside Master Builders' Association of their intention to demand an increase of their wages from 9½d. to 10d. per hour. The Association gave notice to the joiners nearly three months ago of their intention to enforce a reduction of a 1d. per hour at the end of the present month, and the application for an increase is a response to this. The men contend that the building trade is not so depressed as the masters would have them believe.

Legal.

EMPLOYER'S APPEAL UNDER THE WORKMEN'S COMPENSATION ACT.

THE case of Brindle *v.* Jones came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, on the 12th inst., on the appeal of the defendant from an award of the Judge of the County Court of Chorley (Lancashire) made under the Workmen's Compensation Act, 1897. The learned Judge awarded a total sum of 234*l.*, and the defendant now appealed on the grounds (1) that the employment in which John Brindle, the workman, who was killed, was engaged when he met with his death was not an employment covered by the Act; and (2) that the Judge was wrong in holding that the building upon which the workman was engaged at the time of the accident was "being repaired by means of scaffolding." It appeared that the defendant had contracted to carry out certain repairs to a building, and he sent three men, including the deceased, to the job. An hour after commencing work the accident occurred. The men were engaged in whitewashing an outside wall, each standing on a ladder, when the ladder on which the deceased was standing gave way and he fell from a considerable height and was killed. The question raised in the court below was whether the deceased at the time of the accident was engaged upon a building which was being repaired by means of scaffolding. The learned County Court Judge held that the ladders which the workmen were using at the time did not in themselves constitute scaffolding, but he found that scaffolding was being used, inasmuch as a step ladder from which a board passed to a wall had been placed in position for the purpose of, at some time, whitewashing another part of the building. He, therefore, was of opinion that the case came within the Act, and awarded the sum before-mentioned by way of compensation. Hence the present appeal, in support of which it was pointed out that up to the time when the accident happened the board and step ladder had not been used.

At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, said it was a queston of fact in this case whether or not scaffolding was being used on the building at the time of the accident. The County Court Judge held that scaffolding was being used and there was ample evidence to justify such a conclusion. The fact that the injured workman was in no way concerned with the scaffolding, or that it was something entirely remote from the part of the building on which he was engaged, did not affect his right of action under the Act. When once it was ascertained that scaffolding was being used, then the right of the workman came in, and he was entitled to compensation under the Act. He thought that the appeal failed and must be dismissed with costs..

The Lords Justices concurred.

Order accordingly.

Mr. Ruegg, K.C., and Mr. A. Elliott appeared for the appellant, and Mr. Ernest E. Wild for the respondent.

BUILDERS' APPEAL UNDER THE WORKMEN'S COMPENSATION ACT.

THE case of Norman and Burt *v.* Walder came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, on the 12th inst., on the appeal of the employers from the decision of the Judge of the Hayward's Heath County

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Court under the Workmen's Compensation Act, 1897. It appeared that the applicant was a machinist in the employment of the appellants, builders and contractors, and when the accident occurred he was in receipt of wages amounting to 1*l.* 17s. a week, out of which he maintained himself, his wife, and his two children. In May, 1901, the applicant met with an accident in the course of his employment, the result of which was that he lost the top joint of one finger and injured another. In the following August an award was made in his favour under the Act for a weekly sum of 18s. 6d. In May, 1903, the appellants applied to the County Court Judge under schedule 1 of the Act to review the award by terminating or diminishing the weekly payments on the ground that since the accident the applicant had set up in business as a baker, at which he was said to be earning money. The County Court Judge, after hearing evidence, reserved his decision as to whether the earnings of a trade business could be treated as "earnings" within the meaning of schedule 1, paragraph 2, of the Act, and he came to the conclusion that according to the true construction of the schedule wage-earning capacity alone was to be taken into account. The County Court Judge said it was difficult to say what proportion of the total earnings in the business ought to be treated as the applicant's own labour, but he estimated the total earnings in the business at 2*l.* a week. That, he thought, was immaterial as compensation to a workman, for personal injury was in his opinion clearly assessable with reference to weekly wages or earnings earned before the injury, and weekly earnings or wages earned after the injury, and he thought that trade profits in a business were no more to be taken into account than income of real estate. He, therefore, dismissed the application with costs. Hence the present appeal.

At the conclusion of the arguments of counsel, the Master of the Rolls, in giving judgment, after stating the facts, said he thought the County Court Judge had taken much too narrow a view of the construction of the Act. The County Court Judge had not found with any exactness the portion of the profits attributable to the applicant as the earnings arising from his exertions, as he had held that it had nothing to do with the discussion of the matter before him, and that, unless the employers could show that that which the workman had received after the accident was "wages" paid by an employer, the amount of any such earnings had no relevancy to the discussion. In his lordship's opinion, paragraph 2 did not in terms exclude earnings other than those earned from an employer. He was of opinion that the appeal must be allowed, and that the case must be then remitted to the County Court Judge to be considered on all its merits.

The Lords Justices concurred.

Mr. Arthur Powell, K.C., and Mr. Addington Willis appeared for the appellants; and Mr. Stuart Bevan for the applicant (the respondent on the appeal).

BRICKLAYER'S DEATH BY LIGHTNING.

THE case of Mary Andrew *v.* Failsworth Industrial Society, Ltd., came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, on the 13th inst., on the appeal of the defendants from a decision of the Judge of the Oldham County Court, who held that the applicant was entitled to recover compensation under the Workmen's Compensation Act for the loss of her husband, a bricklayer, who was killed by lightning while engaged in work on some buildings which were being erected by the defendants. In support of the appeal, it was contended that the man's death was not caused by an accident arising out of his employment within the meaning of the Act.

The Master of the Rolls, without calling upon counsel for the applicant, in giving judgment, said it was a perfectly clear case, not *primâ facie* in itself, but from the extremely lucid judgment of the County Court Judge, who had distinguished between the law and the facts, and pointed out how he arrived at his decision. The learned Judge had properly stated the law in regard to the matter when he said that if he came to the conclusion that the position in which the man was employed was dangerous, and that in consequence of that dangerous position the accident occurred, he would be entitled to hold that the accident arose out of the employment. The Judge had come to the conclusion that in the position in which the man was working he would be exposed to an abnormal risk of being struck by lightning, and it seemed to him (the Master of the Rolls) that there was ample evidence to justify that finding. For these reasons the appeal failed.

The Lords Justices concurred, and the appeal was accordingly dismissed with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

8,863 of 1903.—J. HULL and B. HILL: *Window Sash Fastener.*

This relates to window sash fasteners of the kind in which a bar, pivoted to one sash, swivels across the other, usually into a catch or detent device, by which the interlock is sufficient to prevent a vertical movement on the part of either sash. An ordinary swivel bar is pivotally mounted on the transome bar of one sash, usually the upper and outer sash, corresponding to which a plate on the transome bar of the other sash is mounted. The knob usually provided on the swivel bar by being riveted thereto, or otherwise made integral therewith, is, for the purpose of the invention, fitted into a hole bored through the end of the swivel bar, and is furnished with a thread to screw into a hole tapped in the plate on the other bar, which is made wider and thicker for this purpose. A shoulder on the knob screw to flange up against the swivel bar enables the knob screw to screw all tight together, thereby preventing all jar in the window sashes.

9,903 of 1903.—I. C. WALLAS and J. WARD: *Means applicable for use in Supporting Pipes or Radiators for Heating or other purposes.*

A support, comprising two members constructed in such a manner as to permit of the member carrying the pipes or radiators being adjusted altitudinally, and a standard furnished with a detachable hanger or carrier which is capable of vertical adjustment.

10,291 of 1903.—D. FOULIS: *Means for Opening and Closing Sliding Doors, Lids, Shutters, Ventilators, and the like, particularly applicable to the Doors of Poultry Houses, Coops, Kennels, Cages, and the like for birds and other animals.*

This consists in opening and closing, rising and falling of doors, lids, or shutters of poultry houses, coops, kennels, cages, ventilators, and the like for birds and other animals, by providing a pendant retaining arm revoluble upon a horizontal axis carried on a stationary part of the structure, a loop or loops, formed in the said retaining arm, and an outwardly inclined tail portion below such loop, in combination with a ratchet-shaped tooth, fixed upon the door or moving part and having a downwardly inclined upper surface, so that upon the door being lifted the moving part or the tooth acts upon the tail of the arm to raise same until the tooth enters the loop and the door is held, while the upper inclined edge of the tooth is calculated upon the further raising of the door to act upon the upper part of the loop, and the arm is thrown out about its fulcrum and permits the door to descend.

388 of 1904.—E. GOGLER and H. SEINFELD: *A Process for Manufacturing White Cement.*

A process for manufacturing white cement in which materials containing lime or silicic acid, or lime, sand, or pure silicic acid, either in their natural state or after having been burned, are mixed with a quantity of alkaline carbonates, the amount of which may vary from an amount equal to the weight of the silicates contained in the mixture to three times its weight, then melted, and the resulting mass lixiviated and dried with the object of obtaining, without being obliged to resort to the employment of too great a heat, a pure white cement which is distinguished by its hardness and does not decrease in bulk when in the water.

2,828 of 1904.—H. G. BRUNCKHORST: *A Method of Making Walls, Movable Partitions, and the like.*

A method of making walls, movable partitions, and the like, according to which horizontal and vertical or other suitably arranged wires are interwoven and drawn taut, and fabrics or other suitable material drawn through the meshes so formed, after which the partition may be finished.

13,616 of 1903.—G. P. CAMPBELL: *Process for, and Apparatus for, Manufacturing Building Blocks, and the like.*

The process consists in well mixing together a quantity of slaked lime and sand, afterwards putting same into a mould so constructed as to make the block hollow as required, then subjecting the mixture to pressure, and afterwards removing the block from the mould and piling a number of such blocks upon a platform waggon and subjecting the whole to the action of high pressure steam in a closed chamber for about ten hours, after which time the blocks may be withdrawn and are ready for use.

27,031 of 1903.—J. H. PINNOCK, P. C. RUSSELL and O. E. SEELEY: *Means for Promoting Ventilation.*

A means for use in promoting ventilating the interior of a building provided with a window opening, having at its upper part a sash adapted to be slidden downward to open communication at that part between the exterior and interior, the said means consisting essentially in the arrangement of a baffle across the upper part of such a window opening and extending downwardly parallel or approximately parallel to the face of the sash and at some little distance therefrom on its exterior side. The construction and arrangement of the said baffle being such that very little or no light is obstructed thereby, and when the said sash is lowered to a certain extent air cannot pass to the exterior in any appreciable quantity by way of the opening so formed above the lowered sash except through the space between the baffle and the exterior face of the sash, into which space it is difficult for outside currents of air to enter.

10,413 of 1903.—G. A. POLSON: *Automatic Fire Alarms.*

An automatic fire alarm, comprising contact spring arms, normally held apart by means of wires, or the like, the said wires being arranged to separate upon the temperature exceeding a certain limit so as to cause the contact arms to come together and make electrical contact.

10,516 of 1903.—A. E. WOOD and A. E. BLIZZARD: *Means for Supporting Tiles in Position during Firing.*

The object of this invention is to provide a support for tiles to take the place of saddles, props, and thimbles, in order that the tiles may be held more securely in their position and that a greater number of tiles may be placed in a given space of the oven or kiln. The support is in the shape of a rectangular parallelopiped of length somewhat less than the side of a tile of breadth a little greater than twice the thickness of a tile and any convenient thickness. Each support has two or more holes tapered and square in cross section carrying plugs. These plugs project below the support and keep the faces of the two tiles on which the support rests apart. The support may have a ridge at each end of its upper and lower faces so as only to come in contact with the tiles along this ridge.

10,744 of 1903.—W. J. CLEMSON: *Foundations for Windmill, and other Towers.*

This consists of a basework comprising a strong centre piece rigid with horizontal arms and adapted to receive a single mast, or in constructional towers each of the uprights, said arms being sufficiently long to take foundation bolts, feet, or the like.

26,908 of 1903.—T. P. HUGHES: *Bolts for Doors, and the like.*

In bolts for airtight compartments, cupboards, and the like, the combination of two oppositely and simultaneously moving bolts, whose inner ends are connected to a rotating device operated by a handle or key.

3,194 of 1904.—S. D. NAYLOR and J. P. JACKSON: *Door Latch.*

This consists in the combination in a door latch, or the like, of an inclined or faced tooth on the handle bar acting through a slot in the sliding latch in such a manner that the catch is opened or closed by simply pushing or pulling the door knob or handle horizontally instead of turning, or partially turning, the same.

3,676 of 1904.—H. H. LAKE (Gebruder Braun): *Manufacture of Cement and like Pipes.*

Process for the manufacture of stone asphalt pipes, characterised by the fact that pipes are made of cement and powdered slag, or the like, with surfaces as rough as possible and treated internally with a mass of highly-heated asphalt and externally with finely-powdered coke, for the purpose of obtaining an exceedingly penetrating impregnation with smooth inner, and rough outer, surfaces.

27,452 of 1903.—W. A. FRITZ: *Combined Apparatus for Mixing Cement, Mortar, and the like, and for Hoisting or Elevating Materials for use in Building Operations.*

This consists in the combination with a frame having leg standards, of a receptacle rotatably mounted thereon, elevating means including block and tackle connected to the frame, a pulley carried by the frame and engaged by the tackle for rotation thereby, a counter-shaft carried by the frame, and drive connections between the pulley and the counter-shaft, and also between the counter-shaft and the receptacle.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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8,003 of 1903.—H. HAWGOOD: *Hinges.*

The hinge is made of three parts, the centre one of which is jointed on either side, one side attached to the post plate and the other to the door plate. A hole is made through the three plates through which a roller chain passes, and into tubes attached to the back of the post and door plates wire spiral springs are inserted, through which also the chain passes. At both ends of the chain a stop is fixed to draw the springs against the plates while the door is opening either way, and for keeping the door closed when not in use. The door plate has a wing attached on either side to clip and strengthen the stile of the door where the tube is inserted. One or more of these chain actions can be used to each hinge.

10,036 of 1903.—P. E. GARDNER: *Chimneys, Chimney-pots, Ventilating Shafts, and the like.*

A chimney-pot, ventilating shaft, or the like, having, suitably mounted or suspended within it, a plate which may either hang vertically or which is capable, under the influence of the wind acting upon its exposed part, of closing the chimney or shaft on the downward side and leaving it open on the leeward side.

10,367 of 1903.—T. J. PALMER: *Manufacture of Moulded or Embossed Panels, and the like.*

The manufacture of moulded or embossed panels, or the like, by taking millboard forming material and applying the pressure necessary to make it into millboard by means of plates or rollers, or a plate and a roller, one of which is, or both of which are, formed for embossing or moulding whilst exerting the requisite pressure for making the millboard.

10,427 of 1903.—E. E. M. MITCHEL: *Walls of Tents, Huts, and the like.*

A wall for tents, huts, and the like, consisting of a series of curtains of canvas, or the like material, each arranged to slide on one of a series of rods or wires which are arranged in parallel vertical surfaces or in the same vertical surface and at different heights.

10,461 of 1903.—A. E. G. BROMELL and D. LEGG: *Window Catches, and the like.*

The window catch is constructed with a projecting lip on a compressing piece connected to a flat bracket or projection on each side, which is connected to one or more bolts with a spring on each side of the casing attached to a pin at the bottom of the case, or in any other convenient place. Connected to each bracket of the compresser is a stud which is connected to a bolt or bolts by a connecting link or links with a slot in the centre. In this slot and connected to the casing is a pivot so placed that when pressure is applied to the compresser, the connecting link or links between the compresser and the bolt working round this pivot withdraws the bolt or bolts by one movement. When pressure is taken off the compresser, the spring or springs, being suitably placed, force the bolt or bolts into the window sash and rack or other convenient place, and so effectually holds the window in any desired position in the window frame.

10,966 of 1903.—R. PENDLEBURY: *Means for Securing Door Knobs to Lock Spindles.*

The invention consists in the method of fixing the knob to the end of the square bar which passes through the lock. Inside the knob a brass or other metal square bush is mounted, and, having a square holt through it, is inserted from the side nearest the lock, the hole in the bush being the same size as the bar at the end nearest the lock and a little larger at the end furthest from the lock. The bar has a hole drilled in its end in the direction of its length about 1 in. deep, and adapted to receive a screw. For about ½ in. from the end of the bar each flat side has a slit cut into it, in the direction of the length of the bar. The knob is pushed on to the end of the spuare bar to the required position, then the screw with the conical head is passed through a hole in the knob and so enters the end of the bar. When screwed tight the conical part of the screw expands the end of the bar, the slits in the bar allowing this expansion to take place and so fill the larger end of the square hole in the bush, and thus form a dovetail which prevents the knob from being drawn off the bar.

11,359 of 1903.—J. W. KNIGHT and W. DRAKE: *Method of Making Concrete Slabs or Blocks and Apparatus Therefor.*

A method of manufacturing concrete slabs or blocks, consisting of separately pressing or ramming sufficient moistened material of which the concrete is composed in a mould, to consecutively form a number of slabs or blocks one above the other, said slabs or blocks being divided by metallic or other sheets for facilitating separation thereof when the mould is inverted and removed and the slabs or blocks have set or hardened.

23,562 of 1903.—F. SCHAUMBURG: *Machine for Making Grooved Blocks from Prepared Lengths, and for Feeding the Blocks into the Magazine of a Machine for the Manufacture of Mosaic Parquetry Slabs.*

A machine for making grooved blocks from prepared rectangular lengths for the manufacture of parquetry slabs, comprsing a conveyor which carries lengths twice past each of two saw shafts for grooving the lengths, and then past a saw shaft for cutting up the lengths between every two peripheral groovings, whereby the four sides of the lengths are grooved by means of only two saw shafts.

26,343 of 1903.—R. W. H. RODNEY: *Window Sash Fastener.*

This invention is an improvement on the class of fasteners made in two portions, one of each of which is secured to each sash, and in connexion with which there is no spring attached to the hook or hasp. The latter when turned into engaging position is held there by the weight of a solid sliding sleeve, whose weight may be, however, augmented by a spring pressure. In making this sash fastener, two plates are cast and pierced with two screw holes on either side their central boss and from the surface. To the central boss of one a hook is pivoted made with a stop to limit its movement to 90 degrees, and to the other boss a vertical plain pin is fixed with a head having first threaded on a small spiral spring and a heavy solid sleeve of cylindrical shape, whose lower end is parallel and fits exactly into and through the inner diameter of the hook when closed and touches the plate boss.

437 of 1904.—E. M. EDWARDS: *An Arrangement for Securing Tiles to Stoves, Grates, and the like.*

This consists of a casing for holding tiles, which are required to be fixed to stoves, grates, kitcheners, sanitary appliances, lavatory stands, bath casings, furniture, and the like, and is to be secured in its position by one or more springs or fixing pieces.

1,774 of 1904.—J. KOHOUSEK: *Key-hole Guards or Closing Devices.*

A key-hole closing device, consisting of a small safety lock, corresponding in shape to that of the key-hole to be closed, said lock comprising a bolt provided with a latch adapted to be withdrawn into the bolt, and, upon being advanced by means of a slide or disc in the interior of the safety lock operated by the bit of the key of the safety lock, to engage behind the cover plate of the door lock casing, while a pin on the safety lock casing may engage with the key-hole plate of the door lock casing, thus preventing the key-hole closing device from being turned.

1,890 of 1904.—A. KURZWERNHART: *Siemens' Regenerative Furnaces.*

A method of avoiding loss of gas in Siemens' regenerative furnaces, wherein, before the reversing operation, the gas contained in the regenerative chamber and in the passages connected therewith, is forced into the furnace by air which, after the gas has been cut off in a known manner, is introduced through a lateral opening.

2,447 of 1904.—C. GIELOW and B. ALEXANDER-KATZ: *Edge Runners and Pans.*

An edge runner and pan, consisting of a stepped grinding surface and stepped runners whose part having the material conducted to it first is at the greatest distance from the grinding surface, and whose part acting upon the material last bears upon the grinding surface.

2,843 of 1904.—H. CARDON: *Apparatus for Making Combined Wire and Wood Fencing.*

An apparatus for making combined wire and wood fencing, consisting of a pair of guide arms pivotally mounted at the forward end of the twisting mechanism, the ends of which are arranged to be brought close together and held in that position by means of a pair of parallel bars operated by a lever.

3,769 of 1904.—F. W. HOWORTH (F. Jurschina): *Manufacture of Artificial Stone.*

The manufacture of artificial stones, ornaments, figures, and the like, which consists in mixing cement, a solution of soda-silicate (water glass), clay, and sand, a powdered porphry, basalt, or granite, the clay being dissolved or suspended in the water-glass solution before the aforementioned substances are mixed together, for the purpose of saturating the clay thoroughly with the water-glass solution, maintaining the strength in degrees Bé of the latter at a constant amount during the working operations, preventing an evaporation of the water from the water-glass solution during the subsequent burning of the ware, which, in consequence of the retardation of the setting or binding, does not become burnt or slagged.

6,202 of 1903.—R. WILKE: *Means for Altering the Direction of Motion of Cranes and other Large Structures.*

A device for altering the direction of motion of cranes, travelling stages, or the like, moving on tracks, comprising in combination the arrangement that the wheels or groups of wheels are pivoted on vertical pivots, and that at each crossing point or branch-off point each rail of the track is provided with a separate turntable for altering the direction of the wheel or group of wheels resting upon it.

6,247 of 1903.—J. H. MAGENS: *Treatment of Concrete, and the like, whereby the Setting of the same after Mixture may be Arrested.*

A process for storing ready-mixed cement concrete, cement, concrete cement mortar, and the like, without impairing its setting or binding power, in which the cement concrete, etc., is, immediately after its being mixed, cooled to, or nearly to, its freezing point and afterwards maintained in such frozen state till it is used.

7,762 of 1903.—J. W. BATEMAN: *Fire Escape Life-saving Apparatus.*

This invention relates to a load-lowering device, more particularly applicable for use as a fire escape and life-saving apparatus, and has for its object to provide an apparatus which can be instantly fixed in position ready for lowering a load or for lowering persons from the various floors of a building. According to this invention, two jaws are provided for the purpose, for example, of application over the window sill, the jaws being of such length as to extend downwardly respectively on the exterior and the interior of the wall. A screwed rod or spindle is provided, one end of which is carried by one of the jaws, while the other passes through the other jaw, and is provided with an adjusting device by means of which the ends of the jaws may be brought together so as to engage with the wall, and thus be firmly and securely fixed in position.

7,338 of 1903.—R. W. NEWLANDS: *Protractors and the like.*

This consists in constructing apparatus for rapidly and accurately taking and indicating angles from two-hinged members in combination with a marked loose bisecting strip, which strip has a pivotal connexion with the end of one member when used for indicating the angle, and indicates the angle of the hinged members by placing one edge against a pin on the end of the other member.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 29.—By DEBENHAM, TEWSON, & CO.

Bloomsbury.—39, Bloomsbury-sq., u.t. 27½ yrs., g.r. 20*l.*, p.	£2,200

By FISHER, STANHOPE, & DRAKE.

Stoke Newington.—73, Lordship-rd., and ½ an acre, u.t. 38½ yrs., g.r. 8*l.* 10s., p	795

By MCINTOSH & CO.

Old Kent-rd.—21 to 29 (odd), Earl-rd., u.t. 16½ yrs., g.r. 15*l.*, w.r. 182*l.*	725
Lambeth.—100 and 102, Waterloo-rd. (s.), u.t. 18½ yrs., g.r. nil, y.r. 154*l.*	1,310
Peckham.—Hook's-rd., "The Duke of Cambridge," p.h., f.g.r. 5*l.*, reversion in 49 yrs.	265

By MORGAN, BAINES, & CLARK.

Holmwood, Surrey.—Thurban's-hill, freehold building site	100

By A. H. TURNER & CO.

Hampton Wick, Middlesex.—"Cambridge House," and about 1 acre, f., p.	2,700

By FREDK. WARMAN.

Canonbury.—6 and 8, Canonbury-st., u.t. 41 yrs., g.r. 15*l.*, y.r. 84*l.*	905
32, Pyrland-rd., u.t. 45 yrs., g.r. 6*l.* 6s., y.r. 47*l.* 10s.	445
Muswell Hill.—3, Lancaster-villas, u.t. 93½ yrs., g.r. 12*l.* 12s., e r. 70*l.*	650
Canonbury.—17, St. Mary's-rd., u.t. 41 yrs., g.r. 2*l.*, e.r. 65*l.*	650

March 30.—By JOHN BOTT & SONS.

Brixton.—62, Saltoun rd., u.t. 69 yrs., g.r. 6*l.* 6s., w.r. 65*l.*	420
22 and 24, Lynham-rd., u.t. 22½ yrs., g.r. 5*l.*, w.r. 44*l.* 4s.	210
Norwood.—65 and 67, Dunbard-st., u.t. 59 yrs., g.r. 5*l.* 12s., w.r. 41*l.* 12s.	170
Dulwich.—17, 19, and 21, Clive-rd., u.t. 48 yrs., g.r. 8*l.*, w.r. 58*l.* 1s. 4d.	320
Herne Hill.—197 and 199, Norwood-rd., f., y.r. 84*l.*	980

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62 and 68, Stanhope-st., u.t. 17 yrs., g.r. 4*l.*, w.r. 171*l.* 12s.	620
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28, Clarence-gdns., u.t. 19½ yrs., g.r. 18*l.*, w.r. 78*l.*	200

By DOUGLAS YOUNG & CO.

Clerkenwell.—29, Red Lion-st., f., y.r. 50*l.*	800
Battersea.—63 and 65, Queen's-rd. (s.), u.t. 73 yrs., g.r. 18*l.* 18s., y.r. 129*l.* 2s.	1,000
Clapham.—16, Studley-rd., u.t. 20 yrs., g.r. 5*l.*, y.r. 40*l.*	300

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By G. LOVEITT & SONS (at Nuneaton).
Nuneaton, Warwick. — Bridge-st., "Bridge House," with malthouse, area 727 yds., f., p. £2,000

March 31.—By BACH & SMITH.
Paddington.—358, Harrow-rd. (s.), u.t. 59 yrs., g.r. 11*l.*, y.r. 105*l.* 1,585
69, Amberley-rd., u.t. 58¼ yrs., g.r. 7*l.*, y.r. 50*l.* 390
Clapham.—151a, Clapham-rd., f., y.r. 50*l.* 800

April 7.—By FIELD & SONS.
Bermondsey.—29, Drummond-rd., u.t. 30 yrs., g.r. 3*l.* 10s., w.r. 41*l.* 12s. 245

By BATCHELAR & SON (at Croydon).
Croydon.—74 to 80 (even), Leighton-st. East, f., w.r. 61*l.* 2s. 640
99, Queen's-rd., f., w.r. 28*l.* 12s. 295
4 and 6, Bridge-pl., f., w.r. 32*l.* 10s. 290
2, Bridge-ter., f., w.r. 13*l.* 120
64, Cross-st., f., w.r. 16*l.* 18s. 165

April 8.—By A. PREVOST & SON.
Stepney.—69, Shandy-st. (dairy premises), u.t. 13 yrs., g.r. 22*l.*, e.r. 94*l.* 18s. 150

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, APRIL 15.

Institution of Mechanical Engineers.—Paper to be further discussed: "Compound Locomotives in France," by M. Edouard Sauvage, Chief Consulting Engineer, Western Railway of France. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—7 p.m.

SATURDAY, APRIL 16.

Royal Institution.—Mr. Cyril Davenport, F.S.A., on "Mezzotints." 3 p.m.

MONDAY, APRIL 18.

Royal Institute of British Architects.—Mr. E. S. Prior on "The Statues of Wells Front, with some Contemporary Foreign Examples of Sculpture," illustrated by lantern views. 8 p.m.

Surveyors' Institution. — Mr. Thomas Blashill on "London Streets and London Street Traffic." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—7 p.m.

Liverpool Architectural Society. — Annual General Meeting. 6 p.m.

TUESDAY, APRIL 19.

Institution of Civil Engineers.—Mr. J. M. Henderson on "Aerial Suspension-Cableways." 8 p.m.

Society of Arts (Applied Art Section).—Mr. Alfred East, A.R.A., on "The Sentiment of Decoration." Mr. Walter Crane, R.W.S., will preside. 8 p.m.

Builders' Clerks' Benevolent Institution. — Twenty-sixth Annual Dinner, King's Hall, Holborn Restaurant. 6 p.m.

Dundee Institute of Architecture.—Mr. James Adamson on "Music and Art in Renaissance." 8 p.m.

WEDNESDAY, APRIL 20.

British Archæological Association.—(1) Mr. R. E. Leader, B.A., President, on "Sheffield Cutlery and the Poll Tax of 1379." (2) Mr. A. Denton Cheney, F.R.Hist.Soc., on "Shepway Cross." 8 p.m.

Society of Arts.—Mr. Mervyn O'Gorman, M.Inst.E.E., on "Motor Cars for Popular Use." 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers). — (1) Inspection at Harrison and Barber's Knacker Yard, Winthrop-street, Whitechapel, E. 3 p.m. (2) Lecture by Dr. E. P. Manby. 7 p.m.

Edinburgh Architectural Association.—Annual Business Meeting and President's Valedictory Address. 8 p.m.

Institute of Sanitary Engineers, Ltd.—Extraordinary General Meeting. 4.30 p.m.

Builders' Foremen and Clerks of Works' Institution.—Quarterly Meeting of the Members. 8 p.m.

THURSDAY, APRIL 21.

Royal Institution.—Professor Dewar on "Dissociation," II. 5 p.m.

Society for the Encouragement of the Fine Arts.—Paper by Sir Wyke Bayliss, P.R.B.A., F.S.A., entitled "In the House of Her Friends" (art in relation to the sanitary condition of our great cities). Sir W. B. Richmond, K.C.B., R.A., in the chair. 8 p.m.

Institution of Civil Engineers (Special Meeting).—The Twelfth "James Forrest" Lecture ("Internal Combustion Motors"), by Mr. Dugald Clerk, M.Inst.C.E. 8 p.m.

FRIDAY, APRIL 22.

Architectural Association.—Mr. W. Gilbert on "Craftsmanship." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. P. Manby on "The Hygiene of Byres, Lairs, Cowsheds, and Slaughter-houses." 7 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. A. Trewby, B.A., on "No. 2 River-Pier of the Beckton Gasworks." 8 p.m.

SATURDAY, APRIL 23.

Architectural Association.—Visit to the New War Office Buildings, Whitehall. 2.30 p.m.

Royal Institution.—Mr. Cyril Davenport, F.S.A., on "Cameos." 3 p.m.

Incorporated Association of Municipal and County Engineers.—Eastern District Meeting at Great Grimsby.

Edinburgh Architectural Association.—Visit to Glasgow under the auspices of the Glasgow Architectural Association.

Sanitary Institute (Provincial Meeting at the Town Hall, Cardiff). — Discussion on "School Hygiene in connexion with the Duties and Responsibilities of the New Education Authorities," to be opened by Dr. E. Walford. The chair will be taken by Mr. W. Whitaker, Chairman of Council of the Institute. In the afternoon a visit will be made to the Isolation Hospital and Crematorium on Flat Holm Island.

TO CORRESPONDENTS.

J. E.—H. S.—J. W. R.—F. H.—S. W. P.—H. J. C.—H. H. N. (Below our limit).——J. A. H.—D. S. (Amount should have been stated).

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6 in. rubbed two sides ditto, ditto	2 6	,, ,,
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Scappled random blocks	3 0	per ft. cube ,,
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. ,,
6 in. rubbed two sides Ditto	3 0	,, ,,
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,, ,, ,, 3 in. do.	1 2½	,, ,,

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16 × 8 best blue Portmadoc	6 12 6	,, ,,
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20 × 12 ,, ,,	17 2 6	,, ,,
18 × 10 ,, ,,	12 10 0	,, ,,
16 × 8 ,, ,,	10 5 0	,, ,,
20 × 10 permanent green	11 10 0	,, ,,
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16 × 8 ,, ,,	6 10 0	,, ,,

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Best Red or Mottled Staffordshire do. (Peakes).....	51 9	per 1000 ,, ,,
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Hip tiles	4 1	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,
Best "Rosemary" brand plain tiles.....	48 0	per 1000 ,, ,,
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Valley tiles	3 8	,, ,, ,,
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000 ,, ,,
Do. pressed.....	47 6	,, ,, ,,
Do. Ornamental do	50 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 6	,, ,, ,,

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	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4.....	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in....	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in....	8 10 0	9 10 0
Foreign Sawn Boards—		
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.) ...	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOINERS' WOOD.

	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.....	18 10 0	20 0 0
,, ,, 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.....	18 0 0	19 10 0
Battens.....	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.....	14 10 0	16 0 0
Battens.....	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.....	13 0 0	14 0 0
Battens.....	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
,, ,, 3 in. by 9 in.	13 10 0	14 10 0
Battens.....	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
,, ,, 3 in. by 9 in.	12 10 0	13 10 0
,, ,, battens	9 10 0	10 10 0
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Oddments	24 0 0	26 0 0
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Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube .	0 3 6	0 5 0

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WOOD.—(*continued*).

JOINERS' WOOD (*contd.*).	At per standard. £ s. d.	£ s. d.
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Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks—per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

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Rolled Steel Joists, ordinary sections	6 5 0 ...	7 5 0
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	Per ton, in London. £ s. d.	£ s. d.
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Common Bars	7 5 0 ...	7 15 0
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Mild Steel Bars	8 15 0 ...	9 5 0
Hoop Iron, basis price	9 5 0 ...	9 10 0
,, ,, Galvanized	17 10 0 ...	—

('And upwards, according to size and gauge.)

Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ...	—
,, ,, 24 g.	10 15 0 ...	—
,, ,, 26 g.	12 5 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ...	—
Ordinary sizes to 22 g. and 24 g.	13 5 0 ...	—
,, ,, 26 g.	14 5 0 ...	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ...	—
,, ,, 22 g. and 24 g.	16 10 0 ...	—
,, ,, 26 g.	18 0 0 ...	—
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0 ...	—
,, ,, 22 g. and 24 g.	13 0 0 ...	—
,, ,, 26 g.	13 15 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0 ...	—
,, ,, ,, 26 g.	14 0 0 ...	—
Cut nails, 3 in. to 6 in.	9 0 0 ...	9 10

(Under 3 in., usual trade extras.)

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	Per ton, in London £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	15 0 0 ...	—
Pipe in coils	15 10 0 ...	—
Soil pipe	18 0 0 ...	—
Compo pipe	18 0 0 ...	—
ZINC—Sheet—		
Vieille Montagne ....ton	26 5 0 ...	—
Silesian	26 0 0 ...	—
COPPER—		
Strong Sheet....per lb.	0 0 10½ ...	—
Thin ,, ,,	0 0 11½ ...	—
Copper nails ,,	0 0 11 ...	—
BRASS—		
Strong Sheet ,,	0 0 10 ...	—
Thin ,, ,,	0 0 11 ...	—
TIN—English Ingots ,,	0 1 4 ...	—
SOLDER—Plumbers' ,,	0 0 6½ ...	—
Tinmen's ,,	0 0 8 ...	—
Blowpipe ,,	0 0 9 ...	—

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32 oz. thirds	4d. ,, ,,
,, fourths	2⅝d. ,, ,,
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,, ,, ,, in drums	,,	0 1 9
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Turpentine, in barrels	,,	0 3 7
,, in drums	,,	0 3 9
Genuine Ground English White Lead	per ton	19 0 0
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Best Linseed Oil Putty	per cwt.	0 7 6
Stockholm Tar	per barrel	1 12 0

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	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
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Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

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ABRAM (Lancs.).—For the supply of road materials, for the Urban District Council. Mr. J. Eatock, Surveyor to the Council. Quantities by the Surveyor:—
Setts.
T. C. Catterall, Adlington, near Chorley £417
Kerbs.
J. Southworth, Withnell, near Chorley .. 39
Ballast.
J. Southworth, Withnell, near Chorley .. 43

AUDENSHAW (near Manchester).—For the erection of forty-four dwelling-houses at Stamford-road, etc. Messrs. J. H. Burton & J. A. Percival, architects, 150A, Stamford-street, Ashton-under-Lyne:—
General Trades.
Z. Pike & Son, Hooley Hill* £7,405
[Twenty tenders received.]
Plumbing and Glazing.
H. Pike, Hooley Hill* £636
[Twenty-two tenders received.]

BARGOED.—For conversion, with extensions, of Nos. 80, 81, and 82, Cardiff-road, into business premises surgery, etc., for Dr. E. R. Bowen, M.D. Mr. P. Vivian Jones, architect, Hengoed:—
Vodden & Lee, Gilfach, Bargoed, viâ Cardiff* £800

BEACONSFIELD.—For new hotel and stabling at Beaconsfield Station, for Messrs. Weller. Mr. Arthur Vernon, architect, 9, Strand, Charing Cross, London, W.C., and High Wycombe, Bucks.:—

J. K. Cooper & Sons	£3,097 0	F. G. Rust	£2,832 14
G. Darlington ..	3,060 0	C. H. Hunt & Son	2,593 0
Webster & Cannon	2,888 0	J. Mead	2,585 0
Y. J. Lovell	2,845 0	H. Flint	2,493 0
		G. H. Gibson ..	2,437 0

BEDLINOG.—For erecting twenty houses, for the Bedlinog Building Club. Mr. P. Vivian Jones, architect, Hengoed:—
W. Watts, Brynbenlog, Dowlais* £4,100

CARDIFF.—For the erection of the superstructure of a new pavilion in the Cardiff Arms Park, for the Joint Committee of the Cardiff Cricket and Football Clubs. Messrs. Veall & Sant, architects, Cardiff:—

Boulton & Paul.	£2,135 0	Knox & Wells	£2,010 0
H. Gibbon	2,100 0	Melhuish Bros.	1,989 0
Symonds & Co. .	2,064 14	Gibson Bros., Cardiff*	1,981 0
W. Harbrow	2,050 0		
W. Thomas & Co.	2,049 0		

CHELMSFORD.—For 657 yards of 3-in. c.i. water pipes, 48 yards of 9-in. ditto, etc., for the Rural District Council. Mr. J. Dewhirst, surveyor and engineer, Avenue-chambers, Chelmsford:—
Clay-cross Coal and Iron Co., near Chesterfield* .... £5 1 8 per ton for 3-in. pipes. 4 17 6 ,, ,, ,, 9-in. pipes. 9 0 0 ,, ,, ,, specials.
[Twelve tenders received.]

CHELMSFORD.—For the construction of a 9-in. stoneware and c.i. pipe sewer and laying water mains, for the Rural District Council. Mr. J. Dewhirst, surveyor and engineer, Avenue-chambers, Chelmsford:—

Moran & Co. ..	£768 0 0	J. Jackson	£555 7 9
J. Rayner	698 0 0	G. G. Rayner, Croydon*	495 1 0
F. Johnson	634 16 7		
Wilson, Border, & Co.	555 10 0		

CHELTENHAM.—For the supply of cement for making slabs, for the Borough Council. Mr. J. S. Pickering, Borough Surveyor, Municipal Offices, Cheltenham:—

	Per ton.
Sessions & Sons, Ltd.	£1 19 6
Costling & Co.	1 17 6
A. Knowles & Co.	1 17 0
Trechmann, Weeks, & Co., Ltd.	1 16 3
Rugby P.C. Co.	1 16 0
C. Nelson & Co., Ltd.	1 16 0
J. J. Lee	1 15 6
R. Stephenson & Son, Ltd.	1 15 0
Greaves, Bull, & Lakin	1 15 0
J. Board & Co., Ltd.	1 14 11
B. W. Pearce & Co., Ltd.	1 14 0
Bridgwater Portland Cement Co.	1 13 6
Kaye & Co., Ltd.	1 13 6
Powell, Gwinnell, & Co., Ltd.	1 13 5
B. J. Forder & Son, Ltd.	1 12 3
Aberthaw Portland Cement Manufacturers, Ltd.	1 12 0
South Wales Portland Cement & Lime Co., Ltd., Lower Penarth, nr. Cardiff*	1 12 0

CHIPPENHAM.—For rebuilding the Little George Inn, for Messrs. Wilkins, Bros., & Hudson. Mr. H. W. Matthews, architect, Institute-chambers, Terrace-walk, Bath. Quantities by architect:—

Parsons	£4,298 0	Mould Bros.	£4,030 0
Chancellor & Sons	4,295 0	Rudman	3,937 0
Erwood & Morris	4,256 0	Smith & Light, Chippenham†	3,798 17
Long & Sons	4,245 0	F. Carter	3,776 0
Wills & Sons	4,138 0		
E. Linzey	4,070 0		

CHIPPENHAM.—For the enlargement of the sorting office at Chippenham Station, for the Commissioners of H.M. Works and Public Buildings:—

		Credit Old Materials.
A. Wills & Sons	£1,698	£5 10
W. J. Bloxham	1,793	60 0
W. Light & Son	1,889	30 0
J. Long & Sons	1,967	28 0
Downing & Rudman	1,974	32 0
Stephens, Bastow & Co., Ltd.	1,995	—

CROSS KEYS.—For alterations, additions, and repairs to Eagle Inn, Cross Keys. Mr. E. N. Johnson, architect, Risca, Newport, Mon.:—

C. H. Reed	£375 0	J. Charles	£340 0
J. Jenkins	357 0	Leadbeter Bros.	311 17
E. C. Jordan	355 0		

DALMUIR.—For electric distribution at Dalmuir Outfall Works, for the Glasgow Corporation. Messrs. D. & H. Home Morton, C.E., 130, Bath-street, Glasgow:—
A. Low, 78, Merkland-street, Partick, Glasgow* £2,705 2 5

EASTBOURNE.—For improvements in Beltring-terrace, for the Highways and Drainage Committee. Mr. D. J. Bowe, Borough Surveyor, Town Hall, Eastbourne:—

Carrington & Russell	£197 0 0
M. Hookham	107 5 0
A. Hudson, Eastbourne*	105 0 0

EYEMOUTH (Berwick).—For the erection of public conveniences on quayside, for the Eyemouth Harbour Trustees and Eyemouth Town Council jointly. Mr. William Gray, architect, Ivy-place, Berwick-on-Tweed:—
H. Elliot & Sons, Berwick-on-Tweed.. £228 0
P. Edgar, Eyemouth 237 15

GREAT FLOAT (near Birkenhead).—For roof boarding and painting in connexion with erection of additions to purifier house at gasworks, for Wallasey Urban District Council. Mr. J. H. Crowther, Engineer:—
L. Lindfield, Hoylake £287

GRIMSBY.—For the erection of a twenty-stall stable, cart-shed, foremen's offices, etc., Middle Six Acres, Doughty-road, for the Household Scavenging Sub-Committee. Mr. H. Gilbert Whyatt, Borough Engineer and Surveyor, Town Hall-square, Grimsby. Quantities by Engineer:—

Waterman	£1,800 15 0
Hewins & Goodhand	1,740 0 0
Gilbert & Kirton	1,734 14 0
Cook, Grimsby*	1,699 12 0

HARROGATE.—For the construction of sewage purification works, Spofforth (Contract No. 3), for the Corporation. Mr. E. W. Dixon, Engineer, 5, Prospect-crescent, Harrogate:—
H. Arnold & Son, Doncaster* £17,104

HUDDERSFIELD.—Accepted for the erection of a house, out-offices, and boundary walls in Bradford-road North, Fartown. Mr. A. V. A. Lofthouse, architect, Fartown, Huddersfield:—

Mason and Bricklayer: M. Brook	£224
Carpenter and Joiner: Grant & Hughes	71
Plumber: H. Graham	39
Plasterer: D. Tunnacliffe & Sons	30
Slater: T. B. Tunnacliffe & Sons	17
Iron Work: D. Haigh	10
Concreter: J. E. Dyson	9
Painter: S. Kendall	8

[All of Huddersfield.]

LLANTWIT FARDRE.—For sewerage works at Church Village and The Stank, for the Llantrisant and Llantwit Fardre Rural District Council. Mr. Gower S. Morgan, Engineer, School-street, Pontyclun:—

Price Bros.	£2,021 16 0	F. Ashley	£1,652 17 11
Lewis & Morgan ..	1,958 16 0	G. Rutter ..	1,640 3 3
R. J. Mathias	1,847 2 8	Burton & Ringham..	1,596 16 10
D. W. Davies	1,810 0 0	J. E. Evans, 233, Inverness-place, Cardiff* ..	1,553 0 0
Barnes, Chaplin, & Co...	1,805 9 7		
J. Morgan ..	1,793 7 11		
H. S. Rendell	1,723 7 11		

[Engineer's estimate, £1,725.]

LONDON.—For the construction of a sewer, Porchester-gardens, for the Paddington Borough Council. Mr. E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W.:—
R. Ballard, Ltd., Child's Hill, N.W.* £357

TENDERS—*Continued on page* 425.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums	Designs to be Delivered
*Elementary School	Borough of Kingston-on-Thames ..	Not stated	April 21

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Gates & Wrought-Iron Fencing at Recreation Grounds	Manchester Corporation	City Surveyor's Office, Town Hall, Manchester	April 15
Boundary Wall, Whitworth-street Recreation Ground	do.	do.	do.
Gates and Fencing, Charlestown-road, Blackley	do.	do.	do.
Rebuilding the Grapes Hotel, Stoneferry	.....	T. B. Atkinson, Architect, 11, Trinity House-lane, Hull	April 16
Elementary School, Monk's-road, Lincoln	Education Authority	W. Watkins & Son, Architects, Silver-street, Lincoln	April 18
Roding & Cotting of Drains in the Black Sluice Level	Black Sluice Commissioners	F. S. Robins, Surveyor, 5, Horncastle-road, Boston	do.
Painting, etc., Shops and Cottages	Hayfield Co-operative Society	D. Mellor, Secretary	do.
Extension to Waterworks, including Reservoir	Tralee Urban Sanitary Authority	T. A. Casey, Board Room, Gas-terrace, Tralee	do.
Repair of Purifiers and Gasholder at Gasworks	Dundee Gas Commissioners	A. Yuill, Engineer, Gasworks, Dundee	do.
Hydraulic Hoist at Gasworks	do.	do.	do.
Steam Engines and Gas Exhausters, etc.	do.	do.	do.
Additions to House, Princetown-road, Bangor	Mr. S. Wilson	F. W. Lockwood, Architect, 18, Pakenham-street, Belfast	do.
Invalid Children's Carriage for Twenty-four	Bristol Education Committee	W. A. Adams, Sec., Educa. Office, Guildhall, Broad-street, Bristol	do.
Road at Foleshill Works	Gas Committee Coventry Corp.	F. W. Stevenson, Engineer, Gasworks, Coventry	do.
*Timber, etc., at Foleshill Works, for Two Acid Chrs.	do.	do.	do.
Machine Tools	Stalyb'dge, etc., Tramways, etc., Bd.	F. Schofield, Clerk Town Hall, Stalybridge	do.
Additions, etc., St. Andrew's Church, Llwynypia	Rev. R. W. Evans	T. W. Millar, Architect and Surveyor, Mountain Ash	do.
Materials	Bray U.D.C.	P. Mac Donnell, Clerk, Town Hall, Bray	do.
Terra-Cotta, Plym'th-gr. Mun. Sch., Chorlt'n-'-Medl'k	Manchester Education Committee	Deansgate Offices, Manchester	do.
Branch Store at Whitburn	Marsden Indus. and Prov. Soc. Ltd.	J. Hunter, Secretary	do.
Road-making, Cornwallis-road	Maidstone U.D.C.	T. F. Bunting, Borough Surveyor, Fair Meadow, Maidstone	April 19
Cast-Iron Water Pipes (Contract No. 4)	St. Andrews Town Council	W. Watson Burgh Surveyor, St. Andrews	do.
Widening Road between Cowbridge and Pontyclun	Glamorgan County Council	T. M. Franklen, Clerk, Westgate-st., Cardiff	April 20
Police Station, Senghenydd, near Caerphilly	Glamorgan Quar. Sess. Co. Council	do.	do.
Office and Shop Premises, Guiseley	Guisely and Yeadon Coal Co.	H. Chippendale, Architect, Guiseley	do.
*Making-up and Paving Road	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.	do.
Residence at The Barton, Hereford	Mr. H. Evans	Groome & Bettington, Architects, Palace-chambers, Hereford	do.
Town Hall and House	Audlem Public Hall Co.	R. Matthews, Architect, Parr's Bank-chambers, Nantwich	do.
One Surface Condenser, Pumps, etc.	Barrow-in-Furness Corporation	C. F. Preston, Town Clerk, Barrow-in-Furness	do.
One Electrically-driven Feed Pump, etc.	do.	do.	do.
Annual Contracts	Walton-on-Thames U.D.C.	R. Wilds, Engineer and Surveyor, Council Offices, Walton	do.
Stores for Sanitary Department	Glasgow Corporation	Peter Fyfe, Sanitary Inspector, 23, Montrose-street, Glasgow	do.
2¼ Miles of Roads and Paths, Cherryhinton	Chesterton R.D.C.	Waters & Worrall, Engineers, 2, Sidney-street, Cambridge	do.
Sewage Tank Ironwork (Duckpits and Altham Wks.)	Burnley Corporation	G. H. Pickles, Borough Surveyor, Town Hall, Burnley	do.
High Speed Engine, etc., at Portrane Aux. Asylum	Richmond District Asylum Com.	Asylum Offices, Grangegorman, Dublin	do.
Electric Underground Cable at the Richmond Asylum	do.	do.	do.
1,000 Tons of Gravel, Portrane Asylum	do.	do.	do.
Making-up Ardwick-road and Spencer-street	Swinton U.D.C.	R. Fowler, Surveyor, Council Offices, Swinton, near Rotherham	do.
Additions, etc., to Yackla Cottages, near Wenvoe	Mr. R. L. Bassett	J. Thomas, F.S.I., 17, Quay-street, Cardiff	do.
Mild Steel Gas, Water, and Steam Piping	East India Ry. Co.	C. W. Young, Secretary, Nicholas-lane, E.C.	do
Fencing Inchberry Public Hall	.....	Mr. Hunter, Orton	do.
Materials	Houghton-le-spring R.D.C.	D. Balfour, Engineer, Houghton-le-Spring, R.S.O.	do.
Making-up Roads	Chiswick U.D.C.	J. Barclay, Surveyor, Town Hall, Chiswick	do.
*Paving Works	Hammersmith Borough Council	Borough Surveyor, Town Hall, Hammersmith	do.
Making-up Holmwood-road	Enfield U.D.C.	R. Collins, Surveyor, Public Offices, Enfield	do.
Two Tenements, Robertson's Close	Edinburgh Town Council	Burgh Surveyor, City-chambers, Edinburgh	do.
Shops and Warehouses, Scott-street, Perth	Co-operative Society	Maclaren & Mackay, Architects, 56, George-street, Perth	April 21
Alterations to Stables at Sewage Farm, West-street	Crewe Town Council	G. Eaton Shore, Borough Surveyor, Crewe	do.
Inclined Retorts, Gaythorn Station	Manchester Corporation	G. Nickson, Gas Department, Town Hall, Manchester	do.
Iron and Steel Work for Inclined Retorts	do.	do.	do.
514,400 Hardwood Sleepers, Central S. African Ry.	The Crown Agent for the Colonies	Whitehall-gardens, S.W.	do.
Electric Light Installation, Woodside District Library	Glasgow Corporation	A. B. Watson, 189, St. Vincent-street, Glasgow	do.
Painting, etc., Police Station, Leeds	Leeds Corporation	City Surveyor's Office, Leeds	do.
Unclimbable Iron Fencing, Sunny Brow Rec. Ground	Gorton U.D.C.	Surveyor, Town Hall, Gorton	do.
Machinery Warehouse, Deal-street, Halifax	.....	J. F. Walsh & G. Nicholas, Architects, Museum-chambers, Halifax	April 22
Making-up Street, near Sydenham-buildings	Aston Manor Borough Council	G. H. Jack, Borough Engineer, Council House, Aston Manor	do.
Furniture, St. George's Temporary Council School, etc.	Gorton Education Committee	W. A. Clegg, Secretary, Town Hall, Gorton	do.
Enl'g'g Tab'rn'le (Eng.) Bap. Chap., Hannah-st., Porth	.....	D. W. Jones, 16, Cemetery-road, Porth	do.
Mission Church, Skewen	Rev. T. C. Phillips	J. Cook Rees, Architect, Neath	do.
Stores	Wallsend Corporation	Corporation Offices, Hugh-street, Wallsend	do.
Road Materials and Carting	Hambledon R.D.C.	G. Lintott, Cranleigh, & S. B. Hasell, Milford Godalming	do.
Twenty-five Houses at Griffithstown	Griffithstown Building Club	D. J. Lougher, Architect, Bank-chambers, Pontypool	do.
Stone	Hartshorne and Seals R.D.C.	G. Farmer, Clerk, Ashby-de-la-Zouch	do.
*Coastguard Signal Sta., etc., Seaham Harb., Durham	Admiralty	Works Dept., Admiralty Office, 21, Northumberland-avenue, W.C.	do.
*Foundations for Engine and Alternator	Bexley U.D.C.	Mordey & Dawbarn, 82, Victoria-street, S.W.	do.
Hardwood Planks for Paving	Hull Corporation	A. E. White, City Engineer, Town Hall, Hull	do.
Two Dwelling Houses, Shilbottle	Sir W. Church	M. Temple Wilson, Architect, Alnwick	do.
1,050 Tons of Blue Guernsey Granite	Romford U.D.C.	The Surveyor, Council Offices, Romford	do.
Materials	Cheltenham Corporation	J. S. Pickering, Borough Surveyor, Municipal Offices, Cheltenham	do.
200 Tons of Lime	Johnstone Town Council	R. C. Stevenson, Town Clerk, Johnstone	do.
Enlargement of Caerphilly Parish Church (Section 1)	Rev. C. L. Price	J. W. Rodger, 14, High-street, Cardiff	April 23
Painting Work at Botley and Rose Hill Cemeteries	Oxford Corporation	City Engineer, Town Hall, Oxford	do.
Stones, Gravel, and Chalk	Wantage R.D.C.	District Surveyor, East Ilsley	do.
Hauling Road Material	do.	do.	do.
Rebuilding the Cow and Snuffers Inn, Llandaff	Rhondda Valley Brewery Co., Ltd.	A. O. Evans, Architect, Pontypridd	do.
Steel Framework for Tramway Car Sheds	Wigan Corporation	J. Slevin, Borough Electrical Engineer, Bradford-place, Wigan	do.
Residence at Adam's Hill, Breinton-road, Hereford	Mr. E. F. Bulmer	Groome & Bettington, Architects, Palace-chambers, Hereford	do.
Temporary Structure, Cathays Park, Cardiff	Torrey-Alexander Mission	W. Beddoe Rees, A.R.I.B.A., 37, St. Mary-street, Cardiff	do.
700 Yds. Fireclay Piping, etc., nr. Addiewell Ry. St'n	Young's Paraffin, etc., Co., Ltd.	J. W. Anderson, Works Manager, Addiewell, N.B.	do.
Galvanised Iron House, Sligo Fever Hospital	Sligo R.D.C.	M. F. Conlon, Clerk, Court House, Sligo	do.
*Additions to Union Workhouse	Ludlow Union	W. W. Robinson, Architect, 10, King-street, Hereford	do.
Sewerage Works	Frome U.D.C.	F. W. Jones, Engineer and Surveyor to the Council	April 25
Storthes Hall Asylum	West Riding County Council	J. Vickers Edwards, County Architect, Wakefield	do.
Jewish Baths, Albert-grove and Leeds-terrace	Leeds Corporation	J. Lane Fox, Architect, Britannia-buildings, Oxford-place, Leeds	do.
Three Cast-Iron Railway Turntables	do.	R. H. Townsley, General Manager, Gas Offices, Leeds	do.
Cast-Iron Pipes, Retort Castings, etc.	do.	do.	do.
Stores	Pontypridd U.D.C.	P. R. A. Willoughby, Engr. & Surv., Council Offices, Pontypridd	do.
Metalling	do.	do.	do.
Sewerage Works, Newall	Otley U.D.C.	J. E. Sharpe, Engineer and Surveyor, Council Offices, Otley	do.
Diversion and Culverting Fallowfield Brook	Manchester Corporation	City Surveyor's Office, Town Hall, Manchester	do.
Cast-Iron Pipes, Derwent Aqueduct (Contract No. 3)	Derwent Valley Water Board	E. Sandeman, Engineer's Office, Bamford, near Sheffield	do.
Steel Girder W'k to Footbr'g over Canal, P'k Approach	Hanley Corporation	J. Lobley, Borough Engineer, Town Hall, Hanley	do.
Cleaning and Painting Station Buildings, Belfast	G.N. Railway Company (Ireland)	Office of District Engineer, Belfast	do.
*Paving Home Park Open Space	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford	do.
*W dening and Surface Draining of Scott's-lane	Beckenham U.D.C.	Council's Surveyor, Beckenham	do.
*New Bridge at Stanwell Hill	County Council of Middlesex	County Engineer, Middlesex Guildhall, Westminster, S.W.	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Stores	Dublin, Wicklow, & Wexford Ry. Co.	M. F. Keogh, Secretary, Westland-row, Dublin	April 26
*Erection of Free Library	Southall-Norwood U.D.C.	R. Brown, Architect, Public Offices, Southall	do.
Steam Motor Carriage	Secretary of State for India	Director-General of Stores, India Office, Whitehall, S.W.	do.
Additions, etc., Railway Inn, Cwmbran	Messrs. Buchan & Co.	T. Roderick, Architect, Clifton-street, Aberdare	do.
Rebuilding the Six Bells, Garndiffaith	do.	do.	do.
Rebuilding the Penywaun Inn, Rhymney	do.	do.	do.
Repairing, etc., Clarence Hotel, Brynmawr	do.	do.	do.
Flags for Graves at Cemeteries	Leeds Corporation	City Surveyor's Office, Leeds	do.
Three Tenements, Lancefield-street	Glasgow Corporation	J. M'Kissack & Son, Architects, 68, West Regent-street, Glasgow	do.
Tools and Stores	East India Railway Company	C. W. Young, Secretary, Nicholas-lane, E.C.	April 27
Electricity Stores	Wallasey U.D.C.	J. A. Crowther, Eng., Elec. Works, Seaview-rd., Liscard, Cheshire	do.
Granite	Thame U.D.C.	W. Parker, Clerk, 2, High-street, Thame	do.
Isolation Hospital, Northallerton	Urban and Rural District Council	W. Fowle, Clerk, Northallerton	do.
630 Super. ft. of Pavement Lights	Blackpool Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
2 Lancs. B'lers, Laundry Pl't, etc., N. Brunswick-st.	Guardians of North Dublin Union	J. O'Neill, Clerk, Boardroom, North Brunswick-street, Dublin	do.
*Tar Paving Playgrounds at Hafod, etc., Schools	Swansea U.D. School Board	School Board Offices, Cynevor-place, Swansea	do.
Three Cottages, Jordan-street, Buckfastleigh	Co-operative Society	A. Warren, Architect, Fore-street, Buckfastleigh	April 28
Rebuilding Wheatsheaf Inn at Grayswood, Whitley	Surrey Public House Trust Co., Ltd.	E. L. Lunn, Architect, 36, High-street, Guildford	do.
Road Materials	Bosmere and Claydon R.D.C.	J. S. Macgregor, Surveyor, Coddenham	do.
Church at Thurlstone, near Penistone	do.	W. Morton, Surveyor, 27, John-street, Sunderland	do.
*Public Underground Convenience	Hackney Borough Council	Borough Engineer, Town Hall, Hackney, N.E	do.
*Supply of Timber	Ordnance Survey	Ordnance Survey Office, Southampton	do.
*New Fire Mains, Hydrants, etc., at Workhouse	St. Mary, Islington, Guardians	W. Smith, Architect, 65, Chancery-lane, W.C.	do.
Police Station at Stamfordham	Northumberland County Council	J. A. Bean, County Surveyor, Moot Hall, Newcastle-on-Tyne	April 29
Court House, Bellingham	do.	do.	do.
2,800 Tons of Steel Pipes and Specials	Port Elizabeth Municipality	Davis & Soper, 54, St. Mary Axe, London, E.C.	do.
*Coastguard Station at Robin Hood's Bay, Yorkshire	Admiralty	Works Department, Admiralty, 21, Northumberland-avenue, W.C.	do.
*Coastguard Station at Whitby, Yorkshire	do.	do.	do.
Thirty Houses, Cork	Bexhill Corporation	W. H. Hill & Son, Architects, 28, South-mall, Cork	do.
1,250 Tons of Quartzite Macadam	Board of Public Works	G. Ball, Borough Surveyor, Town Hall, Bexhill	do.
Harbour, etc., Works, Liscannor, co. Clare	Royton and Crompton U.D.C.	H. Williams, Secretary, Office of Public Works, Dublin	April 30
Permanent Way (Section A)	Edinburgh and Leith Gas Comm'rs.	R. P. Wilson, Engineer, 66, Victoria-street, Westminster	do.
Works and Residence, Springhall-lane, Halifax	Sheffield United Gas Light Co.	C. B. L. Horsfall & Son, Architects, Lord-street-chambers, Halifax	do.
Dressed Buff-coloured Bldg. Stones, Gasw'ks, Granton	Sheppey R.D.C.	W. R. Herring, Engineer New-street Works, Edinburgh	May 2
*Erection of Workshops and Stores, Neepsend	New Windsor Town Council	Company's Engineer, Commercial-street, Sheffield	do.
Road Material	Leyton District Council	J. Copland, Clerk, Sheerness	May 3
Making-up Bourne-avenue	do.	Borough Surveyor's Office, Alma-road, Windsor	do.
*Furniture, etc., for Norlington-road School	Commissioners of H.M. Works, etc.	W. Jacques, Architect, 2, Fen-court, E.C.	do.
*Situ Concrete, etc., Paving, Norlington-road School	Essex Standing Joint Committee	do.	do.
*New Post Office, Woodford Green	Portsea Island Mutual Co-op. Society	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	do.
*Court Room, etc., Police Station, Southend-on-Sea	Swansea Harbour Trust	F. Whitmore, Architect, Chelmsford	May 4
Business Premises, Eastney-road, Portsmouth	Wallasey U.D.C.	G. E. Smith, Architect, 145, Victoria-road, North Portsmouth	do.
Parochial House at Drumsna	The Committee	Rev. T. Hourican, P.P., Drumsna, Ireland	May 5
Cranes, etc.	Sutton Coldfield Corporation	T. Strick, Clerk, Swansea	do.
Stores for Ferry Committee	Gelligaer County School Governors	Manager's Office, Egremont Ferry, Cheshire	May 9
*Enlargement, etc., of Church, Totland Bay	East Suffolk County Council	Percy Stone, Architect, Newport, Isle of Wight	May 14
*New Town Hall and Fire Brigade Station		Borough Surveyor, Council House, Sutton Coldfield	May 16
Heating New Boys' School at Pengam		R. S. Griffiths, Architect, Tonypandy	No date.
Broken Granite, Ragstone, and Flints	Gateshead Education Committee	H. Miller, County Surveyor, 16, Museum-street, Ipswich	do.
Plasterers' Wk, 3 pairs of Villas, North-la., Roundhay	A. Walkes	W. H. Lister, Architect, 5, Greek-street, Leeds	do.
Eight Cottages in Wyndway-road, Cardiff	U.D.C.	Veall & Sant, Architects, Cardiff	do.
Wall Round Burial Ground at Wes. Chapel, Rainow	Desborough Co-operative Society	H. W. Sheldon, Sedley House, Rainow	do.
Enlargement of Nun's-lane School	Southampton Corporation	F. W. Purser, Architect, 10, West-street, Gateshead	do.
Ten Houses at Studley	War Department	D. H. Ward, Arch., Warwick-chmbrs., Corporation-st., Birmingham	do.
Paving, etc., Blackrod, Lancs.		J. Gardner, Clerk to the Council	do.
800 Yards of Railroad to join Midland Railway		D. J. Diver, Engineer, Desborough	do.
*Alterations, etc., to Royal Court Theatre, S.W.		C. E. L. Parkinson, Architect, 44, Bedford-row, W.C.	do.
*Erection of Artisans' Cottages		C. J. Hair, Architect, 23, Portland-terrace, Southampton	do.
*Pulling Down Old Houses, Excavating, etc., Windsor		Commanding R.E., 41, Charing-cross, S.W.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	Fulham Guardians	3*l.* 13s. 6d. per week	April 21
*Two Temporary Draughtsmen	Hackney Borough Council	2*l.* 2s. per week each	April 22
*Building Inspector	Cheltenham Corporation	105*l.*	April 23
*Municipal Engineer	Municipality of George Tn., Penang	600*l.*, etc.	April 28

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xviii.

TENDERS—*Continued from page 423.*

LONDON.—For the erection of a nurses' home in Fulham Palace-road, Hammersmith, W., for the Fulham Guardians. Mr. A. Saxon Snell, architect, 22, Southampton-buildings, Chancery-lane, W.C.:—

		Additional amount for sirapite.
Potter Bros.	£13,498	£60 0 0
W. Reason	13,396	90 0 0
Foster Bros.	12,950	50 0 0
Spencer, Santo, & Co., Ltd.	12,851	136 0 0
T. W. Neath & Son	12,622	109 0 0
J. G. Baker & Son	12,537	50 0 0
W. J. Renshaw	12,475	100 0 0
Leslie & Co., Ltd.	12,449	78 0 0
Cropley Bros., Ltd.	12,350	—
B. E. Nightingale	12,280	72 0 0
W. Wallis	12,232	83 0 0
J. Burgess & Son	12,145	28 8 0
C. Dearing & Sons	11,987	Omissions and additions equal.
J. Ferguson & Co.	11,460	169 0 0
Cowley & Drake	11,002	—

LONDON.—For making-up roadway and paving footways of Macmurdo-road, Fulham, for the Fulham Borough Council. Mr. F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.:—

G. Wimpey & Co.	£530	H. J. Greenham	£515
B. Nowell & Co.	525	A. B. Champniss*	462
J. Mears & Co.	525		

LONDON.—For making-up roadway and paving footways of Woodlawn-road (section III.), for the Fulham Borough Council. Mr. F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.:—

Harvey Bros.	£622 12 6	G. Wimpey & Co.	£489 0 0
F. Fowles	497 0 0	J. Mears	489 0 0
H. J. Greenham	500 0 0	A. B. Champniss*	469 11 4
B. Nowell & Co.	493 0 0		

LONDON.—For the erection of a nurses' home in Fulham Palace-road, W., for the Guardians of the Poor of Fulham Parish. Mr. Alfred Saxon Snell, architect. Quantities by Mr. W. T. Pattea:—

		Extra for plastering in sirapite.
Potter Bros.	£13,498	£60 0
W. Reason	13,396	90 0
Foster Bros.	12,950	50 0
Spencer, Santo, & Co.	12,851	136 0
T. W. Heath & Son	12,622	109 0
J. G. Baker & Son	12,537	50 0
W. J. Renshaw	12,475	100 0
Leslie & Co., Ltd.	12,449	78 0
Cropley Bros., Ltd.	12,350	—
B. E. Nightingale	12,280	72 0
W. Wallis	12,232	83 0
J. Burges & Son	12,145	28 8
C. Dearing & Sons	11,987	—
J. Ferguson & Co.	11,460	169 0
Cowley & Drake, Willesden Green†	11,002	—

LONDON.—For road and sewer works, Causton-road (first section), Highgate, for the Hornsey Town Council. Mr. E. J. Lovegrove, Borough Engineer and Surveyor, Southwood-lane, Highgate, N.:—

J. R. Bateman & Son	£1,854 0 0	G. Bell	£1,411 0 0
Grounds & Newton	1,493 11 9	T. Adams	1,410 1 1
W. Griffiths & Co., Ltd.	1,454 15 6	D. R Paterson, Camden Town*	1,390 18 0

LONDON.—For road-making, Coniston-road (second section), Muswell Hill, for the Hornsey Borough Council. Mr. E. J. Lovegrove, Borough Engineer and Surveyor, Municipal Offices, Southwood-lane, Highgate, N.:—

Foster Bros.	£819 10 0	Grounds & Newton	£630 7 0
R. Ballard, Ltd.	695 0 0	Harvey Bros., 25, Victoria-street*	622 1 7
D. R. Paterson	677 10 0		
W. Griffiths & Co., Ltd.	668 18 8		
T. Adams	663 13 3		

MAENCLOCHOG (Pembroke).—For the erection of a chapel, for the Rev. Rhys Williams. Mr. D. E. Thomas, architect, Victoria-place, Haverfordwest:—

M. Young & Ll. Rees	Mynachlogddu, Clynderwen. / Lan Mill Marberth	£1,100

MERTHYR (Wales).—For alterations at the Golden Lion Inn, Dynevor-street, for Messrs. Giles & Harrap. The Brewery, Merthyr Tydfil. Mr. C. M. Davies, architect, 112, High-street, Merthyr:—

T. Jones	£1,165 0	E. Jones, 1, Aeron-terrace, Dowlais*	£920 0
S. Hawkins	1,120 0		
J. Williams	1,095 0		
M. Warlow	1,089 10		

MIDDLESBROUGH. — For main drainage work (Marton Beck Valley Sewer), for the Corporation. Mr F. Baker, C.E., Borough Engineer, Middlesbrough:—

J. D. Nowell & Sons	£20,021 17 0
W. Waring & Sons	17,308 3 2
B. Frith & Co.	16,077 6 6
R. Hudson & Sons	15,526 13 6
J. G. Spooner	14,653 15 6
Parker & Sharp	14,542 3 3
Underwood Brothers	13,782 19 11
Bentley & Loch	13,478 3 6
J. S. Dawson	13,476 8 0
W. & J. Lant	13,021 11 6
J. B. Fowells & Son	12,757 14 0
G. Bell	12,432 8 4
T. D. Ridley & Sons	12,174 17 0
G. R. Waghorn	11,689 5 0
Johnson & Langley, Leicester*	11,121 19 6
W. Brigg	10,779 1 9
Amount to be added for sanitary pipes, penstocks, and ironwork, supplied by the Corporation	1,005 0 0

[Borough Engineer's estimate, £16,000.]

NORWICH.—For alterations to the Boys' Home, St. Faith's-lane, for the Guardians. Messrs. Morgan & Buckingham, architects, 3, Redwell-street, Norwich:—

J. Burton & Sons, Spencer-street and Stoke-street, Norwich*	£1,265

[Eleven tenders received. Highest was £1,748.]

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MORICE TOWN.—For alterations and additions to Morice Town Council Schools, for the Education Committee, Devonport. Mr. H. G. Luff, architect, Devonport :—

	A.	B.
J. Crockerell	£1,577 0 0	£312 0 0
T. May	1,535 0 0	298 0 0
W. E. Blake	1,500 0 0	250 0 0
J. Partridge	1,499 0 0	280 0 0
A. R. Lethbridge & Son	1,225 0 0	265 0 0
J. H. Axworthy	1,189 0 0	385 0 0
J. T. Shepherd	1,184 9 5	256 7 7
Pearce Bros., Embankment-road*	1,164 0 0	250 0 0

OSWALDTWISTLE.—For alterations to the Albert-street Congregational School. Mr. W. Ewood, architect and surveyor. Quantities by architect :—

Plasterer.

J. Barnes, Accrington*	£29 10 0
G. Eastwood	23 19 6

Slating.

Evans & Co.	95 0 0
Farnworth	94 8 6
W. Green, Clayton-le-Moors*	91 10 0

Plumber.

Porter	75 6 0
Tondafe	75 2 10
Booth	67 10 0
Sudall	61 10 0
R. T. Kenyon, Rishton*	60 0 0

Mason, etc.

J. Grimshaw	530 0 0
J. Whittaker	487 0 0
W. H. Bury	431 0 0
G. Cunliffe, Accrington*	415 10 0

Joiners.

Pilkington Bros.	261 0 0
Hodgson	255 0 0
Harrison	240 0 0
Hesketh & Co.	204 19 6
S. Booth, Church*	191 0 0

PAISLEY.—For the extension of purifying house and erection of lavatories and stores, Blackstown-road, for the Gas Corporation. Mr. G. R. Hislop, C.E., Paisley Gasworks :—

Mason Work for Purifier House and Store.

D. Brown & Son, Whitehaugh, Paisley	£615 1 11

Brickwork of Lavatory.

Moon & McCracken, Motherwell	573 12 11

Iron Roofing of Buildings.

W. Christie & Sons, Underwood, Paisley	725 4 8

Carpenter and Joiner Work.

A. Gemmel, 2, Brown-street, Paisley	181 14 6

Slater Work of Roofs.

J. McLintock, 6, Marshall's-lane, Paisley	245 19 2

Lavatory Fittings, etc.

Doulton & Co., Ltd., Hawkhead, Paisley	190 7 6

PONTYGLAZIER (Cardiganshire).—For new bridge at Pontyglazier, between the parishes of Meline and Whitechurch, for the St. Dogmell's Rural District Council. Mr. A. H. Thomas, architect, Haverfordwest :—

R. Phillips	£340 10	Young Bros., Clynderwen, R.S.O.*	£306 0
Michael & Morgan	339 0		

PONTYMISTER.—For alterations and additions to Mason's Arms, Pontymister. Mr. E. N. Johnson, architect, Risca, Newport, Mon. :—

R. C. Jordan	£500 0 0	J. Jenkins	£471 0 0
T. James	482 9 9	J. Charles	419 0 0
C. H. Reed	475 0 0	Leadbeter Bros.	388 10 0

SANDSEND.—For erecting a small villa residence at Sandsend, Whitby, for Dr. W. E. F. Tinley. Mr. E. H. Smales, architect, 5, Flowergate, Whitby :—

Coverdale & Longhorn	£712 7 6	A. Palframan	£662 14 6
J. Braim & Sons	687 0 0	T. R. Fletcher	624 10 0
R. A. Wilson	682 0 0	J. Kidd, Abbeyter., Whitby*	596 15 0

SEVENOAKS.—For raising the level of road at Chiddingstone Mill, for the Rural District Council. Mr. W. H. Bolt, Surveyor, Leigh, Tonbridge :—

Chittenden & Simmons	£308 0 0	H. Constable	£260 0 0
T. Wood & Sons	282 9 3	J. Cheal, Edenbridge*	207 10 0
S. Kavanagh & Co.	281 0 0		

SPRINGWELL (near Gateshead).—For new schools, with out-offices, for the Usworth School Board. Mr. Stephen Wilkinson, architect, 30, Mosley-street, Newcastle-on-Tyne :—

J. Parkinson & Sons, Ltd.	£4,370 12 2	J. MacElhattan	£3,603 9 9
Davison & Bolam	4,189 19 8	W. Foster	3,550 0 0
H. C. Howe	3,921 4 7	W. C. Tyrie	3,458 5 0
D. Chambers	3,917 7 6	T. Hunter	3,455 0 0
Thompson & Son	3,806 11 2	J. Burnett & Son	3,442 12 0
W. Hall	3,733 12 2	C. Groves	3,400 13 0
J. Ross	3,695 10 1	T. Soulsby	3,378 0 0
H. S. Douglas	3,664 7 5	J. Robinson	3,343 13 4
		D. Bruer, New Washington*	3,178 18 5

ST. ANDREWS, (N.B.).—For providing and laying pipes in South-street, for the Town Council. Mr. W. Watson, Borough Surveyor. Quantities by Surveyor :—

F. Watson & Co., Ltd.	£897
G. Mackay & Son	838
J. Farquharson	825
Carrie Bros.	748
A. Turpic	728
MacLeish Morrison & Co., Perth*	713

TREDEGAR (Wales).—For street improvements at Sirhowy Hill, for the Urban District Council. Mr. W. L. Roach, Surveyor, Bedwellty House, Tredegar :—

Monks & Co., Newport, Mon.*	£346 12 0

WADSLEY.—For erecting twelve houses and conveniences in Laird-road, for the Committee of the Ancient Order of Foresters' Investment Association (Sheffield District) :—

R. Charlesworth, Parsonage-street, Walkley, Sheffield*	£2,890

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The Builder.

VOL. LXXXVI.—No. 3194. APRIL 23, 1904.

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New Buildings for the Law Society, Chancery-lane .....Mr. Percy Adams, F.R.I.B.A., Architect.
1. Exterior.
2. Interior details.
3. General View of Interior.

Bungalow, Chorley Wood .....Mr. Arthur O. Breeds, Architect.

Residence for Weston-super-Mare .....Mr. H. Dare Bryan, F.R.I.B.A., Architect.

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Notes on Egyptian Irrigation.

WHILE recognising the valuable aid furnished by the Nile Reservoir Works, the point should be emphasised that the satisfactory completion of the works in question represents merely a portion of the inestimable services rendered to Egypt by the Public Works Department. Therefore, in the following notes we propose to make some general reference to the duties performed by the irrigation authorities and to the various engineering works carried out by them in different parts of Egypt. Some of these works, quite apart from what are popularly termed the Nile dams, are of considerable magnitude, and if executed in Great Britain would have been heralded with much blowing of trumpets. Having been executed in Egypt by public servants who are accustomed to doing great deeds in a quiet and modest way, they are scarcely known in this country outside official circles.

In the first place, we will briefly outline the natural conditions of the water supply in 1902, as stated in the last report of the Public Works Department, so that subsequent references to engineering and administrative work may be more intelligible to our readers.

Throughout the early summer months of 1902 the levels of the Nile were very low, and during the three succeeding months the increase was very slow. In August the level at the Aswân gauge was more than 1·30 mètres lower than any previous records for the same date, and nearly 2·50 mètres lower than the average level for the same date of the thirty years ending 1892. At the same time the Soudan gauges recorded ominously low water levels and showed no indication of improvement. As late as the early part of September the levels remained unprecedently bad, and anxiety was very generally entertained as to the supplies for the country to the south of Cairo.

At the last moment, however, the situation was saved by a most welcome rise of the Blue Nile and a belated flood in the Atbara river. The characteristic features of this, the fourth bad flood in succession, were the abnormally low levels maintained during August and the unexpected rise in September at a time when no precedent existed for any improvement.

Considering the condition of things as stated above in brief outline, it is abundantly clear that exceptional measures were very necessary for ekeing out the scanty supplies of water, and it may assist our readers to appreciate the assistance rendered by the Nile dams and other irrigation works if we state in general terms the nature of the regulations in question.

Except in a few localities, the cultivation of rice was prohibited, as the canal "rotations" governing the supply of water to agriculturists were drawn up so as to devote all available water to cotton-growing areas, and the sowing of maize was prohibited except by special authority from the Public Works Ministry. Earthen dams were built near the sea in the Rosetta and Damietta branches of the Nile, to prevent the ingress of sea water and to act as storage reservoirs. The Delta barrage was regulated to prevent any waste of water and to take full advantage of the first rise of the river, while the Asyût barrage was partly closed during the summer to secure the adequate irrigation of Middle Egypt and the Fayoum Province. The Afteh pumping station on the Rosetta branch of the Nile was temporarily used to draw water from the river, thereby increasing the supply of the Mahmudiyeh Canal, the great water-way connecting Alexandria with the Nile.

In Lower Egypt, as Sir R. H. Brown, Inspector-General of Irrigation in Lower Egypt, says in his report to the Under-Secretary of State, there was not enough water to satisfy the demands of the cultivators or to permit unrestricted cultivation. In Upper Egypt, where basin irrigation has not yet been replaced to any considerable extent by perennial irrigation, there was the same shortness of water, and Mr. Verschoyle, Inspector-General of Irrigation in Upper Egypt, tells us in his last report that considerable anxiety was felt throughout the country in the summer of 1902. South of Asyût, basin irrigation is entirely dependent upon the important canals supplied by the Nile, and at the time when these feeders should have been running full the river levels were so low that in many cases water could not enter the canals at all.

Having now before us a brief statement of the conditions characterising the water supply of 1902, we will direct attention to the various engineering works which permitted the administration to make the best use of the supplies available, commencing with Upper Egypt.

The whole of the Nile flood of 1902 passed through the sluices of the Aswân

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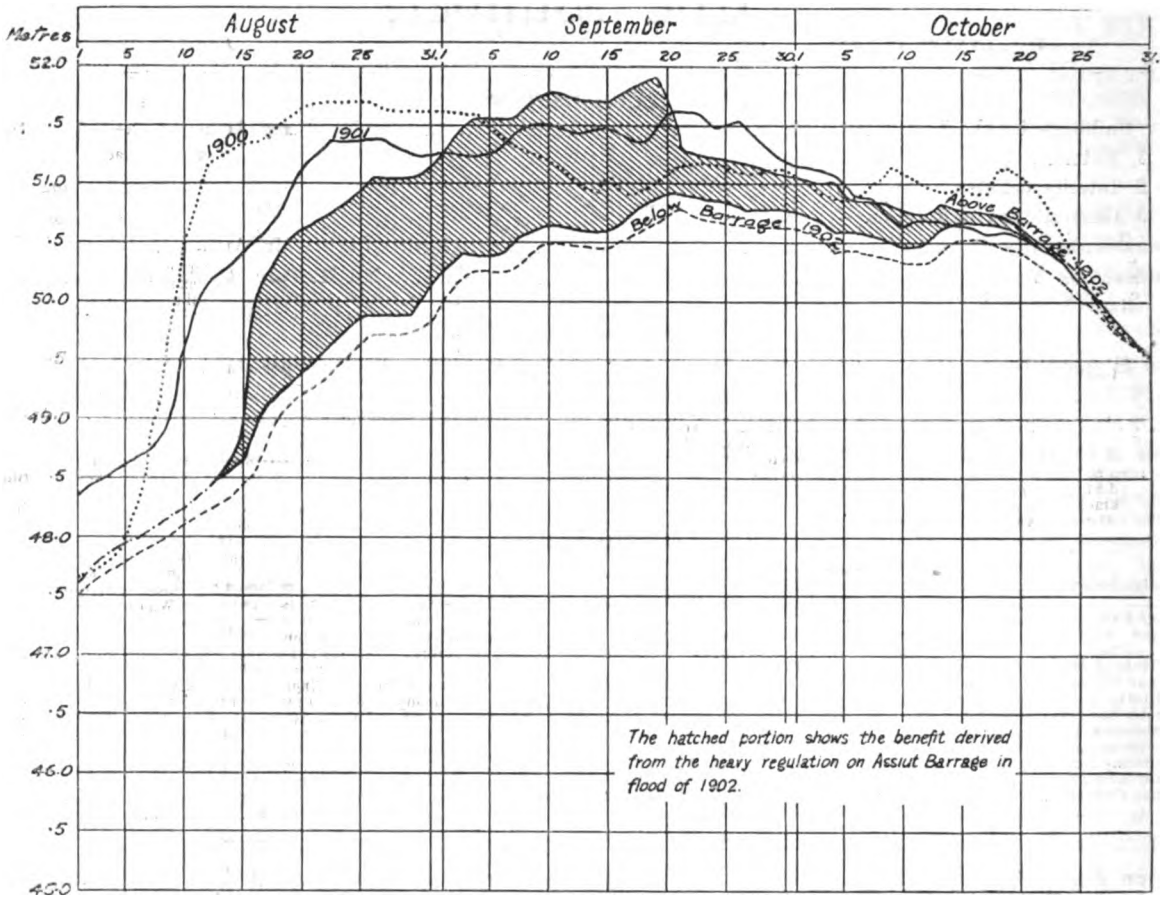

Fig. 1.

dam, a work which is designed simply as an aid to irrigation after the flood has passed. Owing to the low state of the river after the flood, and recognising the desirability of avoiding interference with navigation, the filling of the reservoir was commenced at the early date of October 20 and finished by the end of January, 1903.

Mr. A. L. Webb, Director-General of Reservoirs, states in his report that regulation was carried out very satisfactorily after a few days' experience in manipulation of the sluice-gates, and that the effect on the river levels was scarcely perceptible.

Turning now to the Asyût barrage, we may remark that at the commencement of 1902 only part of the parapet remained unfinished, this being completed and the regulating gates fixed in position before the middle of February in the following year. All subsidiary works were completed by the end of May, when the work was taken over by the Egyptian Government. The essential function of the Asyût barrage, it will be remembered, is to raise the level of the river above the intakes of the great arterial canals which afford the greater portion of the water supplies to the northern districts of Upper Egypt.

Owing to the conditions prevalent during August in this part of the country, it was decided, in the interests of flood irrigation, to completely close the new Asyût barrage on August 15. The result of this operation was to raise the level of the river so that a very fair flood supply was afforded in the Ibrahimiyeh Canal, and what would have been a disastrous year for Middle Egypt was converted into a fairly good one. Fig. 1 shows the benefit derived from the regulation at Asyût, as indicated by the gauge at the head of the Ibrahimiyeh Canal. The barrage remained closed until September 19, when the flood attained its maximum and anxiety was at an end. It is extremely gratifying to report that, although only completed a few months before, the barrage stood this test remarkably well, and rendered most invaluable service throughout Middle Egypt, the Fayoum, and West Gizeh Province.

Mr. Webb says that it is very difficult to estimate the monetary value of the benefits secured through the instrumentality of the Asyût barrage. In his opinion the direct and indirect gain was certainly not less, and in all probability was more, than 600,000*l*. As the cost of the barrage and subsidiary works, exclusive of the Ibrahimiyeh Canal regulator and lock, was only 720,000*l*., it will be seen that the works practically paid for themselves in the very first year of operation. This is a most significant result, and it should serve to encourage those who have been inclined in the past to begrudge the spending of money upon irrigation works in Egypt.

The Director-General of Reservoirs repeats the recommendation made in the report of 1899 that two barrages similar to that at Asyût are much needed in Upper Egypt. The effect of these would be to reduce or to abolish entirely the large areas of "sharaki" lands, which do not retain moisture long enough to permit the ripening of crops without additional irrigation. Further, the additional barrages would greatly improve the irrigation and the value of certain large tracts of basin lands in low and average floods, the areas in question being so situated that they can only receive proper flood irrigation in years of more than average flood.

We emphasise the point here raised because it is very important that everyone should be made to realise the urgent need still existing in Egypt for further irrigation works. The Nile dams, of which we have heard so much of late, are undoubtedly of the greatest value, but they are really no more than a small instalment of the engineering works necessary for the service of the country.

A section of the Ibrahimiyeh Canal regulator and lock is given in Fig. 2, the work including a regulator of nine openings, each 5 mètres wide, and a lock 8·50 mètres wide. These new works were undertaken simultaneously with the Asyût barrage, being practically completed in 1901, and the remaining parts of the superstructure were finished before the end of March, 1902, the erection of the ironwork being concluded by the end of June. The importance of the Ibrahimiyeh Canal may be realised by the statement that the mean discharge in the canal from April to June averaged more than 11,000,000 cubic mètres per day, and that the areas irrigated by it aggregate upwards of 150,000 acres.

Regulation of the Asyût barrage afforded a very fair flood supply in the Ibrahimiyeh Canal, and the completion of the new head regulator proved of much value.

The Bahr Yusuf, which, with the Hassan Wassif Canal, supplies the Fayoum Province, was also well maintained. The discharge in this ancient waterway from April to June averaged 2,720,000 cubic mètres per day, and the mean summer discharge entering the Fayoum was 1,600,000 cubic mètres per day, as compared with 765,948 cubic mètres daily, the mean of five previous low years since 1891. The mean for four high years during the same period was 1,739,658 cubic mètres per diem.

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These figures show very conclusively the great advantage resulting from the new works at Asyût, for in a poor year the water supply was not far short of that afforded during four good years under previously existing conditions.

We will now refer briefly to administrative work connected with flood irrigation in Upper Egypt. Only those who have made a study of the subject are able to form a just conception of the extraordinary network of canals, siphons, and drains by which the land is intersected, of the wonderful chains of embanked basins, or "hods," into which it is divided, and of the numberless regulators, sluices, escapes, and other structures provided for controlling the flow of the flood waters. Any detailed reference to flood irrigation would be perfectly unintelligible unless accompanied with a series of maps, and we cannot do more than to allude in the briefest terms to the nature of the duties performed under the direction of the Inspector-General of Irrigation during the season 1902.

For the control of the flood waters regulators were closed, escapes were opened, canals were dammed by "sadds," cuts and small channels were made, canal banks were repaired, and embankments were built round high tracts in numerous basins, to insure the equable distribution of water. As the flood wave was directed over the face of the land, the great valves in the huge system of conduits were further regulated, so as to permit the waters to flow away through the tail escapes of the various chains of basins. Everything possible was done to provide for the needs of cultivators, but in many areas the levels were not sufficient to permit the required flow.

In the report for 1901 a list was given of some seventy works shown to be necessary for the improvement of flood irrigation in Upper Egypt. Twenty of these were completed during 1902. The works then executed comprised the lengthening and remodelling of canals, the construction of new canals, drains, escapes, siphons, head regulators, and culverts.

Expenditure was also incurred for the purpose of reducing "sharaki" areas, in making new distributory channels, in deepening existing channels, and in building banks around the higher portions of various basins, river sabels, and islands. Some of these works were of temporary character, and others remain as permanent improvements. The total "sharaki" area avoided in the provinces of Aswân, Kena, Girga, Asyût, Miniyeh, and Beni-Suef, as the result of these works, is estimated by the Inspector-General at 77,773 feddans (about 81,660 acres). A good idea of the improvement effected within recent years may be gathered from the fact that the total "sharaki" area has been reduced from 791,691 acres in 1877 to 107,100 acres in 1902.

A great deal more was undertaken or advanced in the same season under the head of "Special Works," chargeable to a special Caisse credit and to a special grant from the ordinary budget. Projects of this kind included a large number of items, of which we can only mention some of the more important.

Work on the west of Yusufi basins, commenced in 1899 and finished in 1902, comprised the construction of two important regulators, each really deserving the title of "barrage," three new regulating bridges, quarters for staff and storehouses, and the embankment of new basins, the total cost being 211,013*l*.

The Mazurah regulator, consisting of twenty-five 3-mètre sluices with a lock and lift bridge, was completed in 1902, at a total cost of 55,589*l*. This regulator proved of great service in preventing "sharaki" in the Beni-Suef basins, and improved the drainage of the perennial area in Fashu Markaz. Considerable progress was made with the extensive remodelling projects in the Fayoum, and, as the total expenditure at the end of 1902 was above 220,000*l*., some estimate may be formed of the extensive character of the operations.

In a district known as the Projects Circle some equally important works received attention, comprising the conversion of large basin areas in Asyût and Miniyeh provinces into perennially irrigated tracts, this conversion being rendered possible by the completion of the

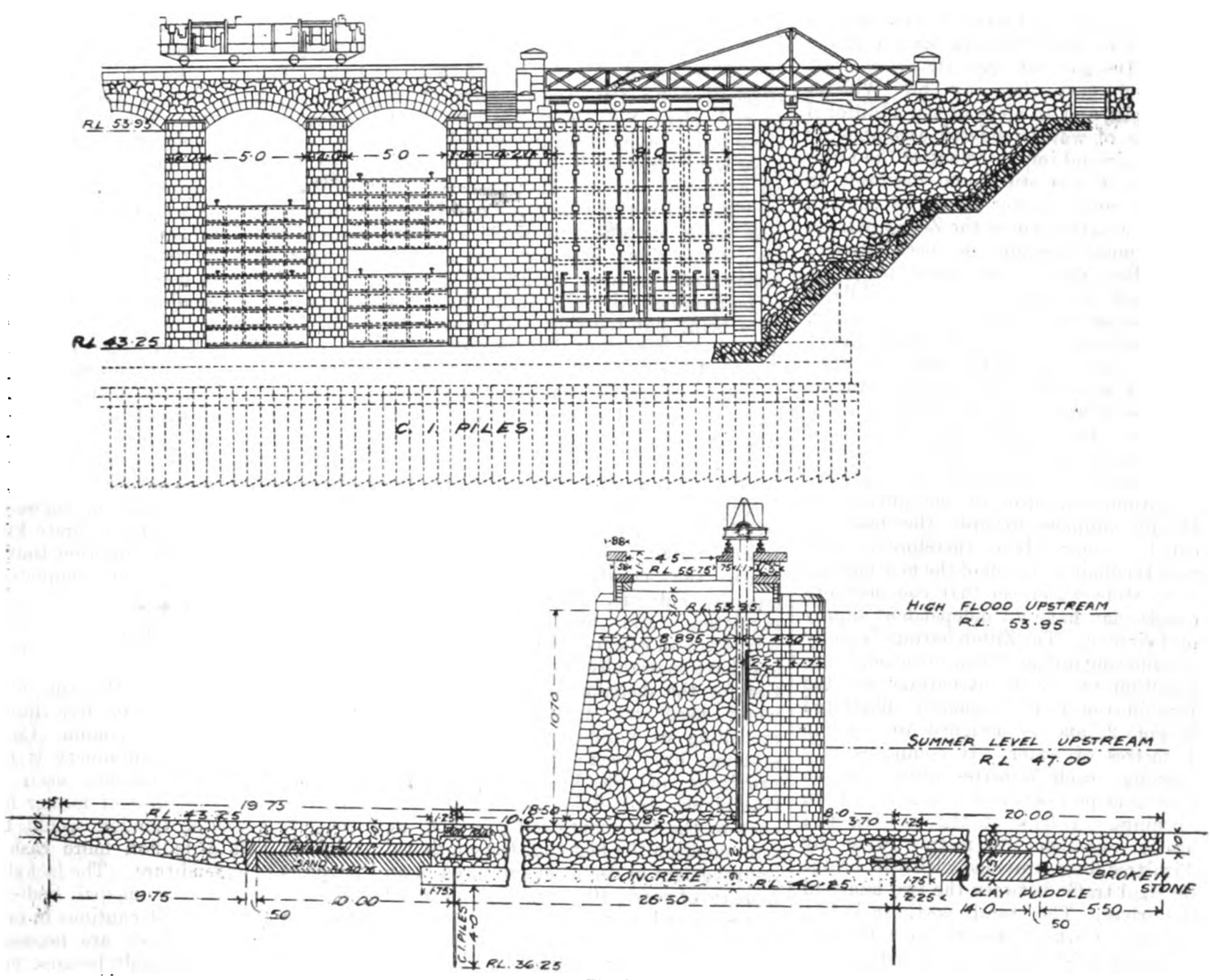

Fig. 2.

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Aswân dam. Among other works being carried out in this district the widening of the Ibrahimiyeh Canal is the most notable, the expenditure for the year amounting to nearly 34,000*l.*, and the total up to that date to about 62,000*l.*

The total expenditure on the works mentioned in the report of the Inspector-General of Irrigation for Upper Egypt during the year amounted to 598,143*l.*, quite independently of the Nile Reservoir accounts, and the extent of the improvements effected in canals and other waterways may be gathered from the following statement, which gives the length of new and remodelled banks and channels in kilomètres :—

New irrigation channels	407.910	kilos.
Remodelled channels	53.500	,,
New drains	238.800	,,
Remodelled drains	152.700	,,
New banks	2.880	,,
Total	855.790	,,

We have already referred to the general conditions of water supply in Lower Egypt, and to the advantages obtained by regulation of the Delta barrage, the usefulness of which was much increased, as in the previous year, by the new weirs which were described in a previous article.* Although the irrigation system of the Delta is in a far more highly-developed condition than that of Upper Egypt, there still remains a very large amount of work to be done before the whole of the country can be adequately used for the purpose of cultivation.

The Zifteh barrage, finally completed in 1903, is one of the most important irrigation works in Lower Egypt, and is situated on the Damietta branch of the Nile. Designs for this structure were prepared years ago by Sir William Willcocks, and, in spite of the additional supplies of water rendered available by the repair and improvement of the Cairo barrage, it was still found desirable to provide some further means of control. By the construction of the Zifteh barrage a new point of supply has been afforded from the Nile to the great irrigation canals of the Delta about the middle of their respective courses. Consequently, the northern districts of Lower Egypt receive supplies during July for then existing demands, and during August water is admitted to the southern canal systems. In former times the water supplied to the latter systems from the main feeder was intended not simply for irrigation, but also for the purpose of forcing supplies towards the northern canal systems. It is therefore evident that the main function of the new barrage is to store water, so that the northern canals may have an independent supply of their own. The Zifteh barrage is really a regulating bridge, similar in general construction to the Asyût barrage and the Ibrahimiyeh Canal regulator illustrated in Fig. 2, and is designed to hold up 4 mètres of water. It comprises fifty openings, each 5 mètres wide, with an abutment pier between each group of ten openings. A lock at the western end has a chamber 12 mètres wide by 65 mètres long, provided with a lift bridge for road traffic between the two banks of the river. The total cost, including auxiliary works necessary for connexion with the existing system of canals was about 500,000*l.*, and it is worthy of note that the whole work was completed within two years.

Among other important masonry works in hand during 1902 were the Ismailiyeh Canal head, the Dimereh lock and regulator, and the Rayyah Behereh head.

The Ismailiyeh Canal new head, commenced in 1901, has now been completed. On account of the difficult nature of the foundations, the platform was constructed by well-sinking combined with the cement-grouting method. The whole area of the foundations was surrounded by rectangular wells, in addition to which circular wells were sunk under part of the lock island, and also under the four wing walls. The masonry superstructure was commenced in 1902, the entire work being finished early in the following year. An additional waterway has been provided at the Siriakos regulator in the same district, and a similar work has been designed for providing an additional waterway for the Bilbeis regulator; but, unfortunately, this has not been taken in hand for want of funds.

The construction of the Dimereh lock, 24 mètres by 6 mètres, and the remodelling of the old Dimereh regulator were completed during the year, at the total cost of about 80,000*l.* The old regulator, having no lock, formed a considerable obstruction to navigation, and the new work is a very considerable improvement.

The Rayyah Behereh head was the last of the regulating works at the Delta barrage remaining to be remodelled. This work comprised the addition of a lock, two sluiceways to the old work, and the diversion of the old lock into two sluiceways by the construction of a central pier. Sills were also built in three bays of the old regulator, and seven bays were fitted with gates actuated by an overhead winch. The new lock is provided with three pairs of gates, one pair being designed to resist pressure from either side. The work was a most difficult one, as some strong springs had to be dammed with clay while the gates were being put together and hung. As it was most important that the operations should be completed before the flood season, work was continued day and night by the aid of electric light. The total cost of the work, including a small portion completed in 1903, was about 40,000*l.*

Numerous minor masonry works have also been carried out in various parts of Lower Egypt, including canal conversions, the construction of siphons, escapes, culverts, pipe lines, bridges, regulators, and head sluices. These works are all of considerable importance, and have materially increased the facilities for the distribution and control of water used for irrigation. The remodelling of various canal and drain systems has been continued in the provinces of Sharkiyeh, Dakahliyeh, Gharbiyeh, and Behereh. With reference to the last-mentioned province, we may mention the fact that the continued improvement of drains has resulted in an increase of nearly 40 per cent. in the areas of cotton and winter crops. In the other provinces the works have also increased the cultivated areas, although not to the same extent. Among the other minor works executed in Lower Egypt only one, the reservoir at Ezbet-el-Borg, need be specially mentioned. This work was designed for the purpose of supplying drinking-water to the seaside resort of Ras-el-Barr and the village of Ezbet-el-Borg, both near the mouth of the Nile at Damietta. When the temporary dam is constructed at this mouth of the Nile the river water is practically as salt as that in the sea itself. Consequently, the inhabitants have previously been dependent upon the scanty supply of water in the canal, and, as happened in 1901, they frequently suffered severely from want of drinking-water. To obviate this hardship, the reservoir to which we refer has been constructed at a cost of about 8,000*l.* The internal dimensions are 85.50 by 25.60 by 3.30 mètres, and the capacity is nearly 7,000 cubic mètres of water. The reservoir is completely covered so as to protect the water from the sun, and the roof is formed of brick arches carried on columns of brick masonry. The use of iron has been entirely avoided, as the rapid decay of iron roofing in the Damietta cistern demonstrated the unsuitability of metal for such work.

In conclusion, we may note that very satisfactory progress is being made with the important land reclamation works in the Wadi Tumilat, a long valley lying between Zagazig and Ismailiyeh. These important works are now almost completed, and have included the enlargement of the Kassassin pumping-station and the construction of main outfall drains between the pumping-station and Lake Mahsama, and from the latter to Lake Timsah. Branch drains, field channels, head sluices, wooden bridges, and various other works have been carried out, and steam ploughs have been at work for months breaking up ground which native ploughs were totally unable to deal with. As a result of these operations about 17,000 acres of land have been brought into cultivation, the revenue from which even now is considerably in excess of the annual expenditure.

In consequence of the completion of the reservoir works in Upper Egypt, and the possibility of further extending the cultivable land in Lower Egypt, owing to the additional supplies of water that may become available, various land reclamation projects are now under consideration by the authorities. At the present time surveys are in progress for the purpose of obtaining accurate knowledge of the land levels in order that the necessary schemes may be completed.

* *The Builder*, Vol. LXXXIII., No. 3,111, pp. 241-245.

NOTES.

The London County Council Loan.

THE successful issue of the new loan of five millions by the London County Council at the price of ninety is noteworthy. Had the Council been able to issue it at the price of former loans the ratepayers of London would have received half a million more cash for purposes of expenditure. The fact shows the necessity for municipal bodies at the present time to be cautious in taking up new schemes which are necessarily more expensive, not only because municipal bodies, owing to the state of the

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money market, can obtain less money on loan, but also because, owing to the higher rates of interest now current, contractors who have often to work on borrowed capital have, in their turn, to pay more for the financial accommodation they require. All these facts point to a curtailment in some degree of municipal enterprise that will, for a time at least, do more to check municipal trading than the report of any number of parliamentary committees.

The Survey of Voluntary Schools.

ACCORDING to the report of the meeting last week of the Educational Committee of the Herts County Council, considerable dissatisfaction exists at the slowness of the survey of the buildings of the voluntary schools and of the teachers' houses. The same complaint is heard in other parts of England. There certainly seems to have been a want of vigour on the part of the County Council. It was obvious from the first that the survey of these buildings in order to enable County Councils to decide how much should be paid for wear and tear of school buildings, and what rent should be paid for teachers' houses, must necessarily occupy a long time. Many of the schools are at a distance from the surveyors' headquarters, and the survey must be a careful one going into small details. So far as we can learn, many County Councils do not seem to have appointed special surveyors, as it was clearly necessary for them to do if the work was to be completed in a reasonable time. The Herts County Council now hope to complete the survey in three months by giving the surveyor additional assistance, which, of course, should have been done months ago.

The Title of the *Builder*.

WE assume, of course, that the subject of Mr. W. E. Davis's paper at the Discussion Section of the Architectural Association, reported in our last issue, was selected merely because the first volume of an architectural journal, started sixty years ago, and which was then the only one of its kind, affords opportunity for what may be called an archæological study of the ideas of that period; and we need not enter into any comment on the discussion which ensued. But on the curious manner in which this journal came by its title, and on the title itself, a word may be said. Few people at present are probably aware of the fact mentioned by Mr. Davis, that the paper was actually at first started as a journal for builders and contractors, who, it was thought, offered a promise of a large *clientèle* for a paper specially devoted to their interests. When this proved a disappointment, the fortunate idea occurred to the late Editor, who was the real founder of the paper as far as its ultimate success was concerned, that the word "Builder" might cover a much wider field; and on the title-page of the 1848 volume there was first inserted that apposite quotation from "The Diversions of Purley," which has stood there ever since—

"Our English word to build is the Anglo-Saxon *Byldan*—to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."

This was no doubt selected by way of indicating and justifying the wider scope taken by the paper while retaining its original title. In a periodical, a title once chosen is a thing you cannot shake off, even if it become palpably inappropriate; witness the cases of the *Fortnightly Review* and the *Nineteenth Century*. But in our own case we think this almost accidental result was a fortunate one. "Builder" includes everything connected with construction; it takes in engineering, and surveying, and ancient buildings, and decorative arts in connection with architecture, etc., which a more restrictive professional title could not have included; and it is an indigenous English word. Once, indeed, we received a letter from a contractor complaining that the *Builder* did not answer to its name, as it did not specially represent the interests of builders; but we think the meaning of the title is pretty generally understood now, and that it is a fortunate one, although it was first given with a different meaning from that which it now implies.

Registration Politics.

THE move made by a self-appointed Committee of members of the Institute of Architects (referred to by the President at the meeting on Monday) to endeavour to commit all the members of the Institute to a decisive expression about the registration of architects, at the very time that an officially appointed Committee is sitting to consider the question, is a piece of policy significant of the manner in which this movement is being worked by its supporters. This self-appointed Committee, which includes two or three members of the Institute Council, have sent round, it appears, about 2,000 circulars to architects, including members of the Institute, asking them to give a formal written expression in favour of registration, by way of endeavouring to get up a vote for it in advance before the Committee send in their report. It is worth note that the circular was not sent to the President of the Institute, nor was it sent to the Editor of this journal, who, it was known, would not support it. In short, it is a rather shabby attempt to get at the profession behind the backs of the President and Council of the Institute and of the official Committee now sitting. To sensible people a cause is hardly likely to be recommended by such tactics as these.*

* By a letter on another page it will be seen that one of the members of this Committee, at all events, has disapproved of their action and withdrawn his name in consequence.

The Wells Sculptures.

MR. PRIOR'S paper at the Institute of Architects on Monday, on the sculptures of Wells Cathedral, was the occasion of some very interesting comparative illustrations of the sculptures at Chartres, Rheims, and Wells, which would have quite borne out, had there been real need for such evidence, Mr. Prior's view that the work at Wells was the production of an English and probably a local school of sculptors. As far as all except the Resurrection series of figures are concerned, we have never doubted or seen any reason to doubt the native origin of the Wells sculpture. The Resurrection figures, which we examined closely many years ago at a time when there was scaffolding over the front, are on a different scale from the other figures, and, besides being nude, present a vigour of action and movement quite different from the conventional decorative stiffness of the other sculpture. They are so much weatherworn now that it is difficult to say how far they were really correct anatomically when first executed; but they convey the impression, in some places, of having been worked from the life, and both in their frank nudity and their vigour of action they are certainly different from any other mediæval sculpture in England; and therefore it seems not improbable that they may have been the work of foreign artists imported. No illustrations of this series of figures were shown at the meeting, we do not know why. In regard to the remarkable unity of sculpture and architecture on this front, which, as Mr. Prior put it, is really a screen for the exhibition of sculpture—an iconostasis, the lesson to be learned from it is that if sculpture is to blend with architecture as part of the design, it must give up some of its own life in order to keep its place in an architectural scheme. It is that rigid conventional character of the Wells sculpture (all but the Resurrection figures) which enables it to take its place as so completely a part of the architectural design. It fulfils its function very finely when considered *en masse*, but to compare it with Greek sculpture, as was done by one speaker at the meeting, is too absurd. It is very like archaic Greek sculpture in some particulars—so is a good deal of mediæval sculpture; but then mediæval sculpture never got beyond the "archaic" stage.

The Sentiment of Decoration.

MR. ALFRED EAST'S lecture on this subject at the Society of Arts on Tuesday evening did not exactly answer to what we expected from the title, which seemed to promise a consideration of the interesting question—how far can decoration express a sentiment? The main point of Mr. East's paper really was that symmetrically repeated ornament had no sentiment; that the feeling and individuality of the designer could only receive scope when his design was freed from the trammels of symmetry; but—and this was an important "but"—that symmetry of another kind, on each side of a centre line, was attained by having an equal expanse of dark on either side of the centre, or by having an expanse of half-tone weighted by a small area of deep tone on the other side (like a pound of feathers and a pound of iron in two scales). This is really a most suggestive idea in reference to landscape-painting (it was capitally illustrated by a rapid sketch of a landscape composition in chalk on the black-board), and there is a good deal in it in its reference to decoration, though we must observe that Mr. East's first sketch (in charcoal on white paper) of a piece of free decoration *à la* Japanese is not what we should call decorative design, but decorative arrangement of natural forms. Zigzagged branches, reproduced after nature,

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however balanced in arrangement, are not decoration. As to the decorative treatment of pictures, we have no objection to the term "decorative" to express a quality, which, as Mr. East said, ought to exist in all pictures, and agree that a picture is incomplete without it; only to be decorative is not enough for a picture from life. A portrait ought to be decorative in line and colour, and is incomplete in an artistic sense if it is not so; but the *first* object is that it should give vividly the features and characteristic expression of the sitter; if it fails to do that, being decorative will not save it, except with critics who are very much off their centre. However, it was a very thoughtful lecture, and one to arouse thought in others. Mr. Walter Crane occupied the chair.

The Leicester Gallery.

THE collection of more than a hundred drawings and studies by Burne-Jones at the Leicester Gallery did not draw, on the private-view day last Saturday, the crowd that we expected to find. Burne-Jones's art, of course, never appealed, and was never meant to appeal, to popular taste, but we should have thought there was a large enough esoteric public in London to crowd a room where these studies were exhibited. The collection illustrates, as Mr. Sidney Colvin remarks in his preface, the extraordinary industry of the artist. The amount of work, careful and delicate work, represented by his studies for pictures alone, of which these are but a small portion, seems enough to fill an artistic lifetime. Something there is wanting, no doubt, to place Burne-Jones in the rank of truly great painters. In a prosaic age of painting he kept steadily before him a highly poetic ideal, from which he never swerved; but the field of his poetic ideal was limited. The same forms, the same expression in the heads, meet us again and again; and while the quality of beauty is hardly ever absent, that of strength is almost entirely wanting. There was something feminine about his genius; his figures and heads of men are almost always weak; and his female figures do not represent the highest type of woman; they are creatures of a dream, not the "perfect woman, nobly planned." The head called "Desiderium" (16), which was selected to reproduce on the invitation card to the exhibition, is to our thinking almost repellent in its over-wrought and unhuman expression; but, as it represents "Desire" in the masque of Cupid, this may be right, and at all events it shows character, an element almost entirely wanting in most of the female heads, which have nearly all the same kind of dreamy undefinable expression; Pope's ill-natured line—

"Most women have no character at all,"

would certainly apply to women as portrayed by Burne-Jones. Some of the earlier heads, such as No. 35 in the catalogue, dated 1873, show more human character and less of the conventional type which pervades the later ones. Among the studies exhibited are a beautiful pencil drawing of lilies (27), a study for a bird's wing (9) and chalk studies of birds (11), a study for a head-dress in the "Wheel of Fortune" (15), remarkable for the beautiful composition of the lines; these and others of the same kind show how carefully the artist studied the detail of his pictures. Among the complete figures is a beautiful nude study for the Venus in the "Mirror of Venus" (103), and a nude study in silver point and white (110). Among the peculiarities of the collection are various studies of draped figures in gold line or dot on variously coloured grounds; some of these are curiously stiff and angular in design, as if the employment of this medium affected the artist's style of drawing. Everything in the collection, however, belongs to or contributes to an idealising school of art; and this idealism is emphasised by contrast with the collection of Old Stipple Engravings in the next room. These represent a kind of art which Burne-Jones's very soul abhorred, and not without reason. Valuable as they may be (at present) from a collector's point of view, and interesting as examples of the taste of their day, there is little or no beauty in them; they are the kind of things that lead one to look in the catalogue, from curiosity, to see what they are about, but that is all; they do not represent art in any sense in which the word is worth anything, and we could be well content to do without them.

Mr. Bertram Priestman's Landscapes.

AT the Goupil Gallery there is a collection of landscapes by Mr. Bertram Priestman, concerning which our first feeling is one of regret that an artist possessed of such exceptional gifts should have shown such a decided tendency towards casting in his lot with what we call the "smeary" school of landscape-painters, who paint trees, for instance, as masses of brush-work with no detail, and only the form of the outline to tell you that they are trees. Or has Mr. Priestman been painting for the prevalent style of the Goupil Gallery, which is devoted more especially in landscape, to the modern Dutch school? If so, he has almost gone beyond his models; for the Maris's, who are the great men at the Goupil Gallery, show more detail than in most of Mr. Priestman's pictures here. On the other hand, he avoids the cold, grey tones of the Dutchmen, and in colour he is as attractive as in composition. These are landscapes of a high class, no doubt, but they carry breadth too far, to the extent of losing realism altogether. The two finest are perhaps the two largest, "Evening after Rain" (15) and "The Ford" (29), a landscape and cattle picture, remarkable for its fine effect of light in the foreground. Among the smaller ones, "A Suffolk Mill" and "On the River Urr" (12 and 18), are very fine little landscapes. Those in which the sea is treated are not happy, and show the tendency which we have met with among other painters of the new school, to dismiss apparently all attempt at drawing and defining the forms of waves, and merely to represent them by a medley of brush marks of varying tones. In "Towing out Mud Barges" (16) it would be impossible to tell that the surface represented was meant for sea at all, but for the fact that a steamer and barges are shown on it. This is hardly conscientious painting.

Messrs. Tooth and Sons' Exhibition.

AT the spring exhibition at Messrs. Tooth and Sons' gallery the outer room is occupied by a dozen examples of the work of Mr. Fritz Thaulow, all of originality and interest, though the artist has rather overdone his effect of light on rippled water both in "Village on the Dordogne" (1) and "River in Normandy" (3). "The Old Fabrique, Christiana" (5) shows that effect of a half-frozen river between banks of snow and ice which Mr. Thaulow has made his own. The best pictures of the set are two of the smaller ones, "Le Soir après l'Orage" (9), which is a bold and broadly composed piece of effect, and "Sunset" (12) as seen in a village street, with some of the cottages in red light. The large room is rather a disappointment; there is no figure-picture in it of real importance, for Meissonier's "Dimanche" (54), though the hand of the master is obvious in it, is not a Meissonier of the first order; and Benjamin Constant's "Constantine and his Councillors" (53) is rather a piece of colour effect than a seriously-studied picture. The first three landscapes in the room are respectively by three masters of landscape—Harpignies, Dupré, and Corot, and contrast in a very interesting manner the style of the three; those by Harpignies and Corot, though small, are each good specimens of the artist, that of Dupré is not; and further on we come to a Diaz (18), which is not Diaz at his best. Cazin's "Ville de Dinart" (19) is a fine clear bit of town scenery. Then we have Clays' large picture, "Entrée du Port de Marseilles" (22), which is a good example of his effective but mannered rendering of the sea, and Mr. Peter Graham's "Down to the Stream" (26), a mountain scene with Highland cattle in the foreground, which is quite in the artist's most forcible way, but a very old and well-known combination. Two very small landscapes by Mr. James Faed, jun. (58 and 59), are very good, and Mr. Pickering's "An Autumn Cloud" (57) is a powerful though rather sombre piece of work. There is a good deal too much of Mr. Leader's hard and mannered landscape painting, which is popular no doubt, but does not appeal much to those who take landscape painting seriously.

Studies of Animals.

AT the Fine Art Society is a collection of studies of wild beasts, by Mr. J. M. Swan; mostly slight in character, such studies as an artist makes as a means to an end, and it may be questioned whether they contain quite the stuff to make an exhibition of; though Mr. Swan's mastery of animal form and movement is so notable that it is of interest to see how he obtains it. One is particularly struck by the sense of movement conveyed in the studies of animals walking, the jaguar in pastel especially (4), and the two lionesses (21, 25); and the "Tigress Drinking (27), with head to the spectator, shows the build of the anatomy in a remarkable manner. Among the best besides these are the "Tigress Watching Tortoise" (45), the "Puma" (94), "Leopard in Lair" (95), and the drawing, little more than an outline on brown paper, of a

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"Group of Lions" (102), who have composed themselves for the painter's purpose in a manner which could not have been improved; presumably the animals may be credited with it, as one cannot haul lions about and pose them.

M. Monod's Drawings.

At the Dowdeswell Galleries is a collection of crayon drawings by M. Lucien H. Monod, "Associé de la Société Nationale des Beaux-Arts." These are delicately executed crayon drawings in fine outline on brown-tinted paper, slightly shaded and touched with white for the light. They are nearly all figures of women; some of them portraits, which remind one of M. Helleu translated from dry-point into crayon. Some of them are very well drawn nude studies, in which, however, the artist seems inclined to seek difficult rather than graceful poses—they are all in awkward attitudes, except the "Etude de Torse" (41), which is a fine drawing in every sense. Among the best of the others are "La Psyché" (9); "Tête de Fillette" (10); "Profil de Jeune Fille" (13); "La Fleur Respirée" (18); and "Les Bagues" (38), which shows a lovely head. They form a collection of great artistic interest.

THE NEW GALLERY EXHIBITION.

The Seventeenth Summer Exhibition at the New Gallery can hardly be called a very striking one as far as the pictures are concerned, though it contains some fine and interesting works, pre-eminent among which is Mr. Watts's "Endymion" (132), a replica to a larger scale of a picture already well known; but this version is the finer work, and is in the artist's finest style of colour harmony and composition. Judged by comparison with the four others, which appear to be new works, one can hardly suppose that the "Endymion" is a recent painting, for its treatment is in every respect far superior to the others, which are not happy; indeed, the naked child coming out of the sea, and bearing the mystic title "Whence—Whither?" might provoke a smile but for respect for an intention so thoroughly in earnest. But Mr. Watts has taken now to using painting as a medium for setting forth a moral meaning, and it is a dangerous ground for a painter to take. The flight of children entitled "A Fugue" (193) is indeed a decorative rather than a moral subject—in intention at all events, but it is not very satisfying in that sense.

In figure pictures which are not portraits the exhibition is by no means strong; indeed there is nothing of real importance except Mr. Jacomb-Hood's finely-designed circular picture "The Child" (256), in which a naked infant on its mother's knee is the centre of attraction of a group of figures round it, arranged in a composition reminding one of Botticelli, though the composition is all which it has in common with him. Mr. Collier's "The Land of Dreams" (280), where two young women sit on a high foreground overlooking a wide-extended landscape, has a pleasing sentiment about it, though the figures hardly detach themselves sufficiently from the landscape, the distant shore showing nearly the same texture as their raiment; as a composition, however, it is very successful. Miss Dorothea Laudau exhibits a rather telling emblematic picture, "The Two Guests" (13), two half-length figures in profile approaching a door, one of which is Death, a cloaked skeleton, the other apparently Fame; it is an effective and poetic work. Mr. Hugh G. Riviere's "A Libation to Olympus" (222) is a clever picture of a crew of ancient Greek boatmen on a finely-painted dark sea. Mr. Strudwick exhibits one of his large allegorical pictures in Early Renaissance style, "Passing Days" (104); there is always something to enjoy in these, conventional and mannered as they are. Among smaller works should be noticed Mr. Arthur Hacker's very clever and original "study" (119), a red-haired lady in a blue dress seated in the open air, with her face away from the spectator. Mr. Byam Shaw's "Last Days at Ludlow, 1483" (220) is a clever and interesting little picture, showing the young Prince of Wales (afterwards Edward V.) and a companion (or perhaps two of his courtiers) looking from a narrow window in the castle at a landscape below, in the foreground of which are richly coloured tents and pavilions.

Of portraits there are various admirable examples. Mr. Sargent's "Mrs. Hugh Smith" (239), though not one of his great triumphs, is a fine half-length of an elderly lady, whose figure is relieved against a red curtain, and whose face is painted with great power; the rest of the picture shows the artist's usual brilliancy in treating accessories and jewellery, and his usual (or too frequent) carelessness with the hands. Among the other portraits in the same room are Mr. Collier's of Mrs. Anthony Hope Hawkins (215) and Mr. G. Henry's of Miss La Primaudaye, the latter a half-length showing a very good and refined scheme of colour, and Mr. Austen Brown's "A Chinese Cloak" (257), which is practically a portrait, and is an effective painting of a picturesque costume. In the west room are several very characteristic portraits; a head of Mr. Holman Hunt (153), by Sir George Reid; Mr. Robert Brough's portrait of Mrs. G. A. Paley, in a dark dress; Mr. J. J. Shannon's very clever and taking portrait of a child, "Joan Ratcliffe" (131); and Mr. Harris Brown's of the "Archbishop of Armagh" (201), realistic and vigorous enough, but rather a work of humour than of art. Why Mr. Arthur Hughes's beautiful and refined portrait of "Mrs. Stephen Massingberd" (373), in its framing of a flower garden, is consigned to the end of the balcony we do not understand; it is a very out-of-the-way position for such a work, but it has the advantage of standing alone instead of being brought into collision with works of a coarser type of execution, and so is better seen there, if only visitors find it out; but everyone does not ascend to the balcony.

There are several landscapes of special interest. Perhaps the most powerful and original is Mr. Pickering's "At Rest" (231), a picture of a dark wooded glen with a sunlit wood in the rear, painted in a very rich and strong key of colour; and the best and most complete of all is a small and unpretending landscape by Mr. Alfred Withers, "The Chalk Pit" (111), a work recalling the best traditions of the earlier school of English landscape-painting. Mr. Edgar Barclay's "The Druid's Tomb" and "The Squirrel" (99 and 109) are two very charming pieces of woodland scenery, the former reminding one a little of Alfred Hunt. Mr. C. W. Wyllie's "The Calm Before the Storm" (177) is a beautifully painted coast scene in which bright sunshine is about to give way to storm; and Mr. J. W. North has a large and fine work in his own manner (162), which, though beautiful, is not exactly that of nature. In the south room are some small but notable landscapes; Mr. Adrian Stokes's "November in the Dolomites" (16) and "Green Haunts and Loneliness" (34), the latter a woodland glade with a remarkably bold treatment of strong greens and bright patches of sunlight; Mr. Fred Hall's "The Fading Day" (52), a picture with a peculiar style of handling, but with a sentiment of its own; and a little work by Mr. Montague Smythe, "The Bathers" (4), a glen by the seaside, which is remarkable for its subtle treatment of tones and a unity of style which pervades the whole and gives it rank as a real work of art. Among idyllic pictures, in which landscape and figures combine, Mr. Wetherbee, the best master in England of this class of work, contributes two, of which the most important is "Œnone Forsaken" (213), a pastoral very pleasing in itself, but the figure of Œnone is hardly equal to the part—she is a mere ordinary and rather childlike shepherdess, not fit to bear a name famed in ancient romance.

There is no great work of sculpture, but among the objects in the central hall there are some of great interest and originality. There are three together, Nos. 474, 475, and 476; Mr. Derwent Wood's small-scale "Sketch for a Group of Samson and Delilah"; Mr. Dressler's life-size bronze head and bust of "A Bacchante," with a very large style about it and a fine treatment of drapery; and Mr. Taubman's rather curiously conceived life-size group "The Dance," which represents only the heads and part of the torsos of the two dancers, face to face, the interest of the work turning on the expression of the two heads, which is very fine and intense. Miss Esther Moore's "The Charmed Circle of Youth" (480) is a very poetic little work—a little nude winged figure reclining on the top of a circular pedestal, the head partially shaded by the wings. Mr. Pomeroy's bronze statue of India (481), part of a monument to Lord Dufferin, for Belfast, has a great style about it, and is an impressive piece of work. Countess Gleichen's "Memorial to Two Officers of the Grenadier Guards" is a rather remarkable design in marble, bronze, and mosaic, both decorative in effect and impressive in feeling. There is an original design for the pedestal of a sundial (501) by Mr. E. Roscoe Mullins, and among the jewellery a necklace by the Ranee of Sarawak (case 512) and one by Mrs. Bethune (No. 5 in case 513) are admirable; the latter especially an unusual and very effective design.

COMPETITION FOR CITY OF LONDON LYING-IN HOSPITAL.

The six designs submitted in the limited competition for rebuilding this hospital are now on view in the board-room of the existing building in City-road, E.C. Mr. Rowland Plumbe has acted as assessor, and we understand that the premiums have been awarded in accordance with his report. The first premium of 100 guineas has been gained by Messrs. H. H. and M. E. Collins, and the second of 50 guineas by Messrs. Charles Reilly and Son; the designs of Messrs. T. W. Aldwinckle and Son, and Mr. Wm. C. Marshall, are bracketed together for the third place, and the third premium of 25 guineas will be divided between these firms. The names of the authors of the two other designs are not stated.

The site is at the corner of City-road and Old-street, and is now occupied by the hospital erected in 1771. The existing buildings will be removed, with the exception of a low range of buildings in the rear of the site. The instructions to architects were not very explicit, and to this fact some of the differences between the designs may perhaps be attributed. The accommodation required in the main building includes store rooms, heating apparatus, disinfection, etc., in the basement; offices, waiting-room, medical officers' rooms, etc., on the ground floor; four wards for six beds each, one for one bed, and a labour ward, with the usual subsidiary rooms and matron's rooms, on the first floor; similar wards, etc., on the second floor, together with a staff nurses' sitting-room; and on the third floor an isolation ward, nurses' bedrooms, etc. The other accommodation to be provided includes a small chapel, waiting-room for 100 persons, in-patients' receiving room, midwives' room, etc. The number of drawings was restricted to six, namely five plans, and one elevation, but some of the competitors have also submitted perspectives, sections, and other elevations.

The site is so small that the whole of it can be shown on the ground-floor plan, a block-plan being therefore unnecessary. According to the instructions the limit of cost was originally 15,000*l*., but this, we understand, was subsequently raised to 20,000*l*.

Architects were informed that "the outside appearance is quite a secondary consideration, the principal features are internal planning and its suitability for the requirements." The authors of the first premiated design (No. 5) have acted up to this instruction; the planning is good, and the outside appearance has evidently been "quite a secondary consideration." It is to be hoped that the design will be so modified as to be more worthy of the situation. The planning is somewhat peculiar, but well adapted to the site. The principal entrance-hall and staircase are in the City-road front of a central oblong block, with the matron's office on the right, and the secretary's office on the left; behind these a corridor runs to the right and left, parallel with City-road, and in the rear of the corridor are a service-room, waiting-room, and porter's room. The board room is in the left-hand angle of the site, at the junction of City-road and Old-street, and behind it are the large waiting-room, midwives' changing room, linen airing room, etc., the corridor along this side being continued to communicate with the corridor of the existing range of buildings. Some of these rooms are only one story high, and the general arrangement can be more easily understood by reference to the plans of the upper floors. On the first floor the central rectangular block has the principal staircase and lift, matron's rooms, a one-bed ward, and hot cupboard in front of the corridor, and a ward kitchen, labour ward (25 ft. by

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17 ft.), and a baby washing-room in the rear. The corridor is continued at each end by means of a cross-lighted lobby to a six-bed ward, which is placed at an obtuse angle with the corridor, so that the axes of the two wards and of the central block form approximately three sides of an octagon. At each end of the central block, another corridor leads from the main corridor to another large ward, the axis of which is approximately at right angles to that of ward in front of it. The same arrangement is repeated on the second floor. On the third floor the isolation ward (27 ft. by 20 ft.) and its accessories are arranged over the right rear ward, and the six nurses' bedrooms and work-room over the central block. All the principal wards are well isolated, and the sanitary fittings are placed in towers cut off from the corridors by cross-lighted lobbies. The six-bed wards are 31 ft. long and 27 ft. wide, and all the angles are rounded off; windows are placed in the rounded angles, and along the two sides, and also over the fireplaces at the outer ends, and over the doors at the inner ends. The lobbies forming the approaches to the large wards are low, so that air can circulate between the flat roof of one lobby and the floor of the lobby above. Reverting to the ground-floor plan, the doctors' quarters are under the right front ward, and the chapel under the right rear ward; the board room under the left front ward, and the airing room, etc., under the left rear ward. The authors submit an alternative ground-floor plan, with the nurses' bedrooms on this floor, and the external appearance of this design is shown by a badly-drawn perspective. As regards the planning, the accepted design is undoubtedly the best submitted; as regards the external treatment it is almost if not quite, the worst.

The second premiated design (No. 6) is less satisfactory in plan, but is much better externally. The entrance is in the middle of the City-road front, and has a waiting-room on the left and porter's room on the right of peculiar shape; the corridor between these is continued past the doctor's office, ambulance store, and principal staircase on the left, and the secretary's two offices on the right, to a transverse corridor, behind which are the matron's office and a babies' linen washing-room. The first-floor plan again gives the key to the ground-floor arrangement; in the central block, over the rooms just described, the labour ward is in the front over the entrance and the porter's and waiting rooms (not a good position); the matron's rooms are over the secretary's offices, the one-bed ward over the doctor's office, and the baby washing-room behind the transverse corridor. This corridor is continued at each end beyond the central block by a cross-lighted lobby to a pair of wards, the axes of which form with the axis of the transverse corridor a sort of double ⋎, thus ⋗⋖. A ward kitchen is placed in the angle formed by each pair of wards. The sanitary fittings are arranged in towers, approached from the ward corridors by cross-lighted lobbies. The large wards measure 37 ft. by 27 ft., but the angles are widely splayed, so that the effective area is less than these dimensions appear to give. Windows are placed in the two long sides of each ward and in three of the splays. In the first premiated design each large ward is isolated; in Messrs. Reilly and Son's design each *pair* is isolated. The same arrangement is repeated on the second floor. The third floor is over the central block only, and the bedrooms are very small. On the ground floor the difficulties of the arrangement adopted for the wards above have proved too great for the ingenuity of the authors, and the planning of the rooms under the pair of wards towards Old-street is far from satisfactory.

Design No. 1, by Mr. Wm. C. Marshall, is bracketed third with No. 3, by Messrs. T. W. Aldwinckle and Son, but, on the whole, we consider the latter to be the better of the two. In external treatment it is certainly superior. As far as the planning is concerned, the general arrangement is somewhat similar, and there are defects in each. In neither design is there any attempt to isolate the principal wards, and this has clearly been regarded by the assessor as a serious defect. In Mr. Marshall's design the wards are better lighted; in the other the sanitary arrangements are much more satisfactory. On the first floor Mr. Marshall has a single corridor parallel to City-road, and in front of this there are two wards (one at each end), 34 ft. 6 in. by 23 ft. 9 in., the longer axes being at right angles to the corridor; between these wards there are three small rooms, namely, a baby washing-room, staff nurses' sitting-room, and a one-bed ward. Behind the corridor the main staircase, ward kitchen, sink-room, and water-closet are placed, and there are also two large wards at the ends of the corridor, and a labour ward (24 ft. by 22 ft.) in a projection at the rear. There is only one water-closet on this floor and only one sink-room, and the lobby leading to them is not cross-lighted. The same arrangement is repeated on the second floor. The matron's rooms are placed on the ground floor, and some of the other rooms on this floor are not adequately lighted. The elevation is feebly drawn and without character. The author has adhered to the instructions as to the number of drawings.

In Messrs. Aldwinckle and Son's design the two front wards are parallel to the corridor and the two rear wards at right angles to it, the arrangement being just the reverse of that in Mr. Marshall's design, but the relative position of the two adjacent wards is less satisfactory in the former than in the latter. In Messrs. Aldwinckle and Son's plan the wards are 35 ft. by 24 ft., and in each of the two front wards one of the longer sides, against which three beds are placed, is entirely blocked by the end of the rear ward and by part of the corridor, so that there are no windows between these beds. The labour ward is in front of the main corridor, which is not a good position. The linen-store and larder, which are provided near the ward kitchen, are useful, and the sanitary arrangements are more satisfactory than in some of the other designs. The ground floor is well planned, and the elevation simple and refined.

No. 4 is a charming set of drawings, and shows meritorious work, both in plan and elevation. On the first floor, the main corridor (parallel to City-road) extends the whole length of the main building, and is terminated at each end by a sanitary tower, with cross-lighted lobby. The large wards (36 ft. by 23 ft. 6 in.) are placed on each side of the corridor near the ends, so that the corridor and four wards form together a block of buildings shaped like the letter H. On each side of the central part of the corridor there is, however, an intermediate block, the front portion containing the matron's rooms and the back portion the principal stairs, kitchen, baby washing-room, labour ward, one-bed ward, hot cupboard, sink-room, and water-closet. The principal defect is the crowding of the buildings in the rear of the main corridor; the labour ward and one of the large wards are only 3 ft. 6 in. apart, and the other rooms are only 14 ft. from the wards. On the ground floor the crowding is still more marked. The second floor is similar, but with the staff nurses' sitting-room and work-room over the matron's rooms. Externally the whole of the ground story is of plain stone, without plinth or cornice, except at the entrance in the centre of the principal front; the next story is entirely of brick, with the exception of stone dressings to the six windows in the central portion; the next story is of brick with stone bands; and the central portion is carried up another story in a similar manner. The water-colour perspective is an excellent piece of work. Probably, this design has failed to secure a premium on account of its costliness.

Design No. 2 is clearly out of court. The construction is faulty to a serious extent. There are half-brick walls, about 30 ft. long, between the cross walls, and carried up through three stories. Many of the 14 in. external walls on the third floor are not over walls below, and in one case a girder with a clear span of 48 ft. would be required, and one end of the girder would come over a window. There are other defects in the planning, as in the arrangement of the entrances and corridors on the ground floor, but it is unnecessary to describe them in detail.

We were not permitted to see the reports which accompanied the designs, and are, therefore, unable to give the authors' estimates or to describe the methods of heating and ventilation which they suggested.

TOWN HALL FOR LAMBETH.—At the meeting of Lambeth Borough Council on Thursday of last week (April 14) it was resolved to erect a town hall on a site at the corner of Acre-lane and Brixton-hill. The President of the Royal Institute of British Architects is to be asked to appoint an assessor.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at the Rooms of the Institute, No. 9, Conduit-street, the President, Mr. Aston Webb, R.A., in the chair.

The Registration Question.

The Chairman: Before asking Mr. Prior to read his paper I have just one or two remarks to make in reference to a matter which rather closely concerns the affairs of this Institute. It will be known to you possibly that a committee consisting of certain members of our Institute have issued a circular asking the opinion of members on the subject of registration. I think it only right to mention that when the committee of this Institute which has been appointed on registration met the question arose as to the circular which was proposed to be issued asking the members of the Institute whether they were in favour of registration or not, our committee thought that it would be very unwise to prejudge this question by a circular in the first instance, and practically they unanimously expressed the opinion that it was undesirable that any attempts should be made to prejudge the question in this way. This was not formally communicated to the outside committee as had been intended, but there were several members of the committee present who, we understand, did informally communicate it to their committee. But I am sorry to say that in spite of this strong expression of opinion—practically unanimously made—an appeal has been issued to members asking for their opinion on this question before the committee appointed have had time in any way to lay before the members of our body their opinion of the pros and cons of the question. We are all quite willing it should be carefully considered, and a report drawn up as to the merits or the demerits of the proposal which has been made. I am informed by the chairman of that committee that the notice was sent out through some misunderstanding amongst the members of the committee itself. But the council feel that in a matter of such importance as this there should be no carelessness about the issue of such a circular. Three members of the committee—Mr. Seth Smith, Mr. Wimperis, and Mr. Guy Dawber—have, I understand, since resigned from the committee, and I hope that other members will show their sense of the unfortunate occurrence by doing the same, for it really makes the consideration of the question very difficult if it is to be treated in this way. The council think it only right that I should mention this matter at the first opportunity before the members of the Institute. Perhaps you will allow me, as I am on this question, just to give one little hint on my own account. You will have the question of the election of the members of the council for the coming year shortly before you, and the responsibility rests on every one of us to vote for the best men to represent the profession on the council, and I hope they will consider not only this question of registration, but also the general qualifications of each man to best represent us on the council.

The Statues of Wells.

Mr. E. S. Prior, M.A. Cantab., then read a paper on "The Statues of Wells, with Some Contemporary Foreign Examples," of which the following is an abstract:—

The statues of Wells front, said the author, have escaped the chances which have been almost everywhere destructive to mediæval sculpture—they have not been largely defaced by iconoclastic or political riot; they still possess their heads, arms, and their main features unbroken; the face of the stone has not completely perished as so much of English building stone has done, and in the pure air of a West country town it has been but little coated with dirt; and, as a crowning mercy, they have not been "restored" away by the "restorer." They belong to that fresh, early period of Gothic art when its expression seems to leap upward like a flame; when in the heat of it art ran molten into the moulds of new motives, when the image and superscription that for the thousand years of the Byzantine dynasty had been the currency of art was in a couple of generations entirely coined afresh, minted, as it were, for

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the Gothic dynasty. We can see in the Wells statues the genesis of a dominant art, the triumphant progress that marks the creation of a great style, till in the latest and best of our Wells figures has been reached the highest level of the English accomplishment.

The author explained that his intention was to develop certain views upon one aspect of the Wells statues which circumstances had brought to his notice. The scaffolding recently erected had given opportunity of observing at close quarters not only the matter of the portrayal, but its manner; and Mr. Arthur Gardner had made photographic studies of certain features which he (Mr. Gardner) would presently put before the meeting. As a preliminary, the author briefly surveyed the points they wished to develop.

The art of the statuary in stone is the art of his chisel. His craft lies in the edge of the chisel or other implement with which he shapes and models his stone. The author's point was that the consideration of that use of the chisel gives the key to the history of English sculpture. In the simple action of cutting stone lies a world of diversity in which can be clearly mapped out territories of style. Even in the plain dressing and walling of freestone, the date and style of the masons were expressing themselves all through the Middle Ages, and this expression can be traced from one period to another by the variations in the finishing and setting of the stone employed. Fully as expressive of date and style is the signature of the figure sculptor in his use of the chisel point upon his statue; it is the expression of his time; it shows a growth from one stage of execution to another, exhibits certain peculiarities arising from the phases of his craft, from the traditions of his age, from the texture of the stone he uses, from the commerce and connexions of the habitat in which he works. His chisel conventions are the nature tongue of the sculptor. From the consideration of them we may say he is Englishman, Frenchman, Italian, or German, that his craft has grown up in the works of this or that stone, that he was living at a certain date, and had, in fact, a certain position in the history of English, French, Italian, or German art.

The building of Wells Cathedral was the work of sets of masons who began in the XIIth century and carried on what was practically a continuous succession of stone-cutting craft, culminating in the statues of the West front, and leading on in them from step to step of progress until the highest attainment was reached. The combination in the building of oolite in wall and arch-moulding, with limestone shafts, makes a distinct and peculiar sub-species of XIIIth century mason-craft. It is distinguished by certain peculiarities of moulding in arch moulds and capitals, and by not having its wall stone dressed with the notched chisel. It occurs at Sherborne, Gloucester, and Exeter, but its great accomplishment was the West front of Wells, and it was in connexion with its style that the great statue-making of the front was achieved.

The author proceeded to trace back this XIIIth century style of figurework to its early beginnings, showing how the free statue in stone grew up without any special effort in the Wells building. The head expression had been long in practice for label and corbel; the full relief and the attitude of a statue had by 1220 been for some time in the ambitions of the carver of recumbent effigies, by 1220 the draperies had made their expression in the ordinary architectural carving of the mason. Nor was the motive of this great enterprise of setting up ranges of life-size saints any sudden and new idea. Life-size free-standing images had—from the Xth century, at any rate—been in the habit of English art. The manner of such representation was part of the ordinary church fitting of the time. But this statue-making was goldsmith's work—adapted for the niches of an internal screen reredos; the new thing was that the Wells figures were stonemason's work. When the mason's skill had reached that power of carving the human figure which the building of Wells gave him, immediately the project of using his powers to furnish the great iconostasis of stone, which the west front of Wells is, would arise and would be in the natural functional development of English Gothic style.

Exhibiting the statues by slides, the author put them into groups to show their successive stages of development, and to bring out the evidence of a peculiar Wells technique which was a distinctly native possession, growing out of the Wells building, and declaring itself as the production of no foreign hand. In a figure remaining at Winchester the Wells manner could be seen carried a stage further. The distinctness of the Wells treatment would display itself beside other English work, contemporary or nearly contemporary, at Westminster and Lincoln. Yet in them all—at Wells, Westminster, and Lincoln—will be seen a general flavour, a generic likeness, which seems to be evident under the distinctions of species in the three. To emphasise this point the author referred to contemporary work abroad. Despite similarities and often identities of the subject of statue-making, despite the likenesses of treatment as to the characters represented, despite the close parallelism in the conditions of the sculptors, abroad as in England working up from Romanesque traditions in stone-cutting to the accomplishment of Gothic ideals, the handling of the English work shows as distinct from that abroad. There is a generic French manner displayed at Chartres, Amiens, and Rheims, which, just as our English generic manner had its own varieties, so in the sculptural development of each of these three cathedrals developed a particular specific technique that can in each case distinguish them.

The author's conclusion was that the Wells statues were a production of English art, not, as much assertion has declared them, the work of any foreign sculptor. For as it can be clearly seen that neither the sculptors of Westminster nor Lincoln carved figures like those of Wells, so equally must those of Chartres, Rheims, or Amiens be acquitted of having had a share in them.

Mr. Arthur Gardner supplemented the paper by showing on the screen specimens of work at Chartres, Rheims, and Amiens, contemporary with that of Wells Cathedral. Most of the views were taken by himself, but some he explained had been lent by Professor Letheby. He endorsed the conclusions of Mr. Prior that the work at Wells was essentially that of English workmen.

Mr. St. John Hope said he was so thoroughly in accord with all that Mr. Prior had said, that he had really little to add on his own account. With the view that the origin of these figures was English he was in entire agreement. It was only a few weeks back that he had the opportunity of showing photographs of those wonderful figures from Wells to Le Comte de Lasteyrie, and of asking him whether they had anything of the kind in France or any work like that which would justify those who claimed a foreign origin for some of them, and he said at once that there was no French influence in them and that they were thoroughly English. With that opinion he thought they might rest content, and hereafter they ought to have nobody putting forward any claim for the foreign origin of these wonderful sculptures. It was rather exasperating to take up guide-books and find that the so-called authorities had set down all of the fine work in this country to foreigners, and yet when they come to make a comparative examination of one work with another, and when they went to those absolutely undeniable authorities—documents—they found that these so-called foreign works were almost always the work of men who bore English names and whom they had no reason to suppose were other than Englishmen. He was dining not long ago in the Hall of Magdalen College, Oxford, and was looking at the beautiful panelling at the back of the high table, and he asked one of the Fellows who had studied the question whether he found any reference in the college accounts to the men who produced this very charming Renaissance work. He afterwards received from this gentleman extracts of various entries which showed that the timber was sent from London to Oxford, and was carved in Oxford by Englishmen. The accounts showed that this wonderful work was the work of English artists, and not that of Italians or Flemish artists who were tainted with Italian traditions. Mr. Prior and Mr. Gardner had shown by their interesting comparative examinations how very clearly the Wells images stood out from anything else as being a product of our own country. He had been over these figures several times with Mr. Prior and Professor Lethaby on the scaffolding, and their views were thoroughly in accord.

Professor Lethaby said he did not think he differed from Mr. Prior in the minutest detail. Mr. Gardner had mentioned the Founders statues at Chartres, but he believed the most recent opinion was that all these things were really saints and scriptural people. Although they were referred to as Queen Matilde and King John, and so on, later opinions held them to be statues of David and Samuel, and other biblical persons. One thing he would suggest was that those in search of a holiday should go to Rheims this year, for the scaffolding was being placed round the Cathedral front, which stood out beyond anything else in Europe, except St. Mark's, at Venice—the latter, of course, from an entirely different point of view. When that scaffolding came down no one knew what they would see.

Professor Beresford Pite, in proposing a vote of thanks to Mr. Prior and Mr. Gardner, said the paper had been most interesting, as it had renewed the acquaintance he made many years ago with the sculptures at Wells. To architects there was a very great and delightful element of beauty in Wells front. There was an extraordinary contrast of the forms of the sculptures, and yet their harmony with the columns and shaftings was of very great value as an element of design, and it was altogether charming to be told by Mr. Prior that the forms of the mouldings linked themselves with the sections so thoroughly. There was something fascinating in the idea that he did not think they would readily forget. The design of these sculptured fronts was very interesting. One had been rather compelled to the thought that the architectural design had been subordinated to the story or poem intended, and he always felt that very strongly at Wells, and he did not know that they had any indication from Mr. Prior of the story which had led to the creation of this delightful series at Wells. The biblical series below and the series above were didactic in a high degree, and one expected that the figures in between had some story and meaning and order and ratio which defined to a great extent the limits of the original design. Unfortunately Salisbury was not what it was, but they saw in Peterborough and Lincoln façades laid out for sculptural representation, and he could not accept the feeling that the mere architectural arrangement of niches was designed by one man, and then that a group of sculptors were called in to fill them, accidentally sometimes, with scriptural figures. He had a strong idea that very much the same planning as in the subject matter of a great stained glass window underlay the subject matter of these great fronts. They had been told that Mr. Hope would solve the mystery and puzzle, but he had acquiesced in Mr. Prior's views in a very disappointing way. There was undoubtedly at Wells great originality on the part of the designer, for the designer had cut himself free from a good many traditions and thought for himself. With reference to the gable, for instance, he had no recollection of any similar form in England, and he did not know but what it was altogether unique. It was certainly very remarkable and peculiar, and very exceptional in stone, and he supposed that it was always the intention to erect western towers. Some such idea or design must have been in existence when the lower part of the front was planned. At about the same time they had Peterborough with great originality of treatment, and there was also Salisbury and Lincoln. He believed that Hugh de Wells also did work at Lincoln. In these fronts there was the same great movement in the direction of originality of treatment at work amongst English church architects at that time. It was a matter of very great interest, and there was no doubt that Wells was one of the finest examples of that movement.

Mr. H. Stannus seconded the motion, and said that to try and explain the storiation of this west front would be rather a large order at that hour, and moreover the reader of the paper expressly explained that this scheme of storiation was being carefully worked out by two friends of his, and he (Mr. Stannus) trusted that they might have the opportunity of reading about it later on. There were two thoughts which struck him very strongly while looking at the delightful series of views. One point was, "How very like the development of Greek art they were." He could parallel every stage of the development from photographs that he had, beginning with archaic statues dug up in the recent excavations of the Acropolis right down to the group of the "Three Graces,"

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or whatever it might be that they had in the British Museum, that led one to feel that all great art was one. They saw that development shewn in the drapery by the parallel lines and then the zig zag folds what they saw so strongly marked in archaic Greek work. Later on the folds became larger and of greater variety, until they come to the noble work of Phidias, which, he ventured to say, could really be paralleled by some of the work they had seen on the screen that evening. It was many years ago that someone made the remark that there was the same character in transverse sections of folds of Greek drapery as the transverse sections of Greek mouldings. He was glad that had been shown with the Cathedral mouldings. It was another proof if one were needed that the sculpture was not imported and put there, but was really made on the spot; like all great art made for its place, and probably in some cases in its place. If he were to criticise, he would draw attention to the great want of repose there was in the front at Wells. And there was another parallel which occurred to him in the front of the Certosa near Pavia. He thought the design at Wells would be a stronger one if the general scheme of decoration of the whole front had not been carved right across the buttresses.

Mr. Dressler said Mr. Prior had led him to understand that this was a lecture on archæology, but he felt it was a lecture on most beautiful art. He very much admired Gothic art, although he was trained more in the classic, but before Mr. Stannus got up he was thinking of the great similarity there was in Gothic art and classic art, and he also quite agreed that there was a natural development, and that the first effort of all sculptures had been to imitate architectural forms. They saw long form-like columns, with lines on them very much like the Corinthian column, and by degrees they saw the efforts of the artist to bring life into them and to make the arms far away from the body, and so on. His general interest in all these things was that of the modern man. Archæology was very interesting, but the great thing was how they were to derive any benefit from it, and how they were to get the beauty of the times gone by. He did not propose to attempt to solve that question. Everyone would be delighted if opportunities such as the old sculptors had were given to sculptors to represent themselves on the face of fine buildings rather than in producing work which could only be placed inside or placed in public places for which they were never intended. They all desired to associate themselves once more with the fine buildings of the time, but how it was to be done he must leave it to others to say.

The Chairman said they were all evidently agreed with Mr. Prior in thinking that these statues were the work of English sculptors. Call them sculptors if they would, but he understood that probably these men were really superior masons. They were men who worked on the fronts of the building and by degrees through their increased skill were entrusted with the figure work of the building. They must have grown up with it and have known every portion of it, and, as had been pointed out, were so engrained with the architecture of the building that their figures were almost unconsciously affected by the mouldings by which the figures were surrounded. They, as architects, looking at the illustrations, would feel how wonderfully the figures did blend with the architecture. He was quite sure that they as architects would be only too glad to find sculptors who would blend their work with the architecture. How that was to be achieved he did not know. Sculptors had a way of working in their studios while architects had to work out of doors, and thus it was that the statues of the sculptors when placed on a building did not always accord with the work of the architect, in the same way as they did at Wells Cathedral. Of course it really arose from the different conditions under which their work was now done. He supposed it was no good trying for the impossible, and to expect sculptors to come to work on the building and carve the figures there. It was a question, however, which affected both architects and sculptors. He was sure they all had the desire to employ sculpture in their buildings but there was that difficulty of assimilating it without the intimate knowledge which the sculptor certainly should have of the building before he put a figure into a niche.

The motion was then heartily agreed to.

Mr. Prior, in reply, said he could not help it that everyone had professed agreement with him. It was not often when he made any statement that that had happened so that he could only suppose that a peaceful atmosphere reigned in the Institute, and troubles never entered. He was thankful, therefore, to be able to agree with so much of what Mr. Stannus had said, and particularly when he pointed out that it would be rather a large order to go into the question of the meaning of Wells front as Professor Pite suggested. He would require ten lectures to venture to deal with such a subject. Neither would he be led into the very burning question of how they were to get any decent sculpture on to modern buildings. How was the Academy sculptor to appear upon their buildings as the Wells sculptor did? He could only say it would happen when the Academy was abolished.

The Chairman announced that the annual meeting would be held on May 2, when the annual report and accounts would be moved for adoption, and the usual business of the meeting be transacted.

A REMINISCENCE OF THE LATE PETER PAUL PUGIN:

BY ONE WHO KNEW HIM.

THE late Peter Paul Pugin, who was the third and youngest son of the late Augustus Northmore Welby Pugin, the distinguished Gothic revivalist, was born on St. Peter and St. Paul's day 1851. He was, therefore, but fifteen months old at the death of his father, which took place on September 14, 1852. Notwithstanding this, any one speaking with him respecting his father, found it extremely difficult to imagine that he was dealing with something that could but have been hearsay, albeit of the most reliable nature. His mother, who is happily still living, had the most devoted admiration of her distinguished husband's attainments—an admiration and appreciation that nearly fifty-two years widowhood has not dimmed in the slightest degree. A conversation with her is such an interesting connecting link with the past, that it is a privilege to be remembered; so vivid is her recollection of everything pertaining to the husband to whom she was such a devoted wife, that the subjects of her conversation seem to be but the events and persons of yesterday. It was in an atmosphere such as this that Peter Paul Pugin was brought up, with the only possible result to a devoted son of a devoted mother—an admiration for all that she admired and a love for all that she had loved—and thus it was that at the death of his eldest brother, Edward, in 1875, he was able, with his brother Cuthbert, to undertake the management of an important and extensive practice. This was the more remarkable as to within a few years of his brother's death he was being trained as a painter, and it was only after mature consideration that he decided to forego painting and take up architecture in earnest. His earlier training was of an essentially practical nature; amongst other matters, he had superintended the erection of the block of buildings at Ramsgate, now the Granville Hotel, while he spent some time at the carpenter's bench. Thus his training was a peculiar combination of the practical and the artistic, his freedom with the pencil standing him in good stead in designing, especially in the more elaborate work, such as altars, where he could with equal facility sketch in the carving, figures and tracery, which accounted for a good deal of the charm in his work; nothing of this nature being left to the carver, as is unfortunately so often the case.

Mr. Pugin was all his life a most pious and devoted Catholic, and it was not necessary to be of the same faith to thoroughly appreciate his sincerity, his every-day life being a speaking tribute to his truly Christian character; and it is a most pleasing retrospect to remember that his virtues were appreciated during his life by all who came into contact with him. It gives great pleasure to the writer to record the fact that in every part of the country he heard the kindliest expressions of regard from the highest to the lowest of those who had any association with him in his many works, both from the clients' and the builders' side. One incident comes to the writer's mind which will illustrate this. Some months before Mr. Pugin died, in fact when, although he was somewhat ill, there was no thought of his death, a builder with whom he had business (not a Catholic) said, "There is one thing I always feel after leaving Mr. Pugin, and that is, that I have been with a much better man than myself." There was something so essentially gentle in his nature, and a certain touch of simple domesticity in his character, that one who met him frequently would find himself taken behind the business man, and would see the affectionate husband and father; so that, busy man as he was, he always had a thought for those nearest and dearest to him.

It has often been remarked to the writer by Pugin's various clients that his work always had a strong devotional character, that his churches were places they felt they could pray in. Those who knew him best could quite understand from the man and his work the truth of this, and it is a striking tribute to his character that his piety appealed to all who had association with him, irrespective of creed.

Notwithstanding his gentle and kindly nature, the lot of any one who attempted to take advantage of this to the detriment of his clients' interest was not to be envied, as one or two individuals found to their cost. However, it was Pugin's lot generally to get builders and workmen around him who entered enthusiastically into his work, so that the relationship of all concerned remained on the most happy footing.

One of the objects (apart from the wonderful collection of his father's original sketches) he had the greatest pleasure in showing, was his badge of the Order of St. Sylvester, bestowed upon him by the Pope for his services to the Catholic church in England, a compliment well deserved; his devotedly religious spirit giving him far more than a merely professional interest in his work, and which accounted for the devotional spirit manifested in his churches.

In this appreciation the writer has dealt rather more with the personal character than would be the case generally, but Pugin's practice was almost exclusively confined to the church, of which he was so devoted a son, and his relationship with his clients was of a somewhat exceptional nature from the religious spirit pervading both sides.

The traditions of the name of Pugin will be continued by his brother Cuthbert, and his nephew, Mr. Sebastian Pugin Powell, who was trained by him, and had been associated with him for the last twenty years.

THE BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE twenty-fifth annual dinner of this Institution was held on Tuesday evening in the King's Hall, Holborn Restaurant, Mr. F. G. Minter, President, in the chair. There were also present Messrs. J. C. Amph'ett, H. G. Assiter, E. H. Boehmer, R. Barrett, C. H. Brodie, E. Brooks, Chatfeild Clarke, Max Clarke, T. Costigan, H. T. Desch, E. B. Gammon, A. Grimwood, D. Mackness, F. S. Oldham, H. W. Parker, A. Ritchie, F. J. Smith, B. G. Thompson, R. Tarring, J. Whitty, C. Wicks, J. Austin, secretary, and others, the company numbering over 400.

The loyal and patriotic toasts having been honoured (Mr. Carter proposing, and Mr. Whitty responding to, the toast of "The Imperial Forces"),

The Chairman gave the toast of the evening, "The Builders' Clerks' Benevolent Institution." The Chancellor of the Exchequer had that evening deplored the depression in the building trades, but could he have been in the King's Hall and seen that large gathering, he would perhaps have thought that he had made a mistake. Such a large gathering showed how great an interest was taken in the Institution, which was founded in 1866. With them that evening they had one of the founders, Mr. E. Brooks, who had taken very great interest in the Institution, and Mr. Mullett, the original secretary. The objects of the Institution were to provide pensions for distressed and aged clerks and their widows, and to give temporary relief to them and to educate and maintain the orphans. At the present time there were twenty-four widows in receipt of 24*l.* a year each, and one aged clerk in receipt of 30*l.* a year, while there were two children being maintained at the Orphan School, at Haverstock-hill, Hampstead, and there was a vacancy for another. The grant of temporary relief was part of the good work the Institution was doing, and it was felt that small amounts given at the right time often saved a clerk from permanent distress. The first year the Institution was started 112*l.* 15*s.* was expended; latterly they had been disbursing from 600*l.* to 700*l.* a year

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in these benefits, and the good that had been accomplished was very great. They had in hand between 6,000*l.* and 7,000*l.* in stocks, and they had bought three presentations of 250*l.* each to the Orphan School at Haverstock-hill. They wanted to raise 500*l.* in order to continue their work and to put the Institution on a sound financial basis. The cost of management was very slight, and when they remembered that Mr. Brooks was their treasurer they would know there was no waste. Nearly all the money raised was expended on decayed clerks or their widows, and he did not know of any other Institution that was managed so economically. He thanked all those who had given help, but he must add that he did not think the builders had so far done all they should. He thought, too, that builders' clerks themselves might do more to help the Institution than they were doing. More of them could subscribe, and it was surprising that they did not. By paying a guinea subscription they obtained ten votes, and for every guinea subsequently paid they obtained ten votes. The votes were carried forward, and a candidate could practically vote himself in after one or two applications and after a certain age, and secure 30*l.* a year for life. Owing to bad times the donations had fallen off, and unless they sold their stock, which they did not want to do, they must raise 500*l.* this year.

Mr. Brooks, hon. treasurer, suitably responded and referred in complimentary terms to Mr. R. Barrett, who had induced a number of builders' clerks to become annual subscribers.

Mr. H. Le Marchant then briefly proposed "The Architects and Surveyors," coupled with the name of Mr. H. G. Assiter.

Mr. Assiter, in reply, spoke of some able and practical builders' clerks he had come in contact with. He also referred to a movement in the Surveyors' Institution "to improve the position of the quantity surveyor and put him on a better footing."

Mr. Max Clarke, in proposing the toast of "The Builders," said he had lately done a large amount of work without the intervention of the builder, and he had acted as the builder and the clerk of the works. Consequently he could sympathise with both, and he had had an experience that he did not wish to go through again. The builder was the man whom the architect wished to make use of as much as possible to save him such trouble as he (the speaker) had lately discovered to be so great. He had found that builders were honest, and that they kept their word and carried out the unfortunate and sometimes unnecessary impositions put upon them.

Mr. A. Grimwood, whose name was coupled with the toast, replied and said he was a builder of thirty or forty years' standing, and that he represented a firm which had been established something like a century.

Mr. Oldham then proposed the toast of "The Builders' Merchants," coupled with the name of Mr. R. Barrett, who, in reply, said it needed very little trouble to get the builders' clerks to subscribe to the funds of the Institution if the matter were placed before them properly.

Mr. T. Costigan, secretary of the Master Builders' Association, then ably proposed the toast of "The Chairman," who suitably responded, and the proceedings terminated.

During the evening the energetic secretary announced that the list of donations and new subscriptions so far received amounted to 350*l.*

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the Building Act Committee of the London County Council held on March 28, being the day before the Council adjourned for the Easter Recess, the proceedings were governed by the clause in the order of reference which empowers the Committee at certain seasons to act on behalf of the Council in relation to matters included in the Committee's order of reference. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Marylebone, East.—Buildings upon the site of Nos. 162 to 188, Great Portland-street, St. Marylebone (Messrs. Boehmer and Gibbs for Mr. T. Wharrie).—Consent.

Chelsea (detached).—A dwelling-house on the western side of East-row, Kensal-road, adjoining the "Great Western" beer-house (Mr. J. R. Sims).—Consent.

Clapham.—Residential flats on the west side of Lavender-sweep, Battersea, between No. 30, Lavender-street and Limburg-road (Mr. W. H. George).—Consent.

Hackney, North.—Bay windows in front of No. 167, Queen's-road, Finsbury-park (Messrs. Warran and Stupart for Mr. F. W. Wright).—Consent.

Hackney, North.—A one-story building at the rear of "The Swan" public-house, Clapton-common, Hackney, to abut upon Braydon-road (Mr. J. Hamilton for Messrs. Garwood and Sons).—Consent.

Marylebone, East.—Oriel windows in front of Nos. 16 and 17, Union-street, St. Marylebone (Messrs. Clark and Boulting for Mr. T. J. Boulting).—Consent.

Mile-end.—One-story shops on part of the forecourts of Nos. 12 and 14, Devonshire-street, Mile-end (Messrs. Leatherdale and Moore).—Consent.

Paddington, South.—An iron and glass portico at No. 89, Lancaster-gate, Bayswater-road, Paddington (Mr. G. Melville for Mr. H. M. Hogan).—Consent.

Strand.—A clock turret at No. 41, Great Windmill-street, Piccadilly (Mr. W. Whiddington).—Consent.

Wandsworth.—A house on the west side of Gwendolen-avenue, Putney (Messrs. J. T. Wimperis and Arber for Mr. W. R. Williams).—Consent.

Woolwich.—One-story shops on part of the forecourts of Nos. 27A and 27B, Herbert-road, Plumstead (Messrs. A. H. Edward and Co.).—Consent.

Width of Way.

St. George-in-the-East.—Buildings at Nos. 13 and 15, Denmark-street, St. George-in-the-East, with external walls at less than the prescribed distance from the centre of the roadway of the street (Messrs. F. Chambers and Son for Messrs. Keen, Robinson, and Co.).—Consent.

Width of Way, Lines of Frontage, etc.

Greenwich.—Buildings and a bridge at the Greenwich generating station, next the public footway adjoining the river Thames, and abutting upon Old Woolwich-road and Hoskins-street, Greenwich (Mr. E. J. Edwards for the Highways Committee of the Council).—Consent.

St. Pancras, East.—Stables and stores in Aldenham-mews, Aldenham-street, St. Pancras (Mr. G. H. Luetchford for Mr. R. L. Cripps).—Consent.

Kensington, South.—Buildings on a site upon the east side of Silver-street, and three buildings upon a site abutting on the south side of The Mall and the west side of Lucerne-mews, Kensington (Mr. W. M. Weir for Messrs. H. and T. Harris).—Consent.

Line of Frontage and Construction.

Rotherhithe.—An iron gangway to connect premises on the north and south sides of Shad Thames, Rotherhithe (Messrs. Gelder and Kitchen for Messrs. A. and P. Keen).—Consent.

Width of Way and Construction.

Greenwich.—The retention of a wood and iron van-shed in the garden at the rear of No. 67, Maryon-road, Greenwich (Messrs. Church, Quick, and Whincop for Mr. S. Long).—Consent.

Greenwich.—A shed at the "Anchor and Hope" wharf, Riverside, Charlton (Messrs. H. Castle and Sons, Ltd.).—Consent.

Deviation from Certified Plan.

St. George, Hanover-square.—Deviations from the plans certified by the district surveyor, so far as relates to the rebuilding of No. 94, New Bond-street, St. George, Hanover-square (Mr. W. J. Ancell for Messrs. J. Lyons and Co., Ltd.).—Consent.

St. Pancras, South.—Deviation from the plans sanctioned in respect of the erection of a building on a site on the southern side of Tottenham-street and eastern side of Charlotte-street, St. Pancras, so far as relates to an extension of the waiting-room on the first floor (Mr. F. T. Verity for Mr. E. D. Maddick).—Consent.

Strand.—Deviations from the plans certified by the district surveyor, so far as relates to the proposed rebuilding of Nos. 61, 62, and 63, Jermyn-street, Piccadilly (Mr. W. Woodward for Messrs. White and Co. and Mr. F. Sweetland).—Consent.

Space at Rear.

Westminster.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the south side of Great College-street, Westminster, with an irregular open space at the rear (Mr. A. B. Jackson for the Governing Body of Westminster School).—Consent.

Lines of Frontage and Space at Rear.

Hackney, South.—A building on the north side of Atherden-road, Clapton, between Rushmore-road and Alfearn-road (Mr. C. W. Hodgson for Mr. H. Pyle).—Consent.

Cubical Extent.

Woolwich.—An addition to a gutta-percha covering shop at the works of Messrs. Siemens Brothers and Co., Ltd., Harden's-manorway, Charlton, which building together with such addition will exceed in extent 250,000, but not 450,000, cubic ft. (Messrs. Siemens Brothers and Co., Ltd.).—Consent.

Newington, West.—The erection at Falmouth-road, Great Dover-street, Newington, of an addition to a building exceeding in extent 250,000 cubic ft., such building and addition not to exceed 450,000 cubic ft., and to be used only for the purposes of the manufacture of lifts (Mr. H. H. Collins for Messrs. R. Waygood and Co.).—Consent.

Formation of Streets.

Lewisham.—That the application of Mr. D. G. Horlock for an extension of the period within which Normanton-street, Perry-vale, Forest-hill, was required to be clearly defined throughout and thrown open to the public as a highway be granted.—Agreed.

Woolwich.—A deviation from the plans sanctioned for the formation of new streets upon the Eltham-park estate, High-street, Eltham, so far as relates to an alteration in the gradient of Dumbreck-road (Mr. R. Stewart for Mr. A. Cameron Corbett).—Consent.

Wandsworth.—That an order be issued to Mr. W. Bartholomew sanctioning the formation or laying out of new streets for carriage traffic on a site on the north-west side of Church-lane, Tooting.—Agreed.

Wandsworth.—That an order be issued to Mr. W. Bartholomew sanctioning the formation or laying out of new streets for carriage traffic out of the south-east side of Franciscan-road, Tooting, opposite Totterdown-street.—Agreed.

Means of Escape at Top of High Buildings.

Kensington, South.—Deviation from the plans approved in respect of the means of escape in case of fire proposed to be provided on the sixth and seventh stories of Nos. 63 to 83, Oakwood-court, Addison-road, Kensington, so far as relates to the provision of external gangways from the windows of certain back rooms to certain windows on the sixth and seventh floors in lieu of doorways being constructed between the hall and such rooms (Messrs. Rolfe and Matthews).—Consent.

St. George, Hanover-square.—Means of escape in case of fire proposed to be provided on the topmost story of No. 7, Seamore-place, Park-lane, St. George, Hanover-square (Mr. J. A. Tregelles for Sir J. L. Mackay).—Consent.

Alteration of Buildings.

Strand.—A building on the west side of Portugal-street, Lincoln's Inn-fields, upon part of the open space belonging to the George IV. public-house, Portsmouth-street (Messrs. Ridge and Waymouth for Mr. O. Owen).—Consent.

Dwelling-houses on Low-lying Land.

Camberwell, North.—Three dwelling-houses on low-lying land situated at Elmington-road, Camberwell (Mr. S. Walter Wells for Mr. A. Burton).—Consent.

Hampstead.—A building on a site abutting upon Streatley-place, Murray-terrace and Newend, Hampstead, with a forecourt fence at less than the prescribed distance from the centre of the roadway of Streatley-place (Mr. W. S. Cook for the School Board for London).—Consent.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The annual meeting of the Sheffield Society of Architects and Surveyors was held in the Lecture Hall of the Literary and Philosophical Society, Leopold-street, on the 14th inst., Mr. T. Winder presiding. The annual report of the Council was presented and approved. It stated, in regard to membership, that the total number in each class was now three hon. members, 35 Fellows, 42 Associates, 17 students, and 20 lay members; total, 117, compared with 109 last year, or an increase of eight members. Seven other gentlemen also are nominated for election at the next meeting. With regard to public matters affecting the interests of the profession, the time of the Council had been fully occupied during the year. No further action had, to their knowledge, been taken with regard to the new building by-laws, and the Town Clerk had promised that the Society shall have a further conference with the Highway Committee when the matter is again considered. The proposed competition in connexion with the Corporation

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building scheme at Wincobank, referred to in the last report, had been carried out, but upon the facts being put before the assessor and the Council of the R.I.B.A., the assessor appointed refused to act, and the R.I.B.A. sent out a circular to its members and to members of allied societies, asking them not to compete. In consequence of this an assessor was appointed by the City Council who was not a member of the R.I.B.A. or the allied societies, and the Corporation accepted a design which does not comply with their own building by-laws. The Council deeply regret the action of the Corporation in this matter, as by violating the established traditions of architectural practice they made it impossible for members of the R.I.B.A. or the allied societies to compete, and consequently the city lost the benefit of much valuable experience. The Society's Council had approached the Free Libraries Committee of the City Council and suggested the proposed library at Walkley should be thrown open to public competition. The conditions were discussed, and in part amended, and although not quite so satisfactory as in the case of the Westbar Fire Brigade Station, they were on the whole acceptable. In another local though limited competition, one of the members was appointed assessor, and in a competition now pending another member had been similarly appointed. The position of the Society had also been recognised by the request of the Ilkley Urban District Council to the Council to advise them on the appointment of an assessor in their competition for new public buildings. The question of a proposed University for Sheffield had been considered, and the following resolution was unanimously agreed to: "That the Council of the Sheffield Society of Architects and Surveyors is of the opinion that the establishment of a University for Sheffield would prove highly beneficial to the professional and educational progress of the city and district, and that the Society cordially supports the petition of Sheffield University College for the grant of a University charter." A letter had been received from Councillor A. Harland, asking the Society to contribute towards the funds of the new University College buildings, and as the Society had no funds available for the purpose it was recommended that members who subscribe should request that the amount of their subscription shall be applied to the architectural department. The Master Builders' Association had recently opened the question of the contract agreement form, and the matter was still under the consideration of the Council, who will report to the members of the Society in due course. On February 26 last, a deputation waited upon the Council from the Master Plumbers' Association in connection with the question of the supply of fittings. After hearing the views of the deputation, who urged the desirability of all fittings being ordered through the plumber instead of, as in many instances, being ordered direct either by general contractor, the architect, or the owner, the Council decided to refer the matter to the annual meeting of the members of the Society. They recommended that prime costs sums should mean the actual net cost, and that in all instances profit and fixing should be inserted in the quantities as separate items. The library accounts show a balance in hand of 8*l.* 6s. 3d. The Society's accounts show a balance in hand of 24*l.* 16s. 7d.—The following gentlemen were elected the officers and council for the ensuing year:—President, T. Winder; Vice-President, E. Holmes; Treasurer, F. Fowler; Secretary, W. C. Fenton; Council, the past Presidents, and Messrs. (Fellows) W. J. Hale, H. L. Paterson, J. R. Wigfull, J. B. Mitchell-Withers, H. Coverdale, A. E. Turnell (Associates), C. B. Flockton, C. M. E. Hadfield, and C. F. Innocent. Mr. D. B. Jenkinson was awarded the Society's prize for the best set of measured drawings and sketches submitted; and Mr. J. Miller the President's prize for the best essay on an architectural subject. Messrs. J. M. Jenkinson, G. R. Bower, and J. R. Truelove were also awarded prizes for work in the Class of Design.

NEW PREMISES, HAMPSTEAD-ROAD.—Messrs. Oetzmann and Co. have added to their premises in Hampstead-road two large new showrooms, specially devoted to bedsteads, bedding, and bedroom furniture.

THE SURVEYORS' INSTITUTION.—Our report of the meeting of the Surveyors' Institution on Monday, when Mr. Thomas Blashill read an interesting paper on "London Streets and Street Traffic," is unavoidably held over until next week.

ENGINEERING SOCIETIES.

CRYSTAL PALACE ENGINEERING SCHOOL.—The "Wilson" Premium for the best paper read before the Crystal Palace Engineering Society during the present session has been awarded by the council to J. M. S. Culbertson for his paper on "Concrete." Other papers read during the session were "Engineering in India," by H. O'Brien; "Lighting of Railway Carriages," by A. C. Maclean; "Modern Locomotive Practice," by C. H. Delgado. The premium was presented to Mr. Culbertson by Sir William Henry White, K.C.B., D.Sc., LL.D., F.R.S., President of the Institution of Civil Engineers, Past President of the Institution of Mechanical Engineers, late Director of Naval Construction, on the occasion of the ninety-fourth distribution of certificates at the School on the 14th inst.

THE LONDON BUILDING ACT.

THE Lambeth Borough Council, on Thursday of last week (April 14), considered a letter from the London County Council, stating they were considering the amendment of the London Building Act, and asking for suggestions.

Mr. Henry C. J. Edwards, C.E., the Borough Engineer, presented a long report on the subject, after the consideration of which the General Purposes Committee passed the following recommendations:—

(1) That all questions of frontage line should be taken out of the hands of the District Surveyor, and decided by the London County Council, after consultation with the Borough Council.

(2) That applications for the formation of new streets and the definition of the building lines thereon should be dealt with by the London County Council, after consultation with the Borough Council.

(3) That, for the purposes of section 13 of the Act, the word "building" should be more clearly defined.

(4) That the term "temporary structure" should be more clearly defined, and that the licensing of temporary structures should be in the hands of the Borough Council.

(5) That plans of proposed new buildings should be submitted to, and deposited with, the Borough Council in the way that other plans are submitted, for an expression of opinion by the Borough Council.

These recommendations were adopted without amendment.

METROPOLITAN ASYLUMS BOARD.

A MEETING of the Managers of the Metropolitan Asylums District was held at the offices on the Embankment on Saturday last week, Sir R. Hensley, presiding.

Belmont Asylum.—Plans, prepared by Messrs. T. Dinwiddy and Sons, architects, for adapting certain of the buildings at the Belmont Asylum for the accommodation of unimprovable male imbeciles were approved. The section of the buildings to be adapted has previously been known as the infants' school. The architects' approximate estimate of the probable cost of carrying out the work in accordance with the plans is 14,000*l.*, of which 10,500*l.* represents the cost of adapting the buildings (including the necessary renewal of the sanitary fittings, repairing the roofs, etc.), and 3,500*l.* the cost of the new drainage system and its connexions.

Asylum Fire Precaution.—The Asylums Committee reported that for many years past iron bridges between patients' blocks had existed at Caterham Asylum, while they had also been provided at the newest asylum of the Managers at Tooting Bec. Those bridges served the double purpose (1) of ambulatories for the patients, and (2) of means of escape in case of fire. Having regard to the class of patients at Leavesden Asylum, the majority of whom were of the infirmary type, they had come to the conclusion, after due consideration, that it was expedient to provide four bridges of two tiers each between those blocks which were allocated to the more feeble and helpless patients. The Engineer-in-Chief had been consulted, and he estimated the cost at 3,000*l.*, if bridges similar to those at Caterham Asylum were provided, and at 5,000*l.* if the bridges were similar to those at Tooting Bec Asylum. They were of opinion that the proposed bridges should be in accordance with the Tooting Bec pattern, and that the flooring should be of concrete, with asphalte laid over. As regards the width, they thought that 7 ft. instead of 9 ft., would be quite sufficient. The reduction in width should effect the substantial reduction of 5,000*l.* in the estimate. They recommended accordingly.

This was agreed to.

Tooting Bec Asylum.—For some months past the Asylums Committee have had before them the question as to the need for the provision of additional accommodation for the infirmary type of patients placed under the Managers' care. Besides the proposal which the Managers recently adopted to convert two ordinary blocks at Caterham and Leavesden Asylums into infirmaries, they have become convinced of the necessity of providing still more infirmary accommodation if the Guardians' applications for the admission of patients are to be fully and promptly met. In a report on the subject, the Committee stated that the new asylum at Tooting Bec—which, it was anticipated, would meet for a long time all needs—had been kept constantly full, and latterly there had been several accumulations of outstanding applications for admission of patients, owing, first, to the difficulty of finding patients at Tooting Bec who were fit subjects to be placed in ordinary wards at the outlying asylums, and, secondly, to the fact that those asylums were practically full. The Tooting Bec Asylum scheme provided for the ultimate erection of two extra pavilions, which the Committee thought should now be erected. They recommended, and it was resolved, "That the proposal to erect at Tooting Bec Asylum (i) two additional infirmary blocks, (ii) two supplementary staff buildings, and (iii) a hall to accommodate not fewer than 300 patients, be assented to, and that the matter be referred to the Works Committee to deal with." The cost of the two blocks is likely to be about 26,250*l.*

COURT OF COMMON COUNCIL.

THE Lord Mayor presided on Thursday last week at the Guildhall over a meeting of the Court of Common Council.

It was agreed to refer to the Streets Committee the desirability of lowering the level of Botolph-alley to that of Botolph-lane, and to report.

The Library Committee reported on a letter from Sir Horace Plunkett, Vice-President of the Board of Technical Instruction in Ireland, on the subject of exhibiting in the Guildhall Art Gallery for a brief period a collection of works representative of Irish art. The Committee reported that the proposed arrangements were quite satisfactory, and they recommended that the matter be referred back to them to make the necessary arrangements. Mr. J. H. Lile moved the previous question in order to raise the question of the Sunday opening of the picture exhibition, but his resolution was defeated, and the report was carried.

COMPETITIONS.

BATHS, SELLY OAK.—Thirty-four sets of designs were received by the King's Norton and Northfield Urban District Council for the proposed new Public Baths, the estimated cost of which was not to exceed 9,000*l.* The assessor selected three designs, which he placed in the following order of merit:—First (No. 16), by Mr. E. Harding Payne, of London; second (No. 1), by Mr. H. Dighton Pearsor, of London; third (No. 20), by Messrs. North and Robin, of London.

PUBLIC BUILDING, TIPTON.—On the 14th inst. a special meeting of Tipton District Council was held in reference to the scheme for the erection of a free public library and town hall, on a site contiguous to the Victoria Park. The report of a sub-committee stated that there were thirteen competitive designs, and they had awarded the premiums as follows:—First, 50*l.*, Mr. E. G. Coslett, Dudley; second, 20*l.*, Mr. E. H. Wenyon, Great Bridge; third, 10*l.*, Mr. A. G. Lathom, Birmingham. Ultimately the report was adopted by the casting vote of the chairman.

WAKEFIELD LIBRARY.—The names of the successful competitors in the competition for the proposed free library buildings at Wakefield are:—First premium, 80*l.*, Messrs. Alfred Cox, H. C. Trimnell, and W. Rupert Davison, the Adelphi, Strand, London; second, 60*l.*, Messrs. Hector and Thornton, 86, York-street, Westminster, S.W.; third, 40*l.*, Mr. Arnold Mitchell, 39, Great Marlborough-street, London, W. The following extracts from the report of the Advisory Architect, Mr. Maurice B. Adams, refer to the designs which have been chosen by the Council. There were eighty-one designs, but one was excluded for an infringement of the conditions, through the author's name being divulged. Of the eighty the following dozen were placed for the final choice, viz., Nos. 3, 5, 12, 17, 20, 30, 34, 36, 48, 55, 60, and 66. The Advisory Architect, in his report, says,

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"The instructions issued to the competitors were sufficiently precise, the problem set amounting to the provision of the best library building for the particular site, and suitable for the City of Wakefield in so far as the provisional sum of 8,000*l.* will allow, including clerk of works salary and the architect's usual fees. Two further stipulations occur as to minor matters of detail, in the answer furnished to competition questions, viz., cloak-room accommodation for two sexes, for the staff, and conveniences for the public. Broadly speaking, therefore, the essentials of the scheme are comprised in securing the largest and most conveniently arranged public rooms, capable of easy and complete supervision, in a well-designed and appropriate building, for the purpose intended." The following references occur in the report:—"No. 17 (by Messrs. Hector and Thornton), although I do not place this design first in merit, must receive prior consideration, because it is the only reasonably appropriate scheme which can be really executed for the money, though it cannot be said that as a library this plan takes precedence as a model arrangement. It is, however, very compact, the chief defect in the contrivance being that the supervision of the newspaper and magazine room has to be conducted from the end of the lending library across the entrance hall with people coming and going, as well as the borrowers waiting at the counter, and indications necessarily intervening between the library officials and the readers whom they would have to supervise. The character of the building, designed as it is in a rather common-place type of the Georgian style, is distinguished by comparative boldness which hardly insures any special degree of architectural interest. Nevertheless, I am disposed to think that perhaps the elevations would look fairly well, and certainly they would be much improved if the work were well detailed in a bold and handsome scale. No price is quoted per foot cube to show how the estimate of 7,300*l.* for the fabric is arrived at. I calculate the contents at considerably more than the 146—146 cubic feet given by the architect in his report—but at the same time the money he has allocated for the building would appear to be sufficient to carry the work out properly. The reading-room is much the smallest of any of the plans mentioned in this report. . . . Ample light is provided, and doubtless these would make good useful rooms. If anything, they are too lofty. In the absence of a section it is not easy to be exact. . . . The counter for borrowers is not ample enough. The hall and borrowers' space is economically arranged. The box for the attendant at the end of the reading-room ought to be removed, and instead of the two doorways a large supervision window should be inserted, with one wide double swing doorway placed beside it towards the centre of the building. . . . The ladies and children's room is not well placed for supervision, and the author's remark as to the need of privacy in this department is at variance with my experience. The room for the librarian is too spacious, as the committee would not meet here, but in the Town Hall close by. On the other hand, the staff accommodation is small and indifferently provided, the girls being without a cloak-room. The mending-room in the basement is inconvenient, with an awkward approach. The public conveniences are very cramped, and would be better omitted entirely. The back entrance is a good feature, and the caretaker's rooms are not badly arranged. The other designs herein referred to are all more extensive than the available money will pay for, but they are less in this respect than many which I have been compelled, for this reason, to leave out of consideration; while the few remaining cheaper plans presented radical defects in other ways, which left me no alternative but to pass them by and to select . . . some of the more suitable . . . and least expensive ones. Foremost among them is No. 66 (by Mr. Arnold Mitchell, F.R.I.B.A.). The author's figures of 192,430 ft. cube are short of what they should be, but his price reckoned at 10d. per foot, leaves nothing for the architect and clerk of the works. I am, however, of the opinion that this plan, as a basis for a reconsideration, is not surpassed by any of the plans submitted. It embodies a direct, roomy, and square method in the main contrivance of the buildings, which renders the making of a good library quite possible without altering the leading essentials of its arrangement. These appear to me as worthy of the occasion, in spite of some serious defects in matters of detail, such as the cramped head-room to the staircase of the rear premises. Externally the design is dignified and free from over elaboration, broad in its proportions, and well adapted to the local brickwork without too liberal a use of wrought masonry. The height of the intermediate parts of the elevations is too low, and would have to be increased. The main entrance also needs modifications. The chief fault against the plan is that it covers so large an area, and the rooms are too big, particularly the reference-room (over 2,000 ft. super.), where space is lost in a way easily avoided by a more compact redrawing without departing from the principle already mentioned or embodied in this plan. The cloak-rooms asked for the staff are not provided, and I do not think the author has made the most of the different levels of the two streets, front and rear." Of No. 60 (the design by Messrs. Cox, Trimnell, and Davison, chosen by the City Council) Mr. Adams says:—"A considerable area of the site is covered by this plan, which, however, is a good one, and the heights are wisely kept low generally to moderate the cube contents. They exceed the cube of No. 66, and the total amount of cube given by the author, 208,106, does not come up to my estimate of them. His price of 8½d. per foot is too low, consequently his calculations of 7,370*l.* for the fabric is not reliable. The exterior of this design is treated in a picturesque, inexpensive, and somewhat pleasant way. Its effect would be greatly improved by a more decided projection where the entrance occurs. The perspective indicates something of the sort, as the draughtsman, with this end, has taken some little liberty with the plan of the columns of the portal. The interior views are misleading in respect to the extent of the building. The arched nave-like centre to the lending library makes a capital feature as seen from the entrance hall, though it increases the cost materially. The male and female staff cloak-rooms are convenient. The goods entrance and lift are nicely managed, and the staircase is well lit. The caretaker's house is a good one. The lending library is 62 ft. by 27 ft. Two rooms, one for newspapers and one for magazines, are provided, each 46 ft. by 25 ft., giving somewhat less reading space than No. 66. The reference-room and the room for ladies and children are both 30 ft. by 25 ft. The books in the reference-room range round the walls, furnishing not too ample a provision. The caretaker's yard is very much in evidence from the main thoroughfare at the north end of the site. The store-room over the entrance hall gives a reason for the central external feature of the façade, but in itself it is not a great advantage, with its double circular stairways, and it might be omitted. The enclosing railing-fence to the land is neat, and looks suitable, as seen in the view. This design certainly runs No. 66 very closely in many respects, and could be moderated in size without changing its main essentials of arrangement. Cost would make such reduction inevitable. From the point of view of library management this scheme has much to recommend it to your consideration." "Designs marked 5, 12, and 3, were placed among the six selected for the ultimate award, Nos. 30, 20, and 34 being also favourably alluded to, as well as proposals Nos. 36, 48, and 55, all of which are good designs, marked by merit, but they are either too large or too expensive. The whole of the drawings will be on public exhibition in Wakefield."

HALIFAX SOLDIERS' MEMORIAL.—A meeting of the Halifax Soldiers' Memorial Committee was held at the Town Hall, Halifax, on the 19th inst., for the purpose of receiving the report of the Designs Sub-committee on the designs and models sent in in competition. It was reported that the number of designs submitted in connexion with the first local competition was thirty-four, and in the subsequent open competition fifty, including all the local ones, except eight which had been returned at the request of the authors. The Sub-committee's recommendation was that three designs, marked respectively "Prom," "Excelsis No. 1," and "Peace," be considered by the General Committee. After various expressions of opinion it was decided, on the motion of Mr. Joseph Whitaker, that the design marked "Prom" be adopted, with the substitution of the figure of one soldier on the top of the monument in place of the four shown in the drawing and model. For the second and third places two designs, marked respectively "Non sibi sed patriæ" and "Excelsis No. 1," were selected. With regard to the appointment of an assessor, it was suggested that the matter should be left to the Sub-committee, the assessor's duties to be to decide whether or not the selected designs can be carried out for the money stated. Colonel Gray said he thought the original intention had been that the assessor should assist the Committee in coming to a decision. Another member of the Committee wanted to know why, having made the selection, they could not do without an assessor, and it was explained that it had been advertised that an assessor would be appointed. A motion was made that Mr. Williams, a local architect, should be appointed assessor, but it was pointed out that there might be objections to such a course. Eventually it was resolved that the sub-committee should appoint some outside gentleman to act as assessor, and that the Committee meet to do this as soon as possible.

Illustrations.

NEW BUILDING FOR THE INCORPORATED LAW SOCIETY, CHANCERY LANE.

Externally.—The new building has been designed to harmonise as far as possible with the old work, the common-room windows being strongly emphasised on both the Chancery-lane and Carey-street fronts. The walls are faced with Portland stone and the roof is covered with thick green Westmoreland slates. The four figures, representing Truth, Justice, Liberty, and Mercy were carved by Mr. C. Pilsworth.

Internally.—The staircase is lined entirely with Portland stone, the steps being of Hopton Wood stone. The luncheon-room has been panelled to a height of nine feet with Austrian wainscot oak, the frieze above being plaster and the floor of oak wax-polished. The smoking-room adjoining the luncheon-room is treated in a similar manner, the frieze being decorated with paintings by Mrs. Gray-Hill. The members' common-room is lined to a height of fifteen feet with Honduras mahogany, French polished, and finished a dark rich colour. Parts of the woodwork, especially the chimney pieces and around the large windows, are elaborately carved by Mr. Aumonier. Bookcases are arranged round a considerable part of the room. The large columns and pilasters are in Greek Cippolino marble and have bronze bases and capitals cast by Messrs. Singer, of Frome. The frieze is the work of Mr. Conrad Dressler, and the floor is of teak, wax-polished. The decorated glass was designed and made by Mr. B. Nelson, and represents the arms of the various Inns of Court, the centre of the Chancery-lane window bearing the arms of the Law Society.

The frieze in the new hall, referred to above, is composed of a series of thirteen panels joined by festoons of leaves and fruit. They are all original models, by Mr. Conrad Dressler, fired in clay, and enamelled in various colours. The festoons are in the old Italian style of Faenza. The subjects are in Persian enamels, these having a quality of depth which no others attain to.

The subject of the whole series is Justice. It is treated in two large panels and shown in the aspects of "Human" and "Divine Justice." "Human Justice," over the chimney at the Chancery-lane end, is represented by a female figure holding the scales, while a warrior seated opposite leans on the sword of Justice. To the right is a seated figure of a student engaged on the records of the Law. Behind the chair of Justice is the figure of the Lawgiver, in deep thought. At her feet crouches that of the gaoler holding the prison keys. Behind him is the prisoner gnashing his teeth. The retreating figure on the right is that of a disappointed suitor. A coin, with the effigy of Cæsar, the trumpet proclaiming the law, the hour glass, etc., all decorate this human aspect of Justice.

On either side of this panel and all round this part of the hall, are eight smaller figures representing in sequence: Judgment, poised on one foot with a plumb-line in her hand; Truth, with a mirror which she turns so as to see the reflection of the world; Integrity, who refuses a proferred money-bag; Prudence, an angel, with outstretched palms, fearing to tread

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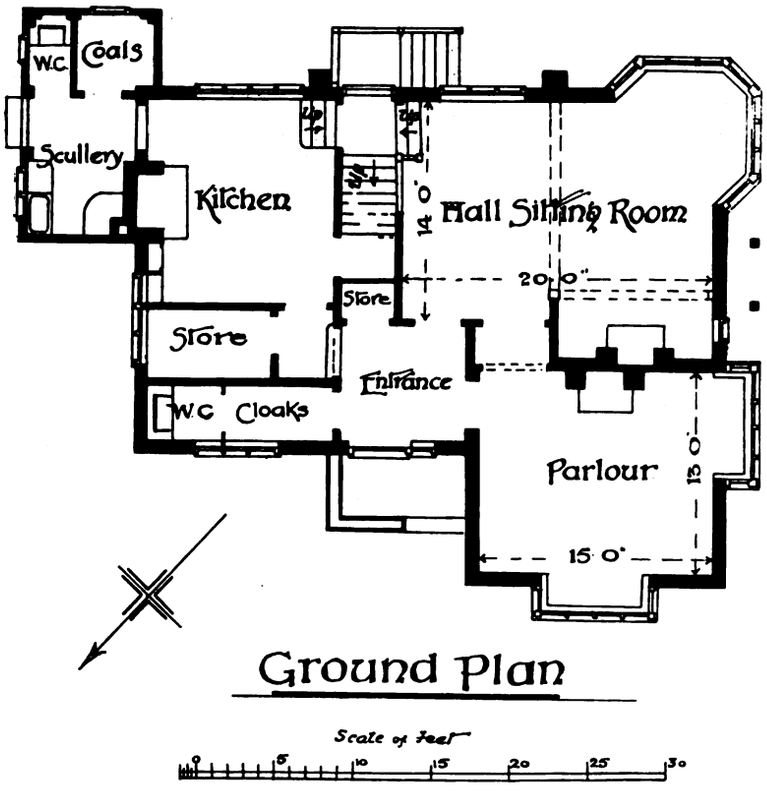


Bungalow at Chorley Wood.

where fools would rush in; Strength, with the column, lion's skin, and club, emblems of strength; Wisdom, holding a serpent curled round her right arm—she holds her left hand to her ear, and bends to listen to its voice; Freedom marches wrapt in the folds of a fluttering banner, the cap of liberty in her hand; Knowledge stands calmly looking before her, pen and book in hand, and at her feet instruments of knowledge.

The other large panel, at the Carey-street end, represents Divine Justice; Mercy exemplified by the old story of the Good Samaritan. He stands on a bank, on which he has unloaded his asses' panniers. The three smaller panels at this end of the hall represent the three cardinal virtues: Hope, leaning on the anchor; Faith, bearing the cross and chalice; and Charity, carrying little children.

Eight small medallions represent the arms of various inns connected with the hall.

The consulting engineers for the work were Messrs. Dolby and Williamson. The general contractors for the work were Messrs. Colls and Sons (Colls and Trollope); the sanitary work has been done by Messrs. Dent and Hellyer; the kitchen filling by Messrs. Slater; the lifts by Messrs. Easton and Co.; the heating by Messrs. Berry and Sons; and the electric lighting by Messrs. Hankinson and Co. Mr. H. Percy Adams is the architect.

The above particulars were furnished to us by the architect and by Mr. Dressler. We may add one or two comments of our own. In saying that the new building "has been designed to harmonise as much as possible with the old work," Mr. Adams does not do justice to his own work, which, while it does harmonise with the old work in so far as it is of classic type, displays a very remarkable originality and novelty of treatment and of detail, and is in fact classic material used in a new manner.

In the interior, the Greek Cippolino marble for the pilasters, which was, we believe, selected on the advice of Mr. Dressler, has, with its rather irregular vertical striation of white and grey, a very good decorative effect, and the slightly wavy lines of the marble prevent the pilasters from having the hard effect which polished marble pilasters sometimes have in an interior. The fireplace openings are very effectively framed in two marbles—dark and light. To our thinking, the festoons of the frieze are a little too strong against the light surface of the wall, and catch the eye too insistently; but this is the only criticism we have to make. As a whole, it is a remarkable piece of architectural and decorative work, and does the highest credit to the architect, and to the sculptors who worked with him.

BUNGALOW, CHORLEY WOOD.

THIS small house has been built as a summer cottage residence for two ladies. The site, of about 1 acre, is situated about a mile from Chorley Wood station, and commands extensive views of the surrounding country.

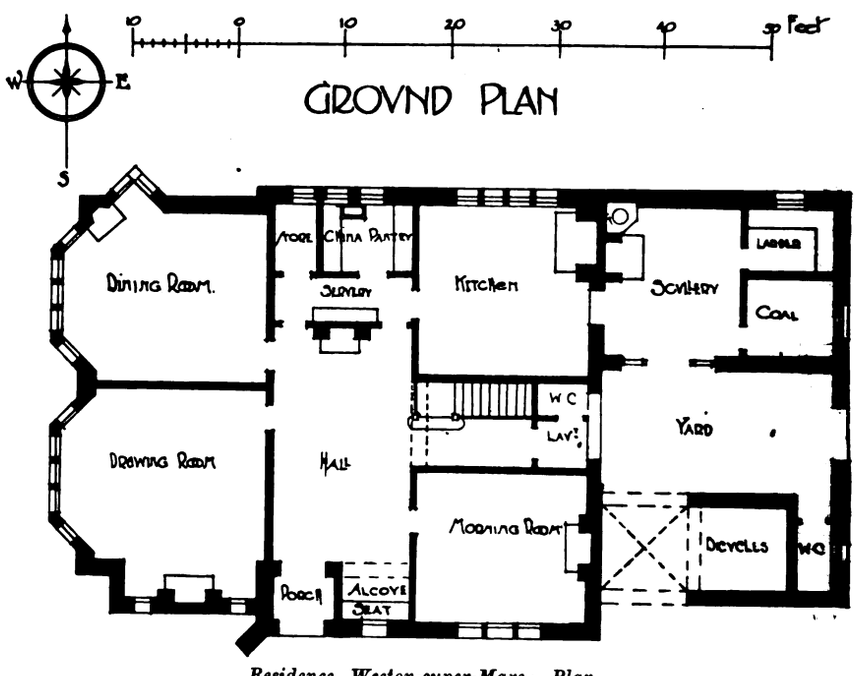
The house is treated externally with a cream-tinted rough cast, and the roofs are covered with Burgess Hill sand-faced, red tiles; the timber work in the gables being of oak; all internal joinery is polished. The first floor contains four bedrooms and a bathroom.

The cost was about 950*l.*, and the builder, Mr. W. Judge of Watford. The architect is Mr. Arthur O. Breeds.

RESIDENCE FOR WESTON-SUPER-MARE.

THIS house, though designed for a site at Weston-super-Mare, was not actually carried out. The materials to be used were the local grey limestone for the lower part, the upper part to be tile hung, and with smooth plaster gables, and roof covered with hand-made tiles.

Mr. H. Dare Bryan, of Bristol, is the architect.



Residence, Weston-super-Mare. Plan.

Correspondence.

REGISTRATION OF ARCHITECTS.

SIR,—I should be much obliged if you would kindly afford me the opportunity of stating in your columns, that the circular issued by "The London Committee of Members of the R.I.B.A. for promoting the Statutory Qualification of Architects," polling members of the R.I.B.A. on the question of registration and bearing my name, was issued without my knowledge or consent; and that in consequence of this action on their part, of which I entirely disapprove, I have ceased to be a member of that Committee. EDMUND WIMPERIS.

ORPINGTON CHURCH.

SIR,—In connexion with your article on Orpington Church, it may be of interest to some of your readers to know that among the drawings relating to the restoration commenced in 1872 by the late Ewan Christian are two photographs, taken from old engravings, which show the tower at two different periods before it assumed its present form. The earlier one shows the tower carried up to a height of apparently about 30 ft. above the top of the buttresses of the existing vaulted lower stage. It is finished with a small octagon spire set well within an embattled parapet. The belfry is lighted by two small windows on each face, probably lancets (though drawn, in common with the lancet still existing in the lowest stage, with round heads). A larger window with pointed arch is shown lighting the ringers' chamber. The whole of this upper portion appears to have been in ruinous condition, as there are indications of fractures and iron ties. Mr. Christian's scheme of restoration included the rebuilding of the modern part of the tower, and a design was prepared, based on the suggestions of this view.

The latter engraving shows the wooden structure referred to in the article. It consists of a square bell-chamber, set in some distance from the face of the walls below and connected with them by hipped slopes. It is surmounted by a steep spire, the upper part of which is canted off to an octagon, and finished with a ball and vane. The whole of this erection appears to have been weather-boarded.

The earlier view shows apparently the old vestry which preceded the modern one. It seems to have been of about the same extent as the present one, but had an angle buttress at the north-east corner, a narrow square-headed window on the north side, and was covered by a steep hipped roof.

The writer of the article is mistaken in stating that the circular window in the west gable was inserted in 1873. It had been put in at some time before 1870, at which date the preliminary survey for the restoration was made. J. STANDEN ADKINS.

BARNET ISOLATION HOSPITAL COMPETITION.

SIR,—At the last meeting of the Barnet Isolation Hospital Committee it was stated

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that several architects had written declining to compete on account of there being no assessor. A member suggested that the matter should be reconsidered, but without any satisfactory result.

I would suggest that those architects who still intend to compete should procure both reports of this meeting. These will be found in *The Barnet Times* of April 15, and *The Barnet Press* of April 16, both of which are penny papers. The reports are interesting, as they contain a long discussion on the question of inadequate accommodation.

E. P. HOWARD.

[*** It appears that the Committee have received letters from two architects declining to compete on account of no assessor being appointed, but the Committee apparently remain obstinate in their determination *not* to employ an assessor. If the other intending competitors will follow the lead of these two (and we think they owe it as a duty to the profession to do so), the Committee will be compelled to give way.—ED.]

The Student's Column.

ARCHES.—XVI.

AN advantage presented by Alexander and Thomson's method is to be found in the fact that any uniform load over the entire span of an arch can be added without change of the described circle which forms the boundary of the kernel, or middle third, of the arch ring, always presuming the load so added is not such as to make $y_0 \div \rho_0$ greater than one-third. The only effect of the added load is to reduce the angle θ_1 as well as the quantity δ_0, and the equilibrium polygon is still left within the kernel originally designed. It will readily be recognised that this feature possesses considerable advantage in connexion with moving loads.

The depth of the keystone is not governed simply by the conditions of equilibrium, but also by the strength of the material, and the depth, it will be noticed, is a function of y_0 and δ_0. Thus the design of the keystone varies in accordance with the requirements of specified conditions.

Another advantage possessed by this tabular method is that for stated conditions an arch of definite form and size can be directly designed without the usual tentative methods of trial.

As the moving load on a masonry arch is usually small compared with the dead load, it is not necessary to consider unsymmetrical loading. In the case of a moving load covering only one-half of the span, the equilibrium curve at the crown will be raised somewhat, thus leaving a small distance between it and the dead load equilibrium curve. The effect of this alteration is to establish a couple tending to rotate the key, but such tendency can be neutralised in the manner subsequently explained in Example VI.

For the purpose of rendering the foregoing discussion of practical use to our readers, we append some examples illustrating Alexander and Thomson's method for designing masonry arches. Fig. 67 is taken from the drawing of an arch designed by this method and engraved on a grand scale by the Royal Irish Academy.*

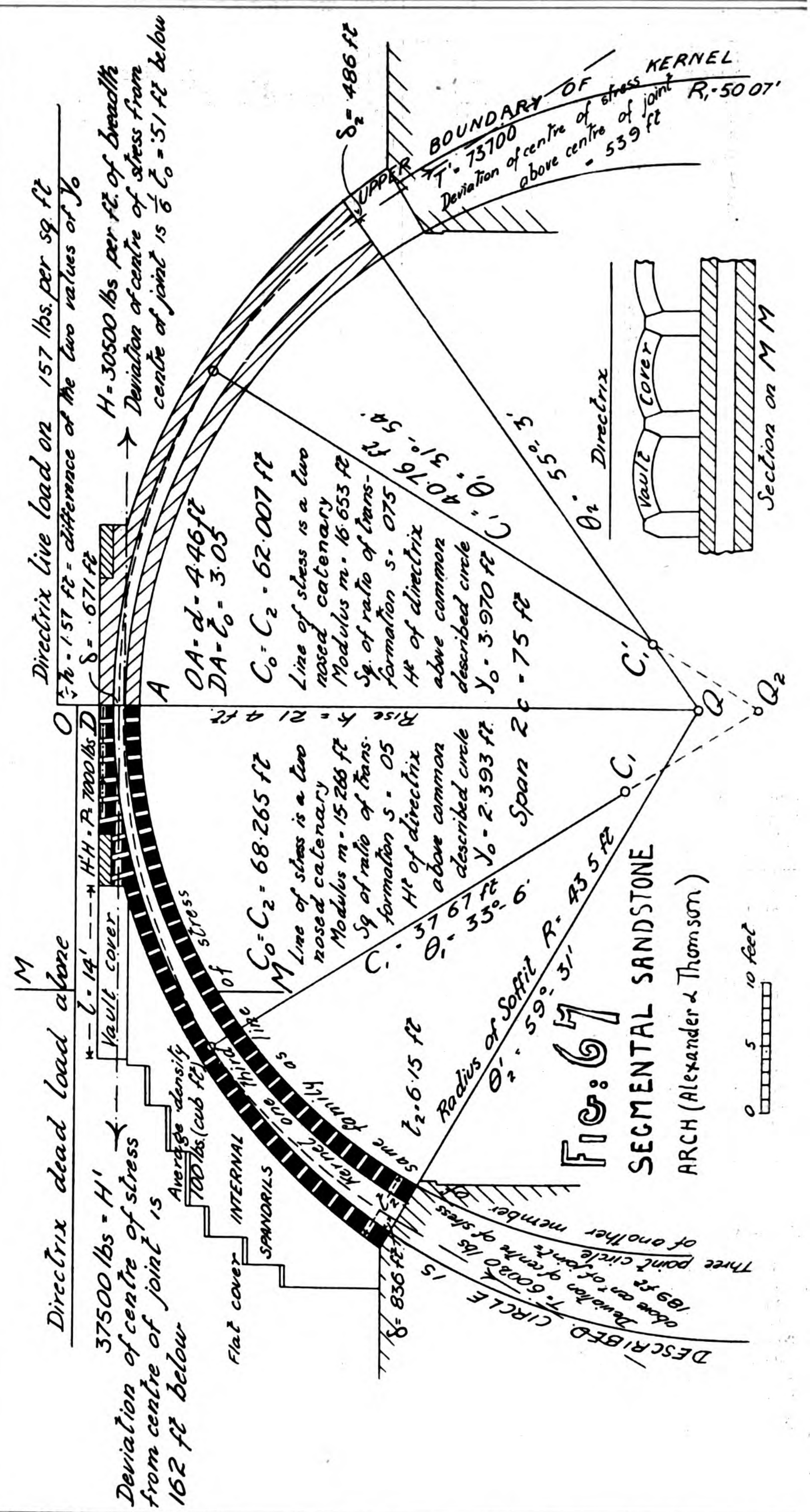
Example I.—This shows how a sandstone segmental arch with vertical load can be directly designed from Tables IV., V., and VI., which in this and the following examples are referred to as Tables A, B, and B_1 respectively. Span of arch 75 ft. and depth of surcharge at crown about 1 ft. 4 in. The springing to be the joint of rupture. (See left half of Fig. 67.)

Here $2c = 75$, and $d - t_0 = 1{\cdot}3$; their ratio being 56·25. We find by trials on Table B_1 that $2c \div (d - t_0) = 53$, occurs on the line where $s = 0{\cdot}05$, and the multiplier required on that line to make $2c$ into 75 is 50·07, about half the maximum multiplier given under "Sandstone" in the table; so, as the table is calculated for a factor of safety of 10, we shall have a factor of safety of about twice ten.

From the line designated by $s = 0{\cdot}05$ in Table B_1 we obtain the relative values given in line (1) below, and multiplying these by 50·07, we find the absolute values that are stated in line (2):—

$s = \cdot 05$		d	t_0	t_2	R	k	$2c$	
	relative	0·089	0·061	0·123	0·869	0·427	1·498	(1)
	absolute	4·46	3·05	6·15	43·5	21·4	75 ft.	(2)

* "Transactions of the Royal Irish Academy." Vol. xxix., Part III.



The radius and rise of soffit are 43·5 ft. and 21·4 ft.; the thickness of arch ring at the crown and springing are 3 ft. and 6 ft. 2 in.; the surcharge being 1·41 ft., or about 1 ft. 4 in., as required.

On the same line of Table B_1, continued on Table B, we obtain the relative values in line (1) below, and find the absolute values in line (2), by use of the multiplier 50·07, as before:—

$s = 0{\cdot}05$		R	ρ_0	Y_0	δ_0	δ_2	
	relative	1·00	1·3634	0·0478	0·0204	0·0167	(1)
	absolute	50·07	68·265	2·393	1·02	0·836 ft.	(2)

At the crown the thrust on the arch ring per foot of breadth is $H = w\,\rho_0\,d = 140 \times 68{\cdot}265 \times 4{\cdot}46 = 42{,}624$ lb.; the average intensity is $42{,}624 \div 3{\cdot}05 = 13{,}975$, and double this is the maximum intensity $= 27{,}950$ lb. per sq. ft., giving a factor of safety of $576{,}000 \div 27{,}950 = 20$. In other words, the multiplier being about half that stated in the table, the factor of safety is twice ten.

At the springing $T = H \sec. \theta_2 = 84{,}023$; the average intensity $84{,}023 \div 6{\cdot}15 = 13{,}662$; and, since the deviation of the centre of stress is $\frac{1}{6} t_2 - \delta_2 = 1{\cdot}025 - 0{\cdot}836 = 0{\cdot}189$ above the centre of the joint, we can substitute this for δ, the deviation of the centre of stress from the middle of the joint. Then:—

$$\frac{\textit{Maximum stress}}{\textit{Average stress}} = 1 + \frac{6\delta}{t_2} = 1{\cdot}184.$$

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Hence the maximum intensity of the stress on the springing joint is 16,180 lb. per sq. ft. Dividing this out of 576,000 lb., which is the crushing strength of sandstone, we get the factor of safety 35.

Example II.—If a live load of 220 lb. per sq. ft. of the platform be placed all over the span of the bridge taken for Example I., find the new line of stress in the arch ring, and the intensities of the stresses at the crown and the springing. (See right half of Fig. 67.)

The height of superstructure in sandstone equivalent to this live load is :—

$$h = 220 \div 140 = 1{\cdot}571 \text{ ft.}$$

Here we have to find a new two-nosed catenary, still inscribed in the same circle $R_1 = 50{\cdot}07$, forming the upper boundary of the middle third of the arch ring, as already designed in Example I., but to a directrix h, higher than before. Adding h to the old value Y_0 we get $2{\cdot}393 + 1{\cdot}571 = 3{\cdot}964$, which, divided by $R_1 = 50{\cdot}07$, gives us 0·0793 as a new relative value of Y_0, which is found in Table B at the line $s = 0{\cdot}075$.

Thus we get the following values :—

s	θ_2		R	ρ_0	Y_0	δ_0	δ_2
0·075	55° 3′	*relative*	1·00	1·2384	0·0793	0·0134	0·0097
		absolute	50·07	62·007	3·970	0·671	0·486 ft.

This is a new two-nosed catenary, of a different modulus and of a different family, so that the soffit already designed will not be mathematically the three-point circle of another member of the family of this line of stress, but it will sensibly be so. The joints of rupture have gone up to 55 deg. 3 min.; but this is immaterial, as the line of stress is now closer to the upper boundary of the kernel, and will therefore be wholly in the kernel down to 59 deg. 31 min., the springing joint. In designing the abutment, the tangent at the joint 53 deg. 3 min. should lie in its middle third.

At the crown now we have the thrust $H' = w\,\rho_0\,(d + h) = 140 \times 62{\cdot}007\,(4{\cdot}46 + 1{\cdot}57) = 52{,}346$ lb. The average intensity is 52,346 ÷ 3·05 = 17,162; the deviation of centre of stress is $\frac{1}{2}\,t_0 - \delta_0 = 0{\cdot}509 - 0{\cdot}671 = 0{\cdot}162$ ft. below the centre of the joint. The apparent factor of safety is 576,000 ÷ 17,162 = 33. As the fractional deviation of the centre of stress from the middle of the joint is 0·162 in 3·05 or 1 in 18 nearly, the factor of safety is three-fourths its apparent value. That is, the factor of safety at the crown is 27, when the live load is on the bridge.

At the springing joint $T' = H'$ sec. 59 deg. 31 min. = 103,188 lb., the average intensity is 103,188 ÷ 6·15 = 16,778; the deviation of the centre of stress is $\frac{1}{2}\,t_2 - \delta_2 = 1{\cdot}025 - 0{\cdot}486 = 0{\cdot}539$ ft. above the centre of the joint. The fractional deviation of the centre of stress is 0·539 in 6·15, or less than 1 in 10. The apparent factor of safety is 576,000 ÷ 16,778 = 34, and the actual factor of safety is not less than five-sixths of this, or 21.

Example III.—Let the live load, stated in Example II., cover but one-half of the span of the same arch. Find the horizontal thrust to be balanced by the backing of the voussoirs.

The horizontal thrust due to dead load alone, as in Example I., is H = 42,624 lb., and the horizontal thrust due to live and dead loads, as in Example II., is H = 52,346 lb., the difference being 9,722 lb. per ft. of breadth.

Example IV.—Suppose the arch ring, spandrels, etc., of Example I. have, by means of voids in the superstructure, an average density of 100 lb. per cubic ft. Find results corresponding to those of Example I.

For stability, and to give the required value of the surcharge, $d - t_2$, the dimensions in Example I. are required just as before, but the stresses will be altered in the ratio 140 : 100. H now becomes about 30,500 lb. and T = 60,320 lb., giving factors of safety of 28 at the crown and 49 at the springing. These values are shown in Fig. 67.

The voids in the superstructure should be so arranged that their boundary may be roughly a member of the same family as the line of stress, by making the ordinates of their boundary a constant fraction of those of the soffit.

Example V.—Let a live load of 157 lb. per sq. ft. of platform be over the whole span of the bridge (Example IV.). Find the line of stress and the intensities of the stress at crown and springing.

The equivalent height of structure is 1·57 ft., taking the new density into account, so that the solution is the same as Example II., only we must alter the quantities in the ratio 140 : 100.

H′ = 37,500 nearly, and T′ = 73,700 nearly, and the factors of safety are increased to 35 at the crown and 31 at the springing. These values are shown in Fig. 67.

Example VI.—Let the live load in Example V. be over only one-half the span. Find the amount of horizontal thrust to be balanced by the frictional stability of vault covers, butting against the higher voussoirs. Find, also, the distance back to which the vault covers must extend to balance it.

The thrust is $P = H' - H = 37{,}500 - 30{,}500 = 7{,}000$ lb., per ft. of breadth. If the underside of the vault covers comes up to the level of the crown of the soffit, then the weight per ft. of breadth of bridge on the spandrels due to the vault covers, and the dead load over them alone, is $w\,d\,l = 140 \times 4{\cdot}46\,l = 624\,l$. Taking the co-efficient of friction at 0·7, then $0{\cdot}7 \times 624\,l = 7{,}000$, or $l = 16$ ft., to the nearest foot. The voussoirs near the keystone should have square-dressed side joints until the sum of their vertical projection is t_0, the depth of keystone, so as to receive the horizontal longitudinal resistant thrust of the vault covers truly; and the covers should be built with square-dressed side joints set closely, so as to yield as little as possible. Light spandrel walls may be built up to the level of the crown of the soffit and extend back for a distance equivalent to 16 ft. longitudinally of vault covers; then the spandrels may step rapidly down to lower levels.

Example VII.—If the bridge (left-half of Fig. 67) is to carry a road approaching with a slope 1 in 100, and passing over with a curved profile sensibly circular, find the position of profile.

To make the profile sensibly a member of the same family as the line of stress, it is sufficient to derive it from the soffit, which is sensibly a member of the family. Let u_0 and u_2 be the depths to profile at crown and springing. The tangent to profile, being like that to a parabola, gives slope of half chord of profile 1 in 200; hence $u_2 - u_0 : 37{\cdot}5 :: 1 : 200$, and $u_2 : u_0 :: 4{\cdot}6 + 21{\cdot}4 : 4{\cdot}46$. Hence $u_0 = 0{\cdot}04$ ft. and $u_2 = 0{\cdot}23$ ft. The profile is to be below the directrix about ½ in. at crown and about 3 in. at springing. The load left out between directrix and profile increases the factors of safety as 4·46 (4·46 − 0·04).

Example VIII.—This example relates to the design of a semi-circular arch ring of common sandstone, the span to be 100 ft., and a surcharge of at least 1½ ft. being required for the formation of the roadway, the laying of gas-pipes, etc. The data are R = 50, and $R \div (d - t_0)$ not to be less than 33. On Table B, the lines above that commencing with $s = 0{\cdot}08$ (in order to make R into 50) require a multiplier greater than the maximum given for sandstone. These lines are, therefore, excluded on the question of strength, while the lines below that commencing with $s = 0{\cdot}05$ give $R \div (d - t_0)$ greater than 33, and are excluded by the requirements of the roadway. Those two limiting lines give :—

s	*Mult.*	R	d	t_0	θ_2	*Factor of Safety.*
0·08	53·6	50	5·9	2	54° 14′	$\frac{57 \times 10}{53{\cdot}6} = 10{\cdot}6$
0·05	57·5	50	5·1	3·5	59° 31′	$\frac{104 \times 10}{57{\cdot}5} = 18$

The upper gives greatest economy of material in the arch ring, which is only 2 ft. at the crown, but less economy of material in the superstructure, as d is larger; and also less economy of solid backing, which has to be built to a joint 5 deg. higher. Hence the line midway between them would be most suitable for round. For a single arch a line a little nearer the upper one may be adopted; and for a series of arches a line nearer the lower one, that is, in favour of a heavier arch ring to withstand the shocks transmitted from arch to arch. The best lines, then, are as stated below (1) for a single arch and (2) for a series of arches :—

	s	*Mult.*	R	d	t_0	t_2	θ_2	*Factor of Safety.*
(1)	0·07	54·526	50	5·6	2·4	4·4	55° 53′	$\frac{69 \times 10}{54{\cdot}5} = 12{\cdot}7$
(2)	0·06	55·804	50	5·3	2·9	5·4	57° 38′	$\frac{85 \times 10}{55{\cdot}8} = 15{\cdot}2$

Compare Rankine's empirical rule, "Civil Engineering," Article 290, giving :—

$$t_0 = \sqrt{\cdot 12 \times 50} \text{ and } \sqrt{\cdot 17 \times 50}$$
$$= 2{\cdot}45 \text{ and } 2{\cdot}92 \text{ respectively.}$$

The solid backing must be brought up to the point where the joint at θ_2 meets the back of the arch ring, and below that joint the arch ring may be of the uniform thickness t_2. The superstructure may readily be reduced by voids and the employment of material of less density than sandstone, till the average density of the whole is a fifth less than that of sandstone, which would raise the factors of safety at the crown to 16 and 19. The factors of safety at the joint of rupture are even greater, as the centre of stress is nearer the centre of the joint, and $t_2 \div t_1 >$ sec. θ_2. By means of the values obtained for w, ρ_0, d, δ_2, the thrust at the crown and the joint of rupture, and the centre of stress at the joint of rupture, are calculated, as in Example VI. A tangent from this last point enables a suitable abutment to be designed.

BOOKS RECEIVED.

WORKSHOP COSTS FOR ENGINEERS AND MANUFACTURERS. By Sinclair Pearn and Frank Pearn. (The Technical Publishing Co. 21s.)

RECENT IMPROVEMENTS IN METHODS FOR BACTERIAL TREATMENT OF SEWAGE. By W. J. Dibdin, F.I.C., F.C.S. (The Sanitary Publishing Co. 1s.)

A HANDBOOK OF SEWER AND DRAIN CASES. Revised and corrected by J. B. Reignier Conder. (The St. Bride's Press. 2s. 6d.)

GREAT MASTERS: Reproductions in Photogravure. Part XIII. (W. Heinemann. 5s.)

APPLICATION OF ELECTRIC-MOTORS TO MACHINE-DRIVING. By Andrew Stewart. (Rentell and Co.)

NOTES ON BLACKSMITH'S WORK. By Major R. F. Sorsbie, R.E. (W. and J. Mackay and Co., Chatham.)

THE MEANING OF A MODERN HOSPITAL. By R. W. Bruce Clarke, F.R.C.S. (Longmans, Green, and Co 1s.)

OLD WEST SURREY. By Gertrude Jekyll. (Longmans, Green, and Co. 13s.)

HAMPSHIRE. B. J. Charles Cox, LL.D., F.S.A. (Methuen and Co. 3s.)

ENGLISH ARCHITECTURE. By T. Dinham Atkinson, Architect. (Methuen and Co. 3s. 6d.)

ANTWERP: AN HISTORICAL SKETCH. By Wilfrid C. Robinson. (R. and T. Washbourne. 5s.)

SIX LECTURES ON PAINTING. By G. Clausen A.R.A. (Elliot Stock. 5s.)

THE STRENGTH OF CRUSHER-DUST MORTAR.—Some difference of opinion is entertained as to the advisability of employing dust from stone-crushers in place of sand for making mortar, and those who have not had facilities for testing mortar so made may naturally be somewhat doubtful as to its desirability. From the results of recent tests there appears to be no doubt that the medium in question is in every way suitable for use in mortar and concrete. The dust used in these tests was fine enough to pass a 100-mesh sieve, and in making the briquettes a rather wet mixture was adopted, in the proportions of two and a half of stone dust to one by volume of cement. The briquettes were broken after having been kept three years in water, and the results showed a strength of fully fifty per cent greater than that of briquettes mixed with the best sand obtainable. Although individual series of tests are never conclusive, the results to which we refer clearly suggest that those of our readers who are large users of cement mortar and concrete will do well to make independent inquiry on the subject.

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GENERAL BUILDING NEWS.

EPISCOPAL CHURCH, KIRRIEMUIR. — The foundation-stone of the St. Mary's Episcopal Church, now in course of erection at a cost of about 3,000*l.*, was laid recently. Plans for a building estimated to cost about 3,000*l.* were prepared by Messrs. Bucknall and Cowper, architects, Westminster. The chancel will be 30 ft. in length, 15 ft. wide, and about 25 ft. in height internally. Immediately west of it and the vestry on the south side will be a porch, and above this the organ will be placed, having a projecting front within the first bay of the nave. The three remaining bays, as well as the tower—which, when built, will make a fifth bay to the nave—will each have a pointed window of four lights. On the north side, four arches and piers, without capitals, will separate the nave from a narrow aisle containing windows only at its two ends. The east end of this aisle will eventually be screened off from the nave to make a small chancel for daily services. The width of the nave will be 20 ft., and its length 60 ft., or, with the tower, 81 ft.; and its height 29 ft. to the apex of the plain barrelled ceiling. The tower will be 25 ft. square without its buttresses, and about 50 ft. high to the top of the parapet; and the stone steeple 40 ft. higher.

RESTORATION OF SYDLING ST. NICHOLAS CHURCH, DORSETSHIRE.—This building has just been reopened after restoration. The work has been carried out under the direction of Mr. Ponting, the diocesan architect. The floor of the church has been raised and laid with concrete, and the old tombstones with which it was paved have been removed and replaced by wood blocks. The old-fashioned, high-backed wooden pews have been cut down, and the old oak of the church has been used in making the choir stalls, and the oak pulpit is in keeping with it. The gallery at the west end of the church has been swept away, opening to view the tower arch and the west window. Some carved wooden panelling was brought to light from behind the hot-water pipes. The restoration has been carried out by Messrs. Hann and Son, of Beaminster. The total cost has been a little over 600*l.*

BIBLE CHRISTIAN CHURCH, EASTLEIGH.—The foundation stones of the new Bible Christian Church, Cranbury-road, Eastleigh, were laid on Easter Monday. The building, which faces Leigh-road, is being erected at a cost of 2,000*l.*, and will seat 350. The plans for the same were prepared by Mr. A. H. Haines, the builder is Mr. Nichol, of Bitterne Park, whilst the clerk of the works is Mr. G. Truckel.

R.C. CHURCH, SHEPHERD'S BUSH.—The new Roman Catholic Church, which has been erected in Ashchurch-grove, Shepherd's Bush, was recently opened. The cost of the structure has been about 4,500*l.*, and accommodation is provided for 400 persons. Mr. J. McManus, of Hammersmith-road, has carried out the work from the designs prepared by the Rev. Canon Scoles, of Basingstoke. The style of the building is Gothic.

NEW WESLEYAN CHURCH, VICKERSTOWN, BARROW-IN-FURNESS.—The memorial stones of this church were laid recently. The new edifice has been designed in the Early English style, and the architect is Mr. John F. Curwen, of Kendal. The church will accommodate 400 worshippers.

CONGREGATIONAL CHURCH, SUNDERLAND.—The new Congregational Church which has been erected in Roker Baths-road, Sunderland, was recently opened. The edifice has been built of Hancoat pressed bricks, with stone dressings, in the Gothic style, and will seat about 520 people. The contractor for the work was Mr. J. B. Stott, Monkwearmouth, and the architects were Messrs. Joseph Potts and Son, of Sunderland.

NEW METHODIST CHURCH, BELFAST.—The foundation stones of the new Jennymount Methodist Church, Belfast, were laid recently. The contractor for the work is Mr. James Kidd, and the architect is Mr. W. D. R. Taggart.

NEW BAPTIST CHAPEL, NORWICH.—The erection of a new Baptist Chapel in Dereham-road, Norwich, has just been started. The plans for the new building have been drawn by Mr. A. F. Scott, architect, Castle Meadow, Norwich, and the contract of 2,856*l.* has been secured by Messrs. A. Boddy and Son, also of Norwich.

WESLEYAN SCHOOL CHAPEL, WORSLEY MESNES, LANCS.—The foundation stones of this building were laid on Easter Monday. The work is being carried out by Messrs. J. Johnson and Sons, builders, according to the plans of Messrs. J. B. and W. Thornley, the architects.

SUNDAY SCHOOL, WHITTINGTON MOOR, DERBYSHIRE.—The foundation stones of a new Free Methodist Sunday School at Whittington Moor were laid a short time ago. The total cost of the new building, including the site, is estimated at about 2,000*l.* The contract for the work has been let to Mr. Jas. Stubbins for 1,700*l.*, and Mr. Willis Glossop, of Chesterfield, is the architect.

SCHOOL, BOLTON.—Memorial stones were laid recently of a new school which is being erected at the bottom of Ulleswater-street. When completed the school will consist of an assembly hall 68 ft. by 32 ft. with six large class-rooms, and seven smaller rooms, and a gallery on three sides, and is calculated to accommodate upwards of 600 scholars. The infant school is 28 ft by 19 ft. and is estimated to hold 120 children. The choir and organ have provision made for them in the gallery. There will be cloak-room accommodation, and also a kitchen range with the usual accessories. The building will be faced with Black Hill bricks and stone dressings. The architects are Messrs. Potts, Son, and Hennings (Bolton), and Mr. J. B. Thornley (Darwen), and the contractors are Messrs. Wm. Townson, Ltd.

GRAMMAR SCHOOL, PICKERING, YORKSHIRE.—The foundation stone of the new Grammar School at Pickering was laid on the 9th inst. The school is intended to provide accommodation for about seventy boys and girls. Mr. John Bilson, architect, of Hull, has prepared plans for building, and the contract has been let to Messrs. Thomas Marshall and Sons, of Pickering.

COUNCIL SCHOOL, HALIFAX.—The Halifax Education Committee opened on the 11th inst. a public elementary school. The new school is known as the Copley Council School, and it covers some 1,350 sq. yds. of land. It is built on the central hall principle. There is class-room accommodation for seating 212 scholars in the mixed department, and in the infants' department for eighty-eight infants and fifty babies, and there is also a babies' play-room. A manual instruction-room has been provided, with accommodation for twenty boys, and a cookery school, where forty girls can receive instruction. Outside there are playgrounds with sloping banks, which it is intended to lay out as shrubberies, covering in all 3,690 sq. yds. Mr. E. W. Booth was the architect.

R.C. FOREIGN MISSIONARY COLLEGE, FRESHFIELD, NEAR SOUTHPORT.—There was recently opened a new wing and other buildings at St. Peter's R.C. Foreign Missionary College, Freshfield, near Southport. The wing is situated on the west side, and it comprises on the ground floor a study hall, and new cloisters on south, east, and west sides, forming a quadrangle. On the first floor is arranged a dormitory for thirty students, with prefect's room and conveniences arranged off the main landing, which is reached by a stone staircase from the west cloister. The spaces in roof have been utilised for storage and are well lighted. Other alterations and improvements in the existing buildings have been effected. A detached building as an ironing room, with patent drying closet therein, and other conveniences, approached by a long covered way, have also been erected in the grounds. The chapel has been redecorated to especial designs by the Rector. A new high altar has also been erected by Mr. A. W. Wall, of Cheltenham. The total cost is about 2,500*l.* The heating is by Dilworth and Carr, of Preston. The laundry and drying-room fittings are by Thomas and Taylor, Ltd., of Stockport, whilst Messrs. Formby Bros., of Formby, were the general contractors. Mr. Frederick H. Peats, of Liverpool, was the architect.

KELVIN-GROVE SCHOOL, GATESHEAD.—The section for seniors at the Kelvin-grove School, Bensham, Gateshead, has just been opened. The building is faced throughout with Commondale red facing bricks; stone dressings are used up to the first floor, and buff terra-cotta dressings to all gables and parapets. The premises have been erected from the design and under the supervision of Messrs. Nicholson and Dotchin, architects, Newcastle, whose plans were selected in competition. The building contracts amount to about 18,000*l.*, this including the infants' and junior schools, senior boys' and girls' school, playgrounds, sheds, latrines, and caretaker's house. The schools are arranged on the central hall plan. The accommodation provided in the infants' and junior block is for 760 scholars, as follows:—Ground floor—400 infants in seven class-rooms, with places for sixty-six, fifty-six, and forty-five respectively. First floor—360 junior boys and girls, in seven class-rooms, with places for sixty, fifty, and forty respectively. The accommodation for the senior scholars is arranged similarly to the juniors, and provides for 720 scholars in class-rooms and, if necessary, classes of sixty scholars each could occasionally be placed in the central hall, making a total of 840 senior scholars, whereby the full scheme provides for 1,480 scholars. The whole of the class-rooms are arranged around the central hall, where by the use of glazed screens, the head teacher is enabled to have the full supervision of the whole of the class-rooms, and have direct access to any particular room without having to traverse the corridors. Small pass doors are arranged between all class-rooms. Two class-rooms in the infants' and junior school on each floor are divided by folding screens to allow of them being formed into one large examination-room when necessary. The teachers' rooms are situated on a mezzanine floor arranged between the ground and first floor cloak-rooms—one to each department. The ground floor teachers have a small private stair from the cloak-room, while the teachers on the first floor have access to their room from the half landing of the main staircase. The infants' and junior block is placed to face Kelvin-grove, while the senior block faces Brighton-road. A caretaker's house has also been erected. The whole of the work has been carried out by Mr. Thomas Hunter, of Washington, as general contractor, with Mr. Creighton as clerk of works, the sub-contractors being:—Concrete floors by the New Expanded Metal Company (Messrs. Walker and Sons, Gallowgate); plumbing by Messrs. Allison and Son, Gateshead; slating by Mr. Charles Nicholson, Newcastle; painting and glazing by Mr. Thomas Dellow, Low Fell. The heating has been executed by Messrs. Richardson and Co., of Darlington. Wrought-iron pipes and radiators are used throughout arranged on the low-pressure system. The school furniture and fittings have been supplied by the North of England School Furnishing Company, Messrs. Illingworth, Ingham, and Co., Leeds, and Mr. Thomas Stockdale, of Gateshead. The cloak-room hat and coat fittings are of malleable iron, manufactured by Messrs. Brookes and Co., Ltd., Manchester, with wire screen divisions and gates arranged to enable the cloak-rooms to be locked up when desired. The lavatories are of Jardine McMath's patent trough arrangement, executed in marble and supplied by Messrs. Emley and Sons, Ltd., Newcastle.

IMPROVEMENTS IN WALWORTH, S.E.—The Ecclesiastical Commissioners have availed themselves of an offer made by Miss Octavia Hill to undertake the accomplishment of a scheme she has formulated for carrying out a greatly needed local improvement in Walworth. Miss Hill's project comprises the removal of some dilapidated property, covering about 22 acres, belonging to the Commissioners, of which the lease has recently expired, and the erection thereon of dwellings for the industrial classes. The dwellings will consist of cottages, cottage-flats, and three-room and two-room tenements, to accommodate a total of 800 residents in 2,447 rooms. None of the tenement-houses will have more than three stories, and an acre of the land is to be set aside as a recreation-ground. The Commissioners, it is said, will be satisfied with a profit return of a little under 4 per cent.

MIDLAND STATION BUILDINGS, SHEFFIELD.—The extension of the Midland Railway passenger station at Sheffield is making considerable progress towards completion, some of the new portions being already in use. The whole scheme is expected to be in thorough working order by the end of the year. The station has not only been widened, but lengthened. The new telegraph office is in a similar position to that now in use, namely, at the south end. Next to this is the parcels' office, a large room 120 ft. long by 65 ft. wide. In the front is a covered way under which from fifteen to twenty vans are able to load at the same time. The cloak-room adjoins the parcel office, in close proximity to which is a hydraulic luggage lift and a new luggage bridge connecting with the old platform. For vehicles there are two covered ways: the departure, for passengers going away by train, and the arrival, which is really the exit from the station. These courts are 350 ft. long by 56 ft. wide. Between these is the footway which leads into the general entrance hall, which covers a space of 90 ft. by 42 ft. Adjoining is the booking office. Ascending a flight of steps, the entrance hall leads to a new footbridge, crossing from one side of the station to the other. The existing footbridge is to be removed to the north end of the station, and will be connected with an additional "way out" at that point. There will also be a luggage bridge at this end. On the north side of the entrance hall will be the station-master's offices, the waiting and refreshment rooms. The new permanent way consists of four sets of lines. The new platforms, which are 870 ft. long and 25 ft. and 30 ft. wide respectively, are without a single column, the awnings being carried by steel cantilevers. The footbridge from Granville-street has been extended over the new lines, and ends near the new parcel office. The docks at the north end are also being altered. Out of the old buildings that remain, more waiting rooms will be provided. The old parcel

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office is being pulled down to allow for the luggage bridge and steps to the platforms. The buildings are from the design of Mr. C. Trubshaw, the company's architect, Derby, and the work is being done by Messrs. G. Longden and Son, Sheffield. The reconstruction is being supervised by the resident engineer, Mr. J. Brunton.

MEMORIAL HALL, BRIGHOUSE, YORKSHIRE.—A new hall, built at the Bridge End Congregational Church, Brighouse, in memory of the late Alderman Henry Sugden, has just been opened. The hall has been erected from plans by Messrs. Sharp and Waller, architects, Brighouse, over a series of one-story class-rooms, and has a frontage to the main road connecting Brighouse and Rastrick. It is built of the local hard stone, with ashlar front and dressings, and seats over 600 persons. The total cost has been about 1,800*l*.

FIRE STATION, BOOTLE.—The new Central Fire Station, situated in Strand-road, Bootle, has been erected by Mr. W. Musker, of Bootle, the architects being Messrs. Anderson and Crawford, Liverpool. On the ground floor the engine-house faces Strand-road, with the superintendent's and deputy-superintendent's houses on either flank. A superintendent's office is provided, and also a duty room and clerk's office. The stables will accommodate eight horses, and are situate in the rear of the engine-house, divided into two portions by a covered yard. There is a harness-room and also loose boxes. An escape shelter faces Pacific-road. Houses on the flat system have been built for twenty married men, and there is a hose-drying tower 100 ft. in height. On the north-west corner of the land facing Pacific-road there is a police-station, including quarters for a married and a single man, charge office, and four cells. On the first floor over the engine-house are situated the single men's quarters, and every man will have his own separate cubicle, with the use of a common kitchen, messroom, and recreation-room. Sliding poles are carried down to the engine-room, and a flat over the stable and harness-room will be used as a promenade for the men off duty. The married men's quarters on this floor are in all cases a repetition of those below them, and access to them is obtained from balconies reached by central staircases. A wash-house and drying compartments have been arranged over the workshop. In the basement there is accommodation for storage purposes, with coal vaults and boiler-house for the main heating apparatus. The front elevation of the building is faced with red pressed brick, and the other portions of the building are built in best quality grey bricks, the whole being relieved with red sandstone dressings. Internally the engine-house and cells will be lined with glazed bricks. In the yard there is a cement platform, on which hose may be scrubbed.

FREE LIBRARY, GOOLE.—The memorial stone of the new Free Library at Goole was laid on the 28th ult. The new library will cover an area of about 400 sq. yds., having a frontage of about 50 ft. to the south side of Carlisle-street, and a total depth of about 72 ft. The accommodation on the ground floor will consist of a reading-room, an entrance hall leading to the counter of the lending library, a juvenile room, and a reference library, and offices. Nearly the whole of the second story will be taken up for a lecture-room. Externally, facing Carlisle-street, the building will be of red brick, with red Ruabon terra-cotta facings. Mr. H. B. Thorpe is the architect.

WAREHOUSE, DERBY CO-OPERATIVE SOCIETY.—The new warehouse built for the convenience of the members of the Derby Co-operative Society, Ltd., in Wood-street, Derby, was opened recently. The warehouse is 128 ft. long and 78 ft. wide. It is five stories high. The architect for the work was Mr. A. Macpherson, of Derby, and Messrs. Eastwood, Swingler, and Co. had the contract for the iron and steel work, with the exception of the windows, which have been supplied by Messrs. Brown and Co., of the Nelson Foundry, but the whole of the other work has been carried out by the Society's own workmen, under the superintendence of the Building Committee.

MORTUARY, RICHMOND, SURREY.—The work of the conversion of a part of Eton Lodge house and grounds, Paradise-road, into a mortuary and post-mortem room has been carried out by the Health Committee of the Corporation. The work of alteration and erection has been carried out by Messrs. W. J. and A. Long, the electric lighting is by Messrs. Hemingway and Pritt, and Messrs. Reynolds and Co. have supplied the ironwork, sanitary apparatus and fittings. The Borough Surveyor is Mr. Brierley.

MINERS' HALL, CAMBOIS.—The foundation stones of the new hall and institute for the Cambois miners were laid on the 9th inst. The building, which has been designed by Mr. Thomas Tulip, of Choppington, will comprise, on the ground floor, reading, billiard, smoke, and commitee rooms, together with apartments for a resident caretaker, whilst on the first floor the space is to be utilised for a hall and lecture-room to accommodate about 600 people, and to be fitted up with a platform and retiring rooms. The estimated cost of 2,000*l*., and the contract for its erection has been placed with Messrs. Cook Bros., of Blyth.

VILLAGE HALL, LLANDEGFAN, ANGLESEY.—A new hall has just been opened at Llandegfan. The plan of the hall is that of a central entrance hall, entered through an external porch, and with a hall 43 ft. by 22 ft. opening out of it on one side, whilst on the opposite side a door leads to the caretaker's cottage. The large hall is divided by a folding partition into two rooms, the smaller intended for a smoking and reading room, and the larger for a committee room, etc. For meetings and entertainments the two rooms would be thrown into one. In the entrance hall is a large red brick fireplace, with a tablet 6 ft. long, worked in copper by Mr. R. L. B. Rathbone, in commemoration of the gift of the building and land. The internal woodwork is stained green. The work has been carried out by Mr. Evan Parry, Menai Bridge, from the designs of Mr. Harold Hughes, architect, of Bangor.

CLUB PREMISES, SHEFFIELD.—The premises of the Sheffield Club in Norfolk-street, Sheffield, were recently reopened after having been enlarged and redecorated. Messrs. John Eshelby and Son were the builders, and the furnishing was carried out by Messrs. Waring and Gillow. The architect was Mr. H. I. Potter, of Sheffield, whose designs were selected in competition.

NEW INFIRMARY, NEWCASTLE.—The new infirmary buildings on the Leazes were on Saturday last week inspected by members of the Northern Architectural Association. Mr. W. Lister Newcombe, Newcastle, and Mr. H. Percy Adams, of London, are the architects for the building, and Mr. H. Cockrell is the clerk of works. The frontage facing the Leazes Park is 777 ft., and that on the eastern side, almost opposite the Durham College of Science, 536 ft.

CARTWRIGHT MEMORIAL HALL, BRADFORD.—The Cartwright Memorial Hall, which has been erected in Bradford as Lord Masham's tribute to the memory of Dr. Cartwright, the inventor of the power loom and other machinery in connexion with the textile industry, has just been opened by Lord Masham. Competition was invited for plans and designs, and Mr. Alfred Waterhouse, R.A., awarded the first premium of 150*l*. to Messrs. J. W. Simpson and E. J. M. Allen, of London. The hall is erected on the site of the old mansion in Lister-park, where formerly his lordship resided. The design is of Italian Renaissance type, based on coupled Ionic columns and pilasters, with appropriate entablature, standing on a basement of rusticated rock-work. A feature is the tower, which is advanced from the front of the main building, its lower stages being supported on large arches and serving as a porch, through which carriages can drive. On the ground floor of the building is a large hall, ending in a semi-circular apse, 28 ft. wide and 57 ft. in length. The roof of this rises to the full height of the building, which in other parts is divided into two stories. On each side of the building there is a large museum hall. On the first floor there are the art gallery and the banqueting hall, with service room. There is also a reception hall for the mayor, and this communicates with a large balcony over the main carriage entrance, a drawing-room, and a black-and-white room. In the basement there are a refreshment room, a kitchen, larders, store rooms, and a workshop for the art-gallery staff. The rooms are adapted for use on occasions of public importance. The statue of Dr. Cartwright, which the Bradford City Council have commissioned of Mr. H. C. Fehr, will be placed in the reception hall. It is carved in white marble, and stands on a marble pedestal. Mr. A. Broadbent modelled and carried out the decorative sculpture on the building. The following are the principal contractors:—Excavators, masons, and bricklayers' work, Mr. William Farnish, of Bradford; carpenters and joiners' work, Mr. W. H. Pick, of Bradford; plumbers and glaziers, Messrs. H. Braithwaite and Co., of Leeds; slaters, Messrs. Hill and Nelson, of Bradford; plasterers, Messrs. T. Cordingley and Son; founders and smiths' work, Mr. Robert Hollings Dewhirst, of Bradford; painting, Mr. John Hankins, of Bradford; electric lighting, Messrs. Woods, Slack, and Co., of Blackburn; heating and ventilating, Mr. J. Jeffreys, of London; entrance gates and electric fittings, the Bromsgrove Guild of Applied Arts, of Bromsgrove, Worcestershire, and Mr. Omar R. Albrow, of London; wire fencing and gates across the main drive, Messrs. Blunt and Wray, of London; cooking apparatus, ranges, and utensils, Messrs. Leggotts, Ltd., of Bradford; asphalting and damp-courses, Messrs. George Greenwood and Sons, of Halifax; marble paving, the Arts Pavements, Ltd., of London; and locks and door-fittings, Messrs. Gibbons, of Wolverhampton. Mr. T. B. Sage has acted as clerk of works.

MEMORIAL HALL, ALTHORPE.—A hall has been erected at Althorpe in memory of the late Mr. W. Stephenson, J.P. The hall has been built by Messrs. Johnson and Waite, Epworth, under the supervision of Mr. J. F. Waite, and the woodwork by Messrs. Birks Bros., of Althorpe. The building contains public-room, game-room, and reading-room above. There is also a kitchen erected at the rear of the building. The architect is Mr. H. Kelsey, of Epworth.

BUSINESS PREMISES, GLASGOW.—Plans have been passed by the Dean of Guild Court for the erection of new business premises in Jamaica-street, Glasgow. The architect is Mr. George Bell, St. Vincent-street, Glasgow.

CO-OPERATIVE SOCIETY'S NEW PREMISES, BELFAST.—The new central premises of the Belfast Co-operative Society, Ltd., in Agnes-street, Belfast, were opened recently. The contractors for the work were Messrs. M'Laughlin and Harvey, and the architect Mr. W. J. Gilliland.

PROPOSED PAVILION AND DANCING HALL, AYR, N.B.—At the meeting of the Ayr Town Council on the 11th inst. there was submitted a minute of the Attractions Committee, containing reports by Mr. John Young, Burgh Surveyor, on the proposed scheme for utilising part of the Low Green or the Jail Green for the purpose of providing means of recreation for inhabitants and visitors. In his first report Mr. Young proposed to utilise the green behind the prison for (1) a pavilion or concert and dancing hall, to cost 7,500*l*.; (2) public baths, to cost 9,500*l*.; and (3) ornamental open space or garden, to be laid out at a cost of 750*l*. In a subsequent report he estimated the cost of erecting a pavilion and dancing hall on the site at the northern end of the Low Green, south of the prison, at 10,000*l*. The committee did not think the public baths should be proceeded with meantime, but recommended that a pavilion and other accessories be erected on a site on the Low Green, that competitive designs be invited for pavilion to cost 9,000*l*., and that premiums of 50*l*., 30*l*., and 20*l*. be offered for designs, to be lodged by July 1.

IMPROVEMENTS AT BALLS BRIDGE, DUBLIN.—The new Art Industries Hall and the enlargement of the East Hall, at Balls Bridge, Dublin, are now nearing completion for the Royal Dublin Society. The architect is Mr. P. H. M'Carthy, of Dublin. The cost of the Art Industries Hall is estimated at about 5,000*l*.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOWS, ST. THOMAS'S CHURCH, STAFFORD.—There have just been placed in this church two stained-glass windows, designed and executed at the studios of Messrs. Kayll and Co., Leeds. The aisle window illustrates Christ's charge to Peter, "Feed my sheep." Christ is standing with raised hand speaking the words, while Peter is kneeling at his feet. The robe of Christ is a rich ruby, with ornamental border and a white under-dress. Peter is clothed in garments of yellow and violet blue. Sheep are standing near. Angels are holding a scroll with the text in the base of the windows, and the whole is surmounted by a canopy. The chancel window has a single figure of the Good Shepherd.

COMMEMORATION WINDOW, LEEDS.—In commemoration of the jubilee of St. Michael's Church, Buslingthorpe, Leeds, a stained-glass east window has been placed in the edifice. The work was designed and executed by Messrs. Kayll and Co., of Leeds.

EMANUEL CHURCH, SOUTHPORT.—A four-light stained-glass window has been executed and fixed in this church by Messrs. Percy Bacon and Brothers, of London. In the first light, the subject is Cornelius, the centurian; in the second, Cornelius and the Angel; while in the third, Cornelius and St. Peter; and the fourth light depicts Cornelius and the descent of the Spirit. Angels fill the tracery lights over these subjects.

MEMORIAL WINDOW, HIMBLETON.—A new stained-glass east window has been placed in the parish church at Himbleton, in memory of the late Sir Douglas Galton. The window consists of a triplet of lancets with the centre light higher and slightly broader than the sides ones. The artist for the work was the late Mr. George Ostrehan.

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SANITARY AND ENGINEERING NEWS.

SEWERAGE WORKS, MELTHAM.—The Meltham Urban District Council's sewage outfall works at Bent Ley, about a mile outside the village, were opened on the 8th inst. The works have been constructed on the bacterial oxidation system, and have a capacity for dealing with 120,000 gallons per day on dry weather flow for a population of 6,000, and 360,000 gallons during storms. The works consist mainly of three detritus tanks and three anærobic bacteria beds of broken stone. The estimated cost of the works, including sewers and easements, is about 14,000*l.* The works have been constructed by Mr. Fred Earnshaw, of Meltham, from plans prepared by Messrs. J. B. Abbey and Son, engineers, Huddersfield.

DRAINAGE, CROWBOROUGH.—On the 14th inst. Mr. H. P. Boulnois, M.Inst.C.E., opened a Local Government Board Inquiry into the application of the Uckfield Rural Council to borrow 41,500*l.* for works of drainage of Crowborough. Mr. Taylor, of Messrs. John Taylor, Son, and Santo Crimp, the engineers to the District Council, gave full details of the scheme.

SEWAGE SCHEME, WIGMORE, HEREFORDSHIRE.—Mr. F. H. Tulloch, M. Inst.C.E., Inspector of the Local Government Board, held an inquiry at the Wigmore Police Court, on the 12th inst. relative to the application by the Wigmore Rural District Council to borrow the sum of 2,000*l.* for purposes of sewerage and sewage disposal for the Parish of Wigmore. Mr. J. E. Willcox, engineer, Birmingham, gave evidence as to the scheme he had prepared.

FOREIGN.

FRANCE.—The Académie des Beaux-Arts proceeded on Saturday last with the election of a "membre libre," in place of the late M. Corroyer. M. Henri Bouchot, curator of engravings at the Bibliothèque Nationale, was elected by twenty-five votes out of forty-three. The new member is Vice-President of the Society of Antiquaries of France, and was the organiser of the exhibition of the Primitifs Français. He is the author of some excellent works on French art of the XVth and XVIth centuries. The exhibition of the "Primitifs" just referred to, arranged at the Pavillon Marsan, brought together for public exhibition, for the first time, treasures of art which were dispersed in different places, and many of them hardly known.——M. Leonce Bénédite, with the assistance of the Société des Amis de Luxembourg, has organised in that museum an exhibition of the works of modern masters belonging especially to the period 1860-1880. It includes works by Paul Baudry, Cabanel, Bonnat, Jules Breton, Henner, J. P. Laurens, Puvis de Chavannes, Vollon, etc., as well as some artists of the Impressionist school, such as Manet, Sisley, Monet, and Pissaro. ——M. Prath, architect to the Department of the Indre et Loire, has been commissioned to carry out, at Tours, a large gendarmerie barracks, at a cost of 465,000 francs.——The statue of Mariette Pacha, the work of M. Denys Puech, has just been erected at Cairo, in the centre of the museum of Egyptian antiquities.——The jury of the Ecole des Beaux-Arts, appointed to decide in the competition for the Prix Chenavard in the section of architecture, have awarded the prize to M. Fournier and M. St. Maur, as equal. The subject was a design for a Galerie des Fêtes.——M. Chaussemiche, Inspecteur des Bâtiments Civils, has been appointed architect to the Ecole des Langues Orientales, in place of the late M. Faure-Dujarric.——The death is announced, at the age of sixty-four, of the sculptor Anatole Marquet de Vasselot. He made his first appearance at the Salon in 1866, exhibiting a portrait bust. He was the author of the bust of Balzac in the Théâtre Français, of the statue of Scribe at the Hôtel de Ville, the statue of Lamartine at Passy, and that of Henri Martin at St. Quentin. We owe to him, also, the statue of Admiral Mouchez at the Observatory, and the monument to Commandant Dampierre at Bagneux. M. de Vasselot was a pupil of Le Bourg, of Jouffroy, and of M. Bonnat the painter. He was also an accomplished writer on the history of art, and, among other works, wrote a "History of Portraiture in France," for which the Prix Bordin was awarded to him. He had received medals in 1873 and 1876, and the Legion of Honour in 1886.

GERMANY.—The Law Courts at Mülhausen are completed; the building was carried out according to the designs of Herr Kuder and Herr Müller.——The museum at Trier is to be enlarged; the work has been intrusted to Professor Hocheder.——The theatre at Darmstadt is to be completely rebuilt from the designs of MM. Fellner and Helmer.——The ancient Court of Justice at Baden is to be restored at a cost of 20,000 fr.——The remains of the ancient "Lusthaus" at Stuttgart are to be set up in the public gardens of that town; the more artistic details of the building, such as doors, windows, columns and capitals, etc., are to be formed into an arcade measuring 31 m. in length and 6 m. in width——In order to ensure that Architecture shall be worthily represented at the Berlin Art Exhibition of 1904, the Society of Berlin Architects has formed a committee, consisting of Messrs. Balck, Bangert, Reinhardt, Schmitz, and Werle.—— The church of St. Sebaldus, at Nürnberg, has been restored.——The new members of the Berlin Academy of Arts are:—Messrs. August Gaul, Alfred Meszel, Okar Frenzel, F. Kallmorgen, and Albert Krüger.——A memorial to Friedrich List, the political economist, is to be erected at Kufstein, after a design by the sculptor, Herr Norber Pfretschner: List is represented sitting deep in thought in a Greek colonnade, whilst a female figure holds over him a laurel wreath.

AUSTRIA.—The new Technical Institution at Vienna was opened by the Emperor on March 12. The architect, Professor Ulrich, was presented to His Majesty.——MM. Herr Fellner and Helmer have undertaken to design and to superintend the building of the theatre at Klausenberg.——A new hospital is to be built at Graz.——The tower of the Town Hall at Brünn is to be rebuilt and raised about 4 or 5 mètres.——The parish church at Braunau is to be restored under the supervision of Herr Matthias Schlager.——A new university is to be built in Vienna, which is to be divided into departments for the study of hygiene, pathological histology, and bacteriology; the designs for the building were submitted by the architect, Herr Falkenau, under the direction of Herr Fellner, in 1900. ——The theatre at Olmütz is to undergo extensive alterations, in order to ensure the safety of the public in the event of an outbreak of fire. Herr Wilda has undertaken the decorations of the Council Chamber at Olmütz.——The architect, Julius Wagner, has been entrusted with the designing of the new Justizpalais at Szeged.——A new theatre is to be built at Krems, designed by Herr Josef Utz.——The church of St. Nikolaus, in Jaromer, is to be restored, and by separating the roofs of the side aisles from that of the central aisle, the building will again appear in its exterior as well as its interior, in its original form of a basilica.

SWITZERLAND.—The engineer, F. J. Weiss, died on March 24, in his fifty-sixth year, at Basle.——Herr Robert Hartmann, director of the gasworks at Venice, died there on March 22, in his fifty-third year.——A new Evangelical church is to be built at Alstätten, from the plans of Herr Paul Reber.——New schools are to be built at Rappenswil, from the designs of the architects, Adolf Goudy and E. Walcher; the building will cost 177,000 francs.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —Mr. W. M. Mitchell, architect (Dublin), has removed from 5, Leinster-street to 10, St. Stephen's-green, Dublin.——Messrs. J. B. Colwill and Son, quantity surveyors, have removed from St. Albans to 60, Gladstone-road, Watford.

SANITARY CONDITION OF LONDON RESTAURANTS. —The report of the Medical Officer to the City of London for the four weeks ending March 12 contains the following comments on what has been observed in regard to the condition of kitchens and kitchen staff in a good many London restaurants. After premising that underground rooms are exceedingly unsuitable for kitchens, but that in many cases no other position appears possible under the circumstances, the Report continues:—"The nature of the fuel used in cooking is of considerable importance, affecting as it does the smoke problem, and the adoption of gas-ovens where it is possible is always an advantage, especially when constructed so that fumes do not come in contact with the food during the process of cooking. The sanitary condition of the kitchens of restaurants in the City is a very important one, owing to the extremely limited space at disposal and the difficulty of providing proper accommodation for the storage of food. This question, amongst others, has been anticipated by your worshipful Committee, who presented a report recommending the granting of certificates of the sanitary condition of kitchens, etc., which was approved by the Court of Common Council in January last. Without any attempt at classification, the following are a few matters which require special attention:—In some cases the occupiers were ignorant of the existence of storage cisterns, and their condition when examined need not be described. In many cases the cover was missing, and the cistern inaccessible for cleansing. The want of proper lavatory basin accommodation for the personal ablution of *employés* makes cleanliness difficult, and the use of a sink, full of vegetables, dirty plates, etc., is often the only means at hand. Washing facilities should in all cases be provided near the kitchen, and also sufficient water-closets and urinal accommodation so situated as to obviate sinks, gullies, and coal cellars being used in an improper manner." [We omit some exceedingly unpleasant details as to the conditions in which water-closets used by the employees are often found.] "Clothing worn in the kitchen does not in all cases receive the attention it demands. The workers frequently change their clothes and work in evil-smelling garments, whose only claim to respect is antiquity, and in some cases a dirty condition of the workers themselves has been noticed. Tables, benches, and cooking utensils were frequently found in a dirty condition. These should, of course, be efficiently scrubbed and cleansed daily. The notice of *employés* has been directed to many of the matters enumerated, and not, I am glad to say, altogether without effect."

OVERCROWDING AT BRIGHTON.—Dr. Newsholme, Medical Officer of Health for Brighton, recently recommended that the Brighton Town Council should purchase houses in narrow, illlighted streets and courts as they came into the market, pull down some to give more air and light, put the remainder into thorough repair, and let them at rentals within the means of the present class of occupiers. After considering the report the Sanitary Committee asked the Council to be allowed to pay a visit to Camberwell, where the scheme in question has been tried with very satisfactory results. They also recommended that the proposal of the Medical Officer of Health should be carried out on a tentative and experimental scale, so as not to throw any burden on the rates except for the expense of demolition. The Town Council, by twenty-four votes to sixteen, has decided to reject the proposed scheme. The principal arguments against it are that the circumstances of Camberwell are different from those of Brighton, that possibilities of jobbery would exist under such an arrangement, and that it would have a tendency to set up an inflated value for house property of this description. Up to the present time the cost of clearing away insanitary areas in Brighton is stated to be 71,226*l.*, while the cheapest single cottages the Town Council has been able to build are let at 6s. 6d. a week.—*Morning Post.*

A NEW THEATRE IN SHAFTESBURY-AVENUE. —The almoners of Christ's Hospital have just let at a ground rent of 7,300*l.* per annum the eighty years' building lease of the site now occupied by Nos. 35-49 (odd), Shaftesbury-avenue, and by seventeen houses in Wardour, Rupert, and Upper Rupert streets, Soho, which cover an aggregate area of about 23,400 ft. superficial. The lease has been acquired by Mr. Jacobus, one of the present tenants, who intends to rebuild his own business premises in Shaftesbury-avenue and to arrange for the erection of a theatre upon the remainder of the site.

THE LABOUR MARKET IN THE COLONIES.—The April circular of the Emigrants' Information Office states that this is the best time of the year for emigration to Canada. The building, metal, engineering, shipbuilding, and manufacturing trades generally continue busy, and skilled men, such as carpenters, bricklayers, painters, plumbers, blacksmiths, iron moulders, printers, boilermakers, woodworkers, lathers, waggon makers, coopers, iron and brass workers, etc., have no difficulty in procuring work at good wages. In Australia there is not much demand for more labour, though the bountiful harvest is likely to improve prospects. Western Australia and Queensland offer openings at the present time for a limited number of mechanics, such as carpenters, blacksmiths, masons, bricklayers, and wheelwrights. There is no demand for miners. In New Zealand nearly all trades are well employed, and competent mechanics have no difficulty in finding work. In Cape Colony no persons are now allowed to land unless they have secured definite employment in the Colony and possess 20*l.* on arrival. The labour market is overstocked, and a great many mechanics and labourers are unable to obtain work. There is, therefore, now no opening for mechanics in the building or other trades. Employment in the building and other trades in Natal has fallen off, so that labour is plentiful, and large numbers of unskilled workers and indifferent tradesmen are unable to obtain employment. Emigrants, therefore, other than those obtaining nominated passages, are warned against going to Natal at the present time on the chance of work. No one can enter the Transvaal without a permit, and persons are warned against going there at the present time in search of work. The building trades are fairly busy, but the supply of labour is more

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than sufficient. The standard of work required from workmen in the Transvaal is very high in all trades and inferior men have no chance of employment, and the cost of living generally is from two to three times as much as it is in this country.

ITALIAN EXHIBITION, EARL'S COURT.—Next month the Italian Exhibition will be opened in the grounds at Earl's Court. The new buildings comprise an Italian village, with gardens and tea-ground, and in the western part of the grounds are to be displayed two large canvases, painted by Mr. Richard Douglas, depicting Isola Bella and Lago Maggiore. The alterations are being carried out by the London Exhibitions, Ltd., to which company Mr. A. O. Collard is architect.

OPEN SPACES, LONDON.—It is announced that the amount of 40,000*l.* for the purchase of the Springfield Park Estate, at Upper Clapton, is now practically assured. The park consists of 33 acres, bordered by the river Lea, well timbered, and commanding a fine prospect. The Hackney Borough Council and the London County Council subscribed 10,000*l.* and 20,000*l.* respectively towards the fund, and the latter Council will undertake the cost of maintaining the land as a public park. The Governors of the Regent-street Polytechnic Schools have concluded the purchase from the Duke of Devonshire of 21 acres near the riverside at Chiswick, which they will lay out as a recreation ground for the numerous clubs and teams belonging to that institution. The late Mr. Quintin Hogg set aside a sum of 5,000*l.* in that behalf, and Mrs. Quintin Hogg contributes 10,000*l.* towards the project; other subscriptions are promised, so that a balance of only 2,000*l.* is needed for its accomplishment by the provision of dressing-rooms and other accommodation, and the enclosing, draining, and levelling of the ground. An appeal is made for contributions to a sum of 12,000*l.* for the acquisition of 6 acres of meadow land in Trinity-road, as an addition to Brockwell Park, which, if secured will, as far as is now possible, preserve all the land which forms the natural park boundary, and prevent the southern side from being hemmed in by rows of small houses; the owner of the 6 acres has, it is stated, received an offer of 15,000*l.* for the land for building purposes, but is willing to meet the promoters' object by taking 12,000*l.* on condition that the fields are added to the park and the purchase money is paid within six months. The Metropolitan Public Gardens Association have under their consideration proposals for adapting the garden of Golden Square, Soho, for public resort, for preserving portions of the grounds of the Duke of York's School at Chelsea which will shortly be vacated on the removal of the School to Guston, in Kent.

THE ANTIQUITY OF CONWAY CHURCH.—Mr. Harold Hughes, of Bangor, lectured at Conway on Tuesday last week upon Conway Parish Church. Mr. Hughes said that there were records of a Cistercian abbey being in existence at Conway in 1136, and Giraldus Cambrensis referred to it in 1188. In all probability the abbey was founded in the earlier years of the XIIth century, and in 1233, when Edward built the castle and desired Conway to become a garrison town, the abbey was removed to Maenan, some miles up the river. It had been supposed that no trace of the abbey building at Conway remained; but in 1894, when the Cambrian Archæological Association visited Conway, he made an examination of the present church and read a paper on the subject at one of the Association meetings in which he was able to express the belief that the abbey occupied exactly the site of the present church, and that portions of the existing walls and certain of the features must have belonged to the original conventual edifice. The lecturer showed by means of plans, which, with a number of excellent photographs of the church, had been made into lantern slides by Miss Hadley, how the present fabric has probably been evolved from the cruciform Cistercian abbey. Windows existed to-day of the simple design used by the builders of the Cistercian order; certain walls were thicker in their lower part than in the part above, and were "weathered back" to keep out the rain where the narrowing took place. The arch of the western doorway had not been made for a doorway, being without a rabbet for the door to fit into. He observed marks which satisfied him that this arch had been moved, and it had most probably formed the entrance to a Cistercian chapel. The greater portion of the church appeared to have been rebuilt in the XIVth century, after its conversion into a parochial building. The existing building was practically a XIVth century Decorated church, and the great eastern window of the chancel was probably inserted in the XVth century, at about which period the upper part of the tower was added. A fine XVth century rood screen was found in this edifice, though it had been restored. Some XVth century lace of great interest had now been placed in glazed frames and hung in the parish room or west vestry. XVIth century features abounded, such as the memorials of the Wynns of Gwydyr and the inscription recording the name of one who was the forty-first child of his father. This inscription had been twice recut, however, and its accuracy could not be relied upon.—*Liverpool Mercury.*

WAR MEMORIAL, ALLOA, N.B.—A war memorial monument has been erected at the top of Mar-street, Alloa. Mr. R. S. Lorimer, R.A., was the designer for the work, and Mr. W. Birnie Rhind, of Edinburgh, the sculptor. The cost has been about 450*l.*

INSPECTION OF DANGEROUS BUILDINGS, MANCHESTER.—The Improvements and Buildings Committee of the Manchester City Council have adopted certain recommendations of Mr. Price, the City Architect, with regard to the inspection of dangerous buildings. The city is to be divided into six districts, and various inspectors are to be held responsible for the whole of the work appertaining to building inspection and also to dangerous buildings in their particular districts.

SHEFFIELD BUILDING TRADES' EXHIBITION.—On the 15th inst. an interesting Building Trades' Exhibition was opened at the Drill Hall, Sheffield. The affair is conducted by Messrs. G. D. Smith and J. W. Norman, of London. The exhibition, which will be continued until April 23, is the first of a truly representative character in connexion with the building trade held in the provinces. It has been the object of the management to conduct the exhibition on strictly trade lines, and everything has been eliminated that would lend to it the character and appearance of a bazaar. The undertaking does not comprise Sheffield and the West Riding alone, but invitations have been sent to all the well-known architects in Yorkshire, Derbyshire, Lincolnshire, Nottinghamshire, Lancashire, Leicestershire, Warwickshire, and Northamptonshire. It is hoped that the success of the venture will be such as to warrant it being made an annual event. Among the exhibitors are several local firms. The Barnsley British Co-operative Society, Ltd., show an improved ventilator for extracting foul air from churches, schools, etc. The Sheffield Engineers' Company have an improved horizontal gas engine fitted with the latest improvements enabling it to run for long periods without attention, in actual operation in the hall, and the Torpedo Ventilator Company exhibit several designs in their ventilators. On the stand of Mr. Henry Lingard are shown improvements in drainage appliances. Mr. T. W. Ward, Sheffield, has a display of the goods which he has for sale. Another stand is that of Messrs. Hodkin and Jones, Sheffield, who exhibit samples in marble mosaic paving, etc. Messrs. Pawson and Brailsford and Messrs. Woollen and Co. have also stands in the exhibition. An excellent display is given by the Clipper Belt Hook Company, Manchester, and a large number of firms from London and the big provincial cities and towns have stands in the hall.—*Sheffield Independent.*

WAR MEMORIAL, TONBRIDGE.—A war memorial, in the form of a tablet, was recently unveiled in the Parish Church, at Tonbridge. The memorial has been executed in copper bronze, under the direction of Mr. J. W. Little, architect, by Messrs. B. Dellagana and Co., the sculptor being Mr. L. Roselieb.

THE SANITARY INSTITUTE.—At an Examination in Practical Sanitary Science held at Birmingham on April 15 and 16, 1904, seven candidates presented themselves. The following two candidates were awarded certificates: H. T. Brainsby, Walsall; A. G. Harman, Leamington.

CAPITAL AND LABOUR.

EDINBURGH AND LEITH JOINERS' AND THEIR WORKING RULES.—A joint meeting of the Amalgamated and Associated Societies of Edinburgh, Leith, and District Operative Joiners was held in St. Cuthbert's Hall, Edinburgh, on the 7th inst., to hear the report of delegates at a conference with representatives of the Employers' Association with relation to proposed alterations on the working rules and regulations. The proposed alterations, which came from the Employers' Association, were as follows:—Working rules and regulations between the Edinburgh, Leith, and District Building Employers and Allied Trades' Association and the associations of the operative masons, bricklayers, joiners, and plumbers of Edinburgh, Leith, and district. (1) That the working hours be as follows:—From March 1 to October 31, fifty-one hours per week, being nine hours each ordinary day, and six hours on Saturday, with two stops for breakfast and dinner. From November 1 to November 30, eight hours per day, and five hours on Saturday. And from December 1 to January 8, seven and a half hours per day, and five hours on Saturday. From January 9 to February 20, eight hours per day, and five on Saturday. Only one stop for meals from November 1 to March 1. Overtime shall be paid as follows:—After the ordinary working hours have been wrought, time and a quarter up till 10 p.m., and time and a half thereafter until 6 a.m., Sunday double time. Work done on holidays to be paid time and a quarter. No overtime allowed unless in cases of emergency. (2) All workmen shall provide, at their own cost, the necessary tools requisite for their properly performing their different departments; employers or their representatives shall have authority to satisfy themselves from time to time that workmen are provided with proper kits of tools. (3) The following holidays to be recognised:—Three days at the New Year, four days at the trades' holidays, and the spring and autumn holidays. (4) In all cases workmen are to work full time at their jobs; arrangements as to country pay and allowances for being a certain distance from yard, shop, or office to be according to by-laws for the various trades. (5) That all apprentices be engaged for the various trades according to by-laws for these trades. (6) That suitable by-laws be drawn up for the different trades, to control any matter to which the foregoing rules may not apply. (7) That the foregoing working rules and regulations and the by-laws appended be equally binding on employers and employees for one year, beginning on June 1 in any year. Any alterations desired by either side to be intimated in writing not later than the first week of March, and, in the event of alterations being intimated by either side, parties to be allowed till March 21 to lodge counter proposals or alterations. From March 21 one month will be allowed for negotiations.—Mr. Walter Bell presided at the meeting, which was largely attended. The proceedings were conducted in private. At the close it was reported that the meeting had decided to make certain amendments on the proposed rules and regulations, which will be forwarded to the Employers' Association. With regard to the first clause of Rule 1, it was agreed to adopt it on condition that the provisions were faithfully carried out, and that the sentence "Only one stop for meals from November 1 to March 1" be deleted. Regarding the second clause, relating to overtime, it was decided to abide by the existing rule, which provides, "All time to be paid for at the rate of time and quarter up till 10 o'clock p.m. for the first five days of the week, and 5 p.m. on Saturdays; after these hours and till 6 a.m. double time to be paid." It was decided to reject entirely Rule 2. Rule 3 was agreed to, with the exception that a week, as hitherto, should be substituted for the proposed four days at the trades' holidays. Rule 4 was rejected, on the ground that the first portion of it appeared to destroy the existing rule as to country jobs. Rules 5 and 6 were agreed to. With regard to Rule 7, it was decided to reject it, and to abide by the existing rule, which reads as follows:—"The rules and regulations to take effect from March 14, and to remain in force until notice of alteration be given by the one party to the other. Such can only be given on or before January 15 in any year, alterations not to come into force until April 15 following." No objection was taken to the by-laws. One of the main points in dispute is as to the time the working rules and regulations should come into force. The masters propose that the time should be changed from April 15 to June 1. The operatives, it will be seen, prefer that it should remain as at April 15. The masters' contention is that it is fairer to enter into an agreement in the month of June than in April, a season of the year at which a temporary impetus is given to the trade in view of the fact that buildings, in many cases, must be completed for occupation at the Whitsunday term. In June, the masters contend, there is a better opportunity of considering what is likely to be the general state of the trade for the next twelve months.—*Scotsman.*

EMPLOYMENT IN THE BUILDING TRADES.—According to returns furnished by eighty-two Employers' Associations, whose members are estimated to employ about 94,000 workpeople, and by trade unions, with an aggregate membership of about 195,000, employment generally continues dull. Compared with a month ago it has slightly improved, but is worse than a year ago. The returns from Employers' Associations indicate, on the whole, that there was not much improvement in March, as compared with February, and that as compared with a year ago employment is worse. With bricklayers, employment is reported as dull; it is rather better than in February, but about the same as in the corresponding month of last year. With masons, employment was fair in England, but dull in Scotland and Ireland. With carpenters and joiners, employment was

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dull; it was rather better than in February, but worse than a year ago. The percentage of unemployed trade union carpenters and joiners at the end of March last was 6·7, compared with 6·9 at the end of February, and 3·4 in March, 1903. With plumbers, employment was dull in England and fair in Scotland. The percentage of unemployed trade union plumbers at the end of March was 9·2, compared with 9·3 at the end of February, and 7·5 a year ago. Employment with plasterers was bad in England, fair in Scotland, and dull in Ireland; with slaters and tilers it was dull; with painters it was generally dull in England and fair in Scotland, but on the whole was rather better than a month ago.—*Labour Gazette.*

Legal.

CASES UNDER THE LONDON BUILDING ACT, 1894:

DICKSEE *v.* PEARCE.

AT Lambeth Police Court on the 12th inst. Mr. T. Pearce, of 12, Whitecross-place, Finsbury, was summoned by Mr. Bernard Dicksee, District Surveyor for Newington and part of St. George's, Southwark, for commencing work at 43, Penton-place, without having previously given notice to the District Surveyor, as required by section 145.

The work in question was done under a notice from the Southwark Borough Council, acting under the Factory Act, 1901, in respect of underground bakehouses, and consisted of the lowering of the bakehouse floor 15 or 18 ins.; as the base of the walls was only a few inches below the level of the old floor, the excavation was carried down below the base of the walls which consequently had been underpinned; there was also a window opening enlarged.

Mr. Dicksee explained to the magistrate (Mr. Hopkins) that he had issued this summons particularly to draw attention to the fact that work could not be carried out under the order of the Local Authority without also complying with the requirements of the Building Act, which required all underpinning to be executed to the satisfaction of the District Surveyor; in this case the work had all been done and covered in some time before he discovered it on March 22.

The defendant pleaded that the work was done under the sanitary inspector, and he thought that was all that was necessary.

Mr. Hopkins found that notice should have been given, and (as Mr. Dicksee did not press for a heavy fine) ordered the defendant to pay 5s. and the cost of the summons.

DICKSEE *v.* GORE.

On the same day, W. Gore, of 126, Old Kent-road, was also summoned for neglect to give notice to the District Surveyor in respect of work done to the rear of 126, Old Kent-road, consisting of the erection of an irregular wooden wash-house containing a copper, the iron flue of which was in contact with the woodwork.

Mr. Hopkins fined defendant 10s. and costs.

DICKSEE *v.* NEAL.

On the same day, F. J. Neal, of 182, New Kent-road, was also summoned for neglect to give notice to the District Surveyor in respect of a new shop-front inserted at 66, Old Kent-Road.

Defendant, who pleaded that he had not given notice because the District Surveyor was not in when he called at his office, was informed by Mr. Hopkins that he could always give notice by means of a registered letter, and was fined 10s. and costs.

CLAIM AGAINST ARCHITECTS.

AT Bristol County Court recently a claim for 7*l.* was made by Messrs. Sheldon, Bush, and Co., lead merchants, against Messrs. La Trobe and Weston, architects, for goods supplied at the defendants' request. Mr. John Miller appeared for the plaintiffs, and Mr. Seymour Williams for the defendants. The case for the plaintiffs was that they received a request from the defendants to supply a speculative builder with material, the document stating that if the builder did not pay the defendants would give a certificate on the owners of the building. The account had not been met, and the defendants were accordingly sued. The defence was that in the ordinary course of business the architects offered, if the builder did not pay, to give a certificate so that the amount might be stopped out of the contract money. Mr. Williams observed that this was a common practice. The Judge: It is a very vicious one if it leads to this sort of trouble. Mr. Williams said that if the business was carried on upon strictly legal lines, there would be no business at all. The Judge: There would be no trouble. He held that the architects pledged their credit, and he gave judgment for the amount claimed. Mr. Williams said that as his Honour had found on the facts he had no remedy, but it was a most important point to architects. The Judge: Oh, nonsense. I don't suppose anyone ever gave such an order in these terms before. Mr. Williams: Oh, yes; it is a frequent occurrence. The Judge: Let Messrs. La Trobe and Weston give an order for a thousand pounds' worth of goods, and take the case to the High Court.—*Western Press.*

ACTION BY A SURVEYOR FOR FEES.

THE case of Klench *v.* Farris and others came before Mr. Justice Darling and a common jury in the King's Bench Division, on the 14th inst.—an action by the plaintiff, Mr. J. M. Klenck, a surveyor, carrying on business in Bishopsgate-street, E.C., against the defendants, Messrs. C. Farris and E. F. Fitch, churchwardens, and Messrs. A. W. H. Little and T. Freeman, overseers of the parish of St. Ethelburga, to recover 78*l.* 15s. for work done by the plaintiff, as surveyor, for and on behalf of the defendants. The defence was a denial of liability.

Mr. Lewis Thomas and Mr. R. Bankes appeared for the plaintiff, and Mr. Ernest Pollock for the defendants.

The plaintiff's case was that he had, before the year 1900, been engaged on many occasions by the overseers of the parish of St. Ethelburga in the valuation of property, etc. In 1900 there was a scheme to run tube railways through the parish of Bishopsgate, it being proposed that one of the lines should pass under the Church of St. Ethelburga. It was thought that the railway might injure the church and other buildings, and on December 6, 1900, a meeting of the Vestry was held, at which the defendants were present. At the meeting, a letter was read stating that it was proposed to call a meeting on behalf of the Ward of Bishopsgate to decide the question of opposing the bills for the railways in Parliament. It was then decided that the two churchwardens should attend that meeting, and the plaintiff's case was that he was instructed also to attend the meeting, as an expert, on behalf of the Vestry. The plaintiff attended the public meeting, when it was decided to start an organised opposition to the railway bills, and a committee of subscribers was formed. The plaintiff was one of the committee, and he attended the meetings of the committee. On December 12, 1901, he prepared a report, addressed to the churchwardens and overseers, and that report was read at a meeting of the Vestry. At that meeting, one of the members asked the plaintiff if he expected to be paid for his services, and the plaintiff replied that he did. No one suggested that he was not entitled to be paid. In April and July, 1902, the plaintiff sent in further reports, and in March, 1903, he sent in his account, but received a letter stating that it could not be entertained, as he had had no instructions to act for the parish.

In cross-examination, the plaintiff said he subscribed 5*l.* 5s. to the funds of the committee, and had attended frequently before the Board of Trade and the Parliamentary Committee. The committee, owing to lack of funds, ceased to exist in February, 1902. After this he still continued to act on behalf of the parish, and sent in two reports to the Vestry. About one half of his claim was for work done before the committee ceased to act, and the remainder for work done after February 3, 1902, when the committee ceased to exist.

At the conclusion of the plaintiff's case, Mr. Pollock submitted that the plaintiff had made out no case against the defendants. Upon the facts, he submitted that all the plaintiff was appointed to do was to represent the Vestry at the public meeting, and so far as he did any work, he did it as a voluntary member of the committee of subscribers. That committee had control of certain money, and it was his duty, as a member, to see that it was properly expended.

Mr. Thomas contended that the defendants were liable, and had been properly sued.

His lordship said he should take the opinion of the jury on the question of amount in case there was an appeal on the point of law. He accordingly asked the jury to say what amount the plaintiff was entitled to for work done down to February 3, 1902, and for work done after that date.

The jury found that the plaintiff was entitled to 25*l.* under each head.

His lordship then gave judgment for the defendants on the point of law, and granted a stay of execution in view of an appeal by the plaintiff.

BUILDER'S CLAIM UNDER THE WORKMEN'S COMPENSATION ACT.

IN the Court of Appeal, composed of Lords Justices Romer and Mathew, on the 18th inst., the case of Evans *v.* Cook and the Lancashire and Yorkshire Insurance Company (third parties) was heard on the application of the third party and the defendant Cook, for a stay of execution pending the hearing of an appeal from a decision of Mr. Justice Wills at the Nottingham Assizes.

Mr. Crawford, who appeared for the Insurance Company, said the action was brought by Evans against Cook to recover a sum of money which he (Evans) had paid to a workman who was injured in the course of his employment. Evans further claimed a declaration that Cook was liable to indemnify him in respect of any further sums which were payable to the workman. Cook brought in the Insurance Company by third party procedure, he having effected a policy of insurance with them. The facts were these: Evans, a builder, had contracted for the building of an infirmary at Nottingham, and he entered into a sub-contract with Cook to do the plastering work in connexion with the building. A workman employed by Cook was injured in the course of his employment, and the workman made a claim against Evans for compensation, Evans being the "undertaker," within the meaning of section 4 of the Workmen's Compensation Act. Evans, in his turn, claimed against Cook under an agreement which had been come to between the parties, whereby Cook was liable to indemnify Evans against any claim made under the Workmen's Compensation Act, 1897, or otherwise, for any accident which happened during the progress of the work. It did not seem that the claim by the workman went to arbitration, the evidence going to show that Evans admitted liability to the workman. Evans then brought an action in the King's Bench Division against Cook, who, in his turn, brought in the Insurance Company as third parties, under a clause in the policy of insurance he had effected with them. The only point was whether the Insurance Company were, in the circumstances, liable to pay compensation under the Act of 1897. The point taken by the Company was that as no actual proceedings had been taken against Evans, and Evans had never brought in Cook under the machinery of the Workmen's Compensation Act, the Company was not liable to indemnify Cook under this clause in the policy. Mr. Justice Wills decided the action in favour of Evans as against Cook, and in favour of Cook as against the Insurance Company. The Insurance Company were appealing, and they desired a stay of execution pending the appeal. In the event of this being granted, Cook also asked for a stay.

In the result, their lordships granted a general stay on the terms of the Insurance Company bringing into court the sums already paid by Evans to the workman, and further on their undertaking to pay the workman 15s. a week till the hearing of the appeal.

DAMAGE TO PROPERTY BY FLOODING.

THE hearing of the case of Benning *v.* the Ilford Gas Company concluded before Mr. Justice Grantham and a special jury in the King's Bench Division on the 18th inst.—an action by the plaintiff to recover from the defendants damages for injury done to his property by an alleged breach of a statutory duty and negligence of the defendants, and also by the defendants doing certain acts to the Aldersbrook, causing water to accumulate upon land, causing a nuisance. Defendants, in their defence, denied that they had been guilty of any nuisance, negligence, or breach of statutory rights.

Mr. Montague Shearman, K.C., and Mr. Crawford appeared for the plaintiff; and Mr. Lawson Walton, K.C., Mr. Duke, K.C., and Mr. Meyer for the defendants.

Mr. Shearman, in opening the case, said that the plaintiff owned property at Ilford, situate on land near the Aldersbrook. His complaint was that owing to the action and acts of the defendants, and the steps which they took, his land was flooded in June of last year, and his property damaged. The plaintiff said the acts of the defendants undoubtedly caused the damage to his property and caused the flood. The plaintiff went further, and said that the defendants could not justify what they did. His contention was that the defendants were bound to keep in repair a wall on the banks of the Aldersbrook constructed to protect the land from floods, and that in June of last year, owing to the defendants' acts, the wall gave way and the land was flooded, and plaintiff's property damaged. Running nearly parallel with the Aldersbrook was the river Roding. Some time since the defendants obtained parliamentary

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power to use certain of the land between the Roding and the Aldersbrook, and on the banks of the Aldersbrook for the purposes of their undertaking. These powers granted them the right to use the land of the Aldersbrook, provided they made a cutting to carry away water in flood time that formerly flowed from the Roding to the Aldersbrook. His case was that the defendants had used the bed of the Aldersbrook and had broken down the wall, so that when the floods of June last came the water came into the old bed of the Aldersbrook and through the breach in the wall that the defendants had made, and so on to the plaintiff's land. Defendants had failed to make the cutting they should have done, and this, he contended, was a breach of their statutory duties.

A great mass of evidence was called during the trial, and in the result the jury found, in answer to specific questions left to them, that the defendants, before the action, had created a nuisance, that the defendants had not exercised proper methods in stopping up the Aldersbrook, that defendants were not negligent in the mode of placing their mains, and that the flood in question was caused by the defendants not providing against it.

His lordship said this was a verdict for the plaintiff, and the case would be referred to the Official Referee for the assessment of the damages.

Order accordingly.

CONTRACTOR'S LIBEL ACTION.

THE hearing of the case of Lawrence and Thacker *v.* the *Wandsworth Borough News* Company, Ltd., and R. W. Simpson and Co., Ltd. concluded before Mr. Justice Ridley and a special jury in the King's Bench Division on the 19th inst, an action brought by the plaintiffs, a firm of contractors, against the defendants, the proprietors and printers of the *Wandsworth Borough News*, for damages for alleged libel contained in certain letters published in the defendants' newspaper. The defendants pleaded that in so far as the letters in question contained statements of fact, they were true in substance and in fact, and in so far as they consisted of expressions of opinion they were *bonâ fide* comments on matters of public interest.

It apeared that in May, 1901, plaintiffs contracted with the Wandsworth Borough Council to lay the channelling and kerbs in some new roads, the rest of the roadway being done by the Borough Council themselves. The plaintiffs had to lay a bed of concrete under the channel and under the kerb, and after that was done the Borough Council completed the road. The plaintiffs laid over 50,000 yards of concrete under kerbs and channels. Payments were made after inspection by the Borough Council's Surveyor, and upon his certificate plaintiffs received 5,700*l.* in 1901, 9,000*l.* in 1902, and 2,000*l.* in 1903. The plaintiffs, by their contract, had to maintain the work for six months and to rectify anything which went wrong. Complaints having been made as to the nature of the work, a committee appointed inspected the work and took the opinion of an expert. During that state of things, the defendants published three letters which accused the plaintiffs of scamping the work, and having robbed the ratepayers. The plaintiffs' case was that after they had laid the concrete, drain and gas pipes were put under it which interfered with their work, and although they were not bound to do so they re-did some of the work. Plaintiffs were afterwards paid 400*l.*, the balance of their claim, and the Council abandoned all claim for work badly done.

In the result the jury awarded the plaintiffs 250*l.* damages.

Judgment accordingly.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

6,828 of 1903.—W. ROBINSON: *Combined Hearth and Hot-plate or Fender for Fireplaces and Stoves.*

A fireplace, consisting in the combination of a solid or imperforate hearth, or of a hearth in the form of a grid or grate of iron and a hot-plate, or raised fender of aluminium, copper, brass, or other suitable metal or alloy of greater conductivity of heat than iron.

6,992 of 1903.—J. SOUTHERN, T. WINTRINGHAM, and S. H. WILLS: *Machinery and Apparatus for transporting and Piling Timber, and for like purposes.*

A transporter for deals or the like, comprising a track, fitted with power-rotated conveying rollers, such tract being made up of a number of independent sections, arranged contiguously, but supported upon portable trestles, one or more of the sections being fitted with rollers adapted to laterally divert and discharge the deals or the like.

7,503 of 1903.—A. L. MEYER: *A Manipulator for Window Sashes.*

A portable window-shade manipulator, comprising in combination with the wooden shade bar and shade fabric encoiling the same, a variable shade clamping means having shade bar and shade fabric gripping means, whereby the shade bar and shade fabric can be gripped to variable degrees.

8,993 of 1903.—S. COCHRANE and D. STANNARD: *Window Sash Fasteners.*

A window sash fastener, consisting in the combination of a plate having an inclined track provided with a socket or recess in a horizontal part thereof, said plate being arranged to be fixed to one meeting rail, with a pivoted bolt arranged in connexion with a plate on the other meeting rail, a vertical recess or bore in the knob end of said bolt, a spring-controlled catch located in said recess or bore, and arranged to have its nose project when in its locking position, and means for raising said spring-controlled catch out of locking engagement with the recess or socket in the first plate.

9,679 of 1903.—H. T. STEPHENS: *Catches for the Latches or Locks of Gates, Doors, and the like.*

A catch, consisting in the combination of a bracket adapted to be secured on a post, and two pivoted and counter-weighted tumblers in said bracket to receive and hold the latch or locking-bolt.

9,727 of 1903.—H. MAGNIN: *Apparatus for Cooling Apartments, Dwellings, and the like.*

An apparatus for cooling apartments, dwellings, and the like, by use of ice, comprising in combination an ice-container with a double wall, enclosing in its annular space an insulating substance, and at its bottom provided with apertures, such container being introduced in a removable way into a metallic circular tank so that its bottom comes to a higher level than that of the tank, and that the melted ice can flow out from said container into the circular tank, and cools its wall provided in its superior part with apertures allowing of the air to penetrate into said circular tank to get cool.

10,098 of 1903.—T. MOBUS: *Ram Piles.*

A ram pile, characterised in that the pile body of beton, cement, or the like is strengthened by inserted longitudinal rods, which are connected together by means of rails, cross-bolts, or the like, to a rigid skeleton for the purpose of vertically transmitting the strokes of the rammer on the pile-head, and of preventing the cracking or breaking of the pile-body.

10,366 of 1903. T. J. PALMER: *Apparatus for the Manufacture of Moulded or Embossed panels, and the like.*

The manufacture of moulded, or embossed, panels, or the like, by introducing to a pattern plate or plates, pulp containing an amount of liquid sufficient to allow the pulp to pass into the recesses in the pattern plate or plates, and then applying pressure in a device provided with means whereby the liquid is allowed to run off whilst the fibrous or solid matter of the pulp remains, and is formed into the required moulded, or embossed, panel, or the like.

11,649 of 1903.—E. A. CAROLAN (General Electric Company): *Lightning Arresters.*

A purality of lightning arresters, having a common ground connexion, each arrester comprising a series of conducting parts separated by spark gaps, consisting in the combination with a metallic connexion between an intermediate metallic part of one arrester, and corresponding metallic parts of the other arresters.

12,413 of 1903.—D. DAVIES: *An Apparatus for Automatically Opening and Closing Ventilators, Fanlights, Shutters, Window Sashes, and similar devices, on the outbreak of fire, and for other analogous purposes.*

An apparatus for automatically opening and closing of ventilators, fanlights, shutters, and similar devices, on the outbreak of fire, wherein the operation is controlled by a lever held in position by a cord or rope, capable of being severed by the action of fire, or otherwise, for the cutting off, or suppression of, air currents, or their creation or increase.

13,664 of 1903.—J. D. PRIOR: *Apparatus for Heating Buildings or Apartments.*

An apparatus for heating buildings or apartments, the said apparatus consisting essentially of a water-heater or boiler, which may be fitted in an ordinary or open-fronted fire grate, and connected with any kind of hot-water regulating system, the water-heater, or boiler, comprising a bottom horizontal tube, and a hollow boss or tube at some distance above the bottom horizontal tube, the bottom tube and boss, or two tubes, being connected by a series of flattened tubes, so shaped as to admit of their longitudinal expansion and contraction.

13,949 of 1903.—W. L. ROWLEY: *Drawer Pulls, Window Lifts, and the like.*

This invention consists of an improved drawer pull, or window lift, the front edge of which is formed into a circle or bead, the object being to strengthen the body of the article, to provide a better grip for the fingers, and to protect the fingers from the sharp edges which ordinary drawer pulls present. A piece of sheet metal of the required shape and thickness is taken, and the edge which is intended for the front edge of the drawer pull is formed into a circle, or bead, it is then stamped, or pressed, into a metal die of the required shape, and formed into a drawer pull having a circular or beaded front edge. The circular or beaded edge may lie entirely upon the inner or hollow side of the drawer pull, or upon the outer or rounded side, or it may lie between the two sides according to the shape of the said die.

16,691 of 1903.—F. WALTON: *A Method of Embossing and Colouring or Painting Lincrusta, or like material, and Apparatus therefor.*

A machine for painting lincrusta, or like embossed material, comprising one or more composition pattern rollers and metallic rollers, the said composition pattern rollers being embossed with the pattern taken from an embossing roller of an embossing machine, so arranged that as the lincrusta travels between the metallic composition pattern rollers, paints of different colours are imparted to different surfaces on the lincrusta.

16,693 of 1903.—F. WALTON: *A Method or Process of Painting or Colouring Lincrusta, or like material, and Apparatus therefor.*

A method for painting or colouring lincrusta, or like material, having a raised or embossed surface, which method consists in first causing the lincrusta to travel through paint to cut its entire face, after which the paint is adapted to be removed or wiped therefrom in different places so as to produce lincrusta in different colours or shades.

17,158 of 1903.—J. S. SLOGGETT: *Revolving Cowls for Chimneys and Ventilators.*

A cowl for chimneys and ventilating tubes, shafts, pipes, or roof ducts, consisting of a dome-shaped bonnet, having apertures made in it at suitable distances apart, the said apertures being so made that vanes are formed presenting wind areas to external and internal currents; the bonnet being adapted to rotate under the influence of such currents, about a fixed axis.

6,797 of 1903.—G. G. MARKS (The Brown Hoisting Machinery Co., Ltd.): *Grab or Hoisting Buckets.*

A grab and hoisting bucket, consisting in the combination of a suitable frame, bucket-jaws pivotally mounted on slidable pivot bearings in said frame, upright and lateral guides for said pivot bearings, arranged to give a predetermined sweep to said jaws, and means for operating said jaws in said frame.

12,344 of 1903.—F. H. SHORLANDS: *Fireplaces and Stoves for Hospitals, Schools, Dwelling-houses, and other places.*

A fireplace having an air-heating chamber at the back, consisting in forming the back and sides of the grate, in metal casting line with refractory material, arranged concave, or to curve outwards at the top from the air-chamber at the back.

19,591 of 1903.—C. REGAN: *A Slurry Grinder and Flint Extractor, Applicable to other purposes.*

A slurry grinder and flint extractor, comprising an outer pan, having an outlet or outlets; framework to support the said pan; a smaller perforated-bottomed pan within the outer one, and attached to a shaft passed vertically and axially through both of the said pans, and rotated by any suitable means; and stirrers attached to the framework or to the outer pan so as to hang within the inner pan.

2,603 of 1904.—A. H. SCHERZER: *Bascule Bridges.*

A bascule bridge, consisting of a span which is movably supported so that it may have a rising and falling movement, a motor mounted on the span by which power is given to move said span, and means driven by said motor and operating in connexion with non-supporting co-acting parts on the bridge approach, to give rising and falling movement to the span.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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3,432 of 1904.—P. M. JUSTICE (Pressed Prism Plate Glass Company): *Prismatic Glass Plates for Windows, Daylight Reflectors, Refractors, and the like.*

An illuminating structure having a plane transparent face upon one side, and obtuse angled prism elements on the other, one face of each prism arranged to deflect the principal light rays upon the said plane face at less than the critical angle, and the other prism face arranged to act as a totally reflecting face for the said deflected rays.

4,130 of 1904.—C. AHRENDTS: *Manufacture of Artificial Stones or Bricks in which the waste from the Leblanc or Ammonia Soda Process is used.*

A method of carrying out the process for making artificial stone or bricks with the addition of wet raw alkali waste from the Leblanc and ammonia soda manufacture, as described in Patent No. 16,307/00, characterised by the ingredients being thoroughly mixed, and the moulded blocks treated with dry heat before being hardened by means of steam.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 7.—By STEPHENSON & ALEXANDER (at Porth).

Porth, Glamorgan.—12 to 18 and 36 to 40, Glynfach-rd, u.t. 86 and 89 yrs., g.r. 21*l.* 9s. 8d., w.r. 179*l.* 8s. £2,000

Trealaw, Glamorgan.—120 and 121, Cemetery-rd., u.t. 93 yrs., g.r. 2*l.* 13s. 4d., y.r. 30*l.* 315

Dinas, Glamorgan.—25, 26, and 27, Belle Vue-st., y.r. 10*l.* 16s., also land adjoining, u.t. 69 yrs., g.r. 6*l.* 16s. 1d. 155

April 8.—By C. BRIDGER & SON (at Headley).

Headley, Hants.—Parish House-rd., Mount Pleasant Cottages (three) and 2 acres, f., w.r. 27*l.* 4s. 8d. 630

April 9.—By THORNBORROW & Co. (at Keswick).

Keswick, Cumberland.—Lake-rd., "The Lake Hotel," f., p. 3,710

Main-st., "Greenhow's Temperance Hotel," also s. and three cottages adjoining, f., p. 3,800

April 11.—By BLAKE & CARPENTER.

Thornton Heath.—97 to 119 (odd), Frant-rd., u.t. 99 yrs., g.r. 36*l.*, w.r. 296*l.* 8s. 2,215

Croydon.—Windmill-road, f.g.r. 8*l.* 10s., reversion in 53 yrs. 204

Norwood.—66 to 74 (even), Portland-pl. (s.) f., y.r. 215*l.* 3,110

Reigate, Surrey.—Evesham-rd., "Micklefield," f., y.r. 67*l.* 10s. 1,100

By FRANK JOLLY & Co.

Clapton.—61, Down-rd., f., e.r. 100*l.* 1,590

By A. ROBERTSON.

Haggerston.—169, Great Cambridge-st. (s.), f., y.r. 40*l.* 500

By MAPLE & Co. (at Newmarket).

Newmarket, Suffolk.—Snailwell-rd., "Zetland Lodge" (training establishment) and 8 a. 0 r. 19 p., f., p. 8,000

By NORMAN & SON (at Stratford).

Stratford.—23, Mathews Park-av., u.t. 85 yrs., g.r. 3*l.*, w.r. 36*l.* 8s. 310

Bow.—27, Lawrence-rd., u.t. 23½ yrs., g.r. 4*l.*, e.r. 32*l.* 325

April 12.—By BEARD & SON.

South Lambeth.—38 to 46 (even), Dawlish-st., f., w.r. 144*l.* 6s. 1,680

Bayswater.—13, Courtnell-st., u.t. 42 yrs., g.r. 6*l.* 6s., w.r. 57*l.* 4s. 365

By EDWARD SIMPSON.

New Cross.—114, Pepys-rd., u.t. 61 yrs., g.r. 6*l.* 6s., e.r. 45*l.* 515

By WALTON & LEE.

Piccadilly.—106, Jermyn-st. (s.), and 7, Apple Tree-yd., area 1,425 ft., f., p. 8,700

By CHINNOCK, GALSWORTHY, & Co.

Bayswater.—Queen's-gdns., f.g.r. 36*l.*, reversion in 49 yrs. 1,100

Twickenham. — Whitton-rd., f.g.r. 9*l.* 10s., reversion in 77 yrs. 255

Whitton-rd., f.g.r. 20*l.*, reversion in 86 yrs. . 485

Whitton-rd., freehold building estate, 5 a. 0 r. 34 p. 2,500

"Erncroft Farm," 28 a. 3 r. 38 p., f. 7,100

"Jubilee Farm," 62 a. 0 r. 23 p., f., y.r. 186*l.* 4,000

Isleworth.—Mogden-la., "Wiverlong Shot" (orchards), 23 a. 2 r. 28 p., f. 3,300

Kneller-rd., "The Old Manor House" and "Whitton Dean Farm," area 9 a. 1 r. 14 p., f., y.r. 155*l.* 7s. 2,750

By H. J. AUSTEN & SONS (at Burwash).

Burwash, Sussex.—"Pugshole Farm," 93 acres, f., p. 750

April 13.—By BAXTER, PAYNE, & LEPPER.

Sydenham.—Southend-la., "St. Margarets," f., p. 390

Bromley, Kent.—Elmfield-rd., "Hillfoot," u.t. 79½ yrs., g.r. 9*l.* 9s., p. 410

By H. DONALDSON & SON.

Stoke Newington.—3, Springdale-rd., u.t. 63 yrs., g.r. 6*l.* 4s. 6d., y.r. 40*l.* 440

2 and 4, Spenser-rd., u.t. 77 yrs., g.r. 13*l.*, w.r. 102*l.* 14s. 600

Tottenham.—56, Chester-rd., u.t. 97 yrs., g.r. 6*l.* 10s., w.r. 39*l.* 212

60, Etherley-rd., u.t. 74 yrs., g.r. 7*l.*, y.r. 26*l.* 245

By HILLYER & HILLYER.

Shepherd's Bush.—74, Godolphin-rd., f., e.r. 45*l.* 525

By G. E. LUCK.

Crouch End.—1, Crouch Hall-rd., u.t. 77½ yrs., g.r. 11*l.* 11s., e.r. 65*l.* 600

By W. G. SHADRAKE.

Plaistow.—103 to 115 (odd), The Broadway, f., w.r. 174*l.* 4s. £1,850

By J. A. TRYTHALL.

Tooting.—73 and 75, Trevelyan-rd., u.t. 74 yrs., g.r. 10*l.*, y.r. 52*l.* 300

By FOSTER & CRANFIELD.

Spitalfields.—3, Artillery-la. (s.), area 460 ft., y.r. 60*l.* 1,440

Hoxton.—21 to 45 (odd), Ivy-la., and 42 and 44, Ivy-st., u.t. 69½ yrs., g.r. 85*l.*, y.r. 374*l.* 8s. 1,535

Hackney.—281 to 287 (odd), 291, 303, 305, and 307, Wick-rd. (s.), and 2, Cowdry-st., with factory premises, u.t. 52 yrs., g.r. 50*l.*, y.r. 242*l.* 12s. 1,305

293 to 299 (odd), Wick-rd. (s.), u.t. 51½ yrs., g.r. 25*l.*, y.r. 115*l.* 14s. 450

2, Elsdale-st., y.r. 26*l.*, also i.g.r. 5*l.*, u.t. 43 yrs., g.r. 10*l.* 225

Tottenham.—106 to 112 (even), St. Ann's-rd. (s.), u.t. 70 yrs., g.r. 40*l.*, y.r. 156*l.* 1,000

By T. WOODS (at Isleworth).

Isleworth, Middlesex.—Talbot-rd., "Willow Cottage," f., e.r. 40*l.* 595

18 and 19, Percy-gdns., u.t. 51½ yrs., g.r. 5*l.*, w.r. 36*l.* 8s. 210

Worple-rd., eight plots of freehold building land 460

Percy-rd., nine plots of freehold building land 416

By BALLARD & MARSH (at Twickenham)

Hampton Hill, Middlesex. — Uxbridge-rd., "Fownhope," f., e.r. 80*l.* 1,070

By C. BRIDGER & SON (at Hindhead).

Hindhead, Surrey.—Portsmouth-rd., two freehold cottages and 1 a. 3 r. 12 p., p. 550

April 14.—By DAVID BURNETT & Co.

Pall Mall. — 7, Waterloo-pl. (offices), area 3,000 ft., u.t. 10½ yrs., g.r., etc., 815*l.*, e.r. 1,400*l.* 5,300

New Southgate.—Friern Barnet-la., a plot of freehold building land 1,000

By ROGERS BROS.

Peckham.—30 to 34, Garsdale-rd., u.t. 58½ yrs., g.r. 20*l.* w.r. 169*l.* 840

By SOUTHON & ROBINSON.

Cavendish-sq.—16 and 17, Prince's-st., area 2,500 ft., u.t. 72 yrs., g.r. 90*l.*, y.r. 600*l.* 10,000

Regent-st.—34, Mortimer-st., area 1,775 ft., u.t. 15½ yrs., g.r. 50*l.*, y.r. 200*l.* 1,400

Barbican.—44, Beech-st., area 610 ft., f., y.r. 140*l.* 2,550

By C. C. & T. MOORE.

Mile End.—31, Devonshire-st., u.t. 13½ yrs., g.r. 4*l.*, w.r. 32*l.* 10s. 100

Bethnal Green.—92 and 94, Barnet-gr., u.t. 18 yrs., g.r. 9*l.*, w.r. 75*l.* 8s. 295

58, Parmiter-st., u.t. 32 yrs., g.r. 3*l.* 3s., w.r. 36*l.* 8s. 245

Haggerston.—9, Trafalgar-rd., u.t. 35 yrs., g.r. 4*l.*, w.r. 40*l.* 6s. 225

80, Haggerston-rd., u.t. 35 yrs., g.r. nil, e.r. 32*l.* 290

Hackney.—12 and 14, Gloucester-rd., u.t. 42½ yrs., g.r. 7*l.* 10s., w.r. 72*l.* 16s. 520

By NEWBON, EDWARDS, & SHEPHARD.

Pentonville.—35, Claremont-sq., and 1 to 5, Claremont-mews, u.t. 8 yrs., g.r. 20*l.* 8s., y.r. 140*l.* 12s. 150

Holloway.—46, Medina-rd., u.t. 56½ yrs., g.r. 5*l.*, y.r. 32*l.* 370

Islington.—92, St. Paul-st., u.t. 32½ yrs., g.r. 6*l.*, y.r. 44*l.* 310

Dalston.—52, Brownlow-rd., u.t. 41½ yrs., g.r. 4*l.*, y.r. 32*l.* 285

Highbury.—173, 178, and 180, Highbury Newpk., u.t. 44½ yrs., g.r. 37*l.* 10s., y.r. 232*l.* .. 1,425

Tottenham.—1, 3, and 5, Braemar-rd. (s.), f., y.r. 96*l.* 1,270

Willesden.—Roundwood-rd., f.g.r. 20*l.*, reversion in 97 yrs. 460

Stamford-hill.—6, Holmdale-rd., u.t. 55 yrs., g.r. 10*l.*, e.r. 42*l.* 280

By STIMSON & SONS.

Clapham Common.—2, North Side, f., e.r. 100*l.* 1,300

Clapham.—57, Clapham Park-rd. (s.), f., e.r. 40*l.* 680

Pleasant-pl., f.g.r. 9*l.* 5s., reversion in 4 yrs. 430

Walworth.—85 and 87, Crampton-st., u.t. 40 yrs., g.r. 9*l.* 10s., y.r. 70*l.* 610

Peckham.—1, 3, 5, and 7, Naylor-rd. (s.), u.t. 56 yrs., g.r. 27*l.* 6s., y.r. 144*l.* 4s. 900

149 and 151, Commercial-rd., u.t. 36¾ yrs., g.r. 8*l.*, y.r. 72*l.* 540

15, Havil-st., f., w.r. 36*l.* 8s. 350

35, 37, and 39, Clifton-cres., u.t. 41 yrs., g.r. 16*l.* 10s., y.r. 92*l.* 685

41 to 51 (odd), Clifton-cres., u.t. 41 yrs., g.r. nil, w.r. 156*l.* 1,650

Pimlico.—126, Lillington-st., u.t. 22 yrs., g.r. 6*l.* 13s. 6d., y.r. 42*l.* 250

Dulwich.—91, Hindman's-rd. (s.), f., w.r. 39*l.* 420

Manor Park.—Herbert-rd., f.g.r. 31*l.* 10s., reversion in 91 yrs. 800

Stratford.—Major-rd., f.g.r. 25*l.* 10s., reversion in 79 yrs. 620

Dulwich.—Silvester-rd., f.g.r. 12*l.* 12s., reversion in 89 yrs. 305

By TOPLIS & HARDING.

Holloway.—39, Loraine-rd., f., e.r. 50*l.* 620

Canonbury.—27, Canonbury-pk. South, u.t. 32 yrs., g.r. 7*l.*, y.r. 50*l.* 335

By WM. WESTON.

St. John's Wood.—9, Barrow Hill-rd., u.t. 23½ yrs., g.r. 4*l.*, y.r. 40*l.* 325

April 15.—By LEOPOLD FARMER & SONS.

Camberwell.—73 to 91 (odd), Camberwell-rd. (s.), f., y.r. 1,180*l.* 20,100

St. John's Wood.—158, Alexandra-rd., u.t. 55 yrs., g.r. 14*l.*, e.r. 70*l.* 600

Hyde Park.—8, Lower Porchester-st. (s.), u.t. 17 yrs., g.r. 12*l.*, y.r. 110*l.* 825

Pimlico.—95, Charlwood-st. (s.), u.t. 27½ yrs., g.r. 8*l.* 10s., y.r. 80*l.* 750

Marylebone.—19, Earl-st. (s.), u.t. 11 yrs., g.r. 4*l.* 10s., q.r. 38*l.* 200

Maida Vale.—11, Park-pl.-villas, u.t. 33½ yrs., g.r. 10*l.*, e.r. 65*l.* £600

1, Howley-pl., u.t., 33½ yrs., g.r. 10*l.*, q.r. 65*l.* 600

2 and 4, Fulham-pl., u.t. 33½ yrs., g.r. 12*l.*, y.r. 115*l.* 1,050

Bayswater.—19 and 21, Monmouth-rd., u.t. 17 yrs., g.r. 7*l.* 10s., y.r. 120*l.* 800

By INMAN & CRIER.

Maida Vale.—130, Sutherland-av., u.t. 73½ yrs., g.r. 24*l.*, e.r. 110*l.* 525

By JONES, LANG, & Co.

Teddington.—High-st., "Otterham House" and 1½ acres, f., p. 3,000

Aldgate.—7, Church-row, u.t. 70½ yrs., g.r. 68*l.*, y.r. 175*l.* 870

By LESLIE, MARSH, & Co.

Kensington.—18, Kensington-cres., u.t. 17 yrs., g.r. 10*l.* 10s., y.r. 90*l.* 630

By MOSS & JAMESON.

Camden Town.—Hampshire-st., i.g.r. 17*l.*, u.t. 34½ yrs., g.r. nil 220

Kennington.—37, Royal-rd., u.t. 19½ yrs., g.r. 25*l.*, w.r. 41*l.* 12s. 155

Stepney.—Jamaica-st., i.g.r. 63*l.*, u.t. 5 yrs., g.r. 16*l.* 175

By NICHOLAS, DENYER, & Co.

Ringwood, Hants.—"Westmount" and 3 acres, f., p. 1,425

By WILTSHIRE & THURGOOD.

Lee.—52, Leyland-rd., u.t. 60 yrs., g.r. 12*l.*, e.r. 60*l.* 190

42 and 44, Leyland-rd., u.t. 60 yrs., g.r. nil, e.r. 130*l.* 540

Lewisham.—22, Longhurst-rd., u.t. 98 yrs., g.r. 6*l.*, w.r. 36*l.* 8s. 245

79, 85, 87, 89, 95, 117, and 119, Leahurst-rd., u.t. 96 yrs., g.r. 35*l.*, y.r. 255*l.* 12s. 1,890

45, Eastdown-pk., f., e.r. 50*l.* 690

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

TO CORRESPONDENTS.

S. S. P.—J. A. B.—D. S. (Amounts should have been stated).

J.B.—Too late; next week.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

MEETINGS.

FRIDAY, APRIL 22.

Architectural Association.—Mr. W. Gilbert on "Craftsmanship." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. P. Manby on "The Hygiene of Byres, Lairs, Cowsheds, and Slaughter-houses." 7 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. A. Trewby, B.A., on "No. 2 River-Pier of the Beckton Gasworks." 8 p.m.

SATURDAY, APRIL 23.

Architectural Association.—Visit to the New War Office Buildings, Whitehall. 2.30 p.m.

Royal Institution.—Mr. Cyril Davenport, F.S.A., on "Cameos." 3 p.m.

Incorporated Association of Municipal and County Engineers.—Eastern District Meeting at Great Grimsby.

Edinburgh Architectural Association.—Visit to Glasgow under the auspices of the Glasgow Architectural Association.

Sanitary Institute (Provincial Meeting at the Town Hall, Cardiff). — Discussion on "School Hygiene in connexion with the Duties and Responsibilities of the New Education Authorities," to be opened by Dr. E. Walford. The chair will be taken by Mr. W. Whitaker, Chairman of Council of the Institute. In the afternoon a visit will be made to the Isolation Hospital and Crematorium on Flat Holm Island.

Incorporated British Institute of Certified Carpenters.—Visit to Messrs. Walker & Co.'s Lead Works, Belvedere-road, S.E. 3 p.m.

MONDAY, APRIL 25.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. E. P. Manby on "The Laws, By-laws, and Regulations Affecting the Inspection and Sale of Meat and other Articles of Food, including their Preparation and Adulteration." 7 p.m.

Builders' Benevolent Institution.—Committee Meeting. 5 p.m.

Society of Arts (Cantor Lectures).—Prof. R. Langton Douglas, M.A., on "The Majolica and Glazed Earthenware of Tuscany." 4.30 p.m.

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TUESDAY, APRIL 26.

Society of Designers.—Mr. Starkie Gardner, F.S.A., on "Lead Architecture." 8 p.m.

Institution of Civil Engineers.—Annual General Meeting of Corporate Members only, to receive the Report of the Council, and to elect the Council and Auditors for the ensuing year. 8 p.m.

WEDNESDAY, APRIL 27.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Metropolitan Cattle Market, York-road, N. 2 p.m.

Southern Counties Federation.—Council Meeting, 3 p.m. Annual General Meeting, 3.30 p.m.

Institution of Civil Engineers.—Student's visit to the Metropolitan Railway Electric Power Station at Neasden. 2.30 p.m.

THURSDAY, APRIL 28.

Royal Institution.—Professor Dewar on "Dissociation," III. 5 p.m.

Institution of Electrical Engineers.—Mr. C. H. Merz and Mr. W. McLellan on "Power Station Design." 8 p.m.

Institution of Civil Engineers.—Students Visit to Walton and Hampton, to inspect the new Reservoirs Pumping-Station of the Southwark and Vauxhall Water Company. Train from Waterloo (South Station) at 10.20 a.m., to Hampton Court).

FRIDAY, APRIL 29.

Royal Institution.—Rev. J. A. Robinson, D.D., Dean of Westminster, on "Westminster Abbey in the Early Part of the Seventeenth Century." 9 p.m.

Junior Institution of Engineers.—Visit to the Cassland-road Higher Grade Board School, Wells-street, Hackney, to Inspect the Heating and Ventilating Systems. 6.30 p.m.

Institution of Civil Engineers.—Students Visit to the Works in progress at the new Thoroughfare between Holborn and the Strand, in course of construction. 11 a.m.

SATURDAY, APRIL 30.

Royal Institution.—Mr. Cyril Davenport, F.S.A., on "Jewellery," III. 3 p.m

Edinburgh Architectural Association (Associates' Section).—Visit to Roslin.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 10 0	,, ,, ,,
Flettons	1 10 0	,, at railway depôt.
Red Wire Cuts	1 13 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing	5 0 0	,, ,, ,,
Best Blue Pressed Staffordshire	4 4 0	,, ,, ,,
Do. Bullnose	4 10 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 8 0	,, ,, ,,
GLAZED BRICKS. Best White and Ivory Glazed Stretchers	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamferred, Squints	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers, and Header Quoins, Bullnose, and Flats	12 0 0	,, ,, ,,
	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamferred, Squints	14 0 0	,, ,, ,,
Second Quality, White and Dipped Salt Glazed	2 0 0	,, less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	30 0	per ton, ,,
Best Ground Blue Lias Lime	21 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	,, ,,
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	,, ,,
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	,, ,,

STONE.—(*continued*).

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer ,,	1 6	,, ,,
Greenshill ,,	1 10	,, ,,
Darley Dale in blocks	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 0	,, ,,
Red Mansfield ,,	2 4	,, ,,

YORK STONE—*Robin Hood Quality*

	s. d.	
Scappled random blocks	2 10	per ft. cube. ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. ,,
6 in. rubbed two sides ditto, ditto	2 6	,, ,,
3 in. sawn two sides slabs (random sizes)	0 11½	,, ,,
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	,, ,,
1½ in. to 2 in. ditto, ditto	0 6	,, ,,
HARD YORK— Scappled random blocks	3 0	per ft. cube ,,
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. ,,
6 in. rubbed two sides Ditto	3 0	,, ,,
3 in. sawn two sides (slabs random sizes)	1 2	,, ,,
2 in. self-faced random flags	0 5	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
,, ,, ,, 6 in. sawn both sides landings	2 7	deld. rly. depôt per ft. super.
,, ,, ,, 3 in. do.	1 2½	deld. rly. depôt ,, ,,

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 ,, ,,	13 17 6	,, ,,
20 × 10 best seconds ,,	12 15 0	,, ,,
20 × 12 ,, ,, ,,	13 10 0	,, ,,
16 × 8 ,, ,, ,,	7 0 0	,, ,,
20 × 10 best blue Portmadoc	12 12 6	,, ,,
16 × 8 best blue Portmadoc	6 12 6	,, ,,
20 × 10 best Eureka unfading green	15 17 6	,, ,,
20 × 12 ,, ,,	18 7 6	,, ,,
18 × 10 ,, ,,	13 5 0	,, ,,
16 × 8 ,, ,,	10 5 0	,, ,,
20 × 10 permanent green	11 12 6	,, ,,
18 × 10 ,, ,,	9 12 6	,, ,,
16 × 8 ,, ,,	6 12 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. ,, ,,
Best Brosely tiles	50 0	per 1000 ,, ,,
Do. Ornamental tiles	52 6	,, ,, ,,
Hip and Valley tiles	4 0	per doz. ,, ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 ,, ,,
Do. Ornamental do	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 0	,, ,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 ,, ,,
Do. Ornamental do	54 6	,, ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000 ,, ,,
Do. pressed	47 6	,, ,, ,,
Do. Ornamental do	50 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 6	,, ,, ,,

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOINERS' WOOD.

	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in	18 10 0	20 0 0
,, ,, 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0

WOOD.—(*continued*).

JOINERS' WOOD (*contd.*).	At per standard. £ s. d.	£ s. d.
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 10 0	15 10 0
,, ,, 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
,, ,, 3 in. by 9 in.	12 10 0	13 10 0
,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube	0 4 0	—

Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders, ordinary sections	8 2 6	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	7 5 0	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0	8 5 0
Staffordshire "Marked Bars"	10 0 0	—
Mild Steel Bars	8 15 0	9 5 0
Hoop Iron, basis price	9 5 0	9 10 0
,, ,, Galvanized	17 10 0	—
("And upwards, according to size and gauge.)		
Sheet Iron (Black)— Ordinary sizes to 20 g.	9 15 0	—
,, ,, 24 g.	10 15 0	—
,, ,, 26 g.	12 5 0	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	—
Ordinary sizes to 22 g. and 24 g.	13 5 0	—
,, ,, 26 g.	14 5 0	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	16 0 0	—
,, ,, 22 g. and 24 g.	16 10 0	—
,, ,, 26 g.	18 0 0	—
Galvanised Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0	—
,, ,, 22 g. and 24 g.	13 0 0	—
,, ,, 26 g.	13 15 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0	—
,, ,, ,, 26 g.	14 0 0	—
Cut nails, 3 in. to 6 in.	9 0 0	9 10

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lb. and up	15 0 0	—
Pipe in coils	15 10 0	—
Soil pipe	18 0 0	—
Compo pipe	18 0 0	—
ZINC—Sheet— Vieille Montagne ....ton	26 15 0	—
Silesian	26 10 0	—
COPPER— Strong Sheet....per lb.	0 0 10½	—
Thin ,, ,,	0 0 11½	—
Copper nails ,,	0 0 11	—
BRASS— Strong Sheet ,,	0 0 10	—
Thin ,, ,,	0 0 11	—
TIN—English Ingots ,,	0 1 4	—
SOLDER—Plumbers' ,,	0 0 6½	—
Tinmen's ,,	0 0 8	—
Blowpipe ,,	0 0 9	—

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ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft.	delivered.
,, fourths	1½d. ,,	,,
21 oz. thirds	3d. ,,	,,
,, fourths	2½d. ,,	,,
26 oz. thirds	3½d. ,,	,,
,, fourths	3d. ,,	,,
32 oz. thirds	4½d. ,,	,,
,, fourths	4d. ,,	,,
Fluted Sheet, 15 oz.	2½d. ,,	,,
,, 21 oz.	3½d. ,,	,,
⅛ Hartley's Rolled Plate	1½d. ,,	,,
¼ ,, ,, ,,	1½d. ,,	,,
½ ,, ,, ,,	2½d. ,,	,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 6
,, ,, ,, in drums	,,	0 1 9
Boiled ,, ,, in pipes or barrels	,,	0 1 9
,, ,, ,, in drums	,,	0 2 0
Turpentine, in barrels	,,	0 3 7
,, in drums	,,	0 3 9
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	,,	19 0 0
Best Linseed Oil Putty	per cwt.	0 7 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to J. MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ALDERSHOT.—For new works, offices, and stoker's flobby at Ash-road Gasworks, for the Aldershot Gas and Water Company. Mr. T. Davison, architect, 28, Great Ormond-street, W.C.:—

W. H. Pullinger	£2,442	Musselwhite & Sapp	£2,048
W. L. Edgoose	2,439	G. Kemp	1,843
Bateman & Son	2,342	Martin Wells & Co., Aldershot*	1,809

AYLESBURY.—For erecting additional offices at the County Hall, Aylesbury, for the Bucks County Council. Mr. R. J. Thomas, County Surveyor, County Hall, Aylesbury. Quantities by Mr. G. H. Blatherwick, Nottingham:—

W. H. Siarey	£2,560	G. Tombs & Son	£1,949
C. H. Hunt & Son	2,242	H. Flint	1,927
G. & T. Cannon	2,224	Webster & Cannon, Aylesbury*	1,898
S. Mayne & Son	2,140		
A. W. Nash	1,975		

BIGGLESWADE.—For waterworks, for the Water Board and the Urban and Rural District Councils. Mr. G. F. Deacon, engineer, 16, Great George-street, Westminster, S.W.:—

	Water Board.	Rural District Council.	Urban District Council.
	£ s. d.	£ s. d.	£ s. d.
J. Jackson	23,677 18 4	35,978 17 9	3,331 3 0
F. W. Trimm	20,967 0 0	37,572 0 0	4,756 0 0
Streeters & Todhunter	—	29,646 0 0	3,302 0 0
Easton, Courtney, & Darbishire	—	34,365 0 0	4,209 4 0
J. H. Vickers, Ltd.	21,055 6 3	—	—
H. Ashley	22,061 10 0	36,768 7 5	4,339 0 0
J. Jackson	22,964 11 7	35,363 4 10	3,670 5 3
Williams & Carnall	—	—	3,702 7 3
Greig & Matthews	29,754 15 4	49,644 10 0	8,639 2 10
J. W. Dean, Ltd.	21,832 0 0	29,233 0 0	3,474 0 0
Wilkinson Bros.	19,824 0 0	31,357 0 0	3,591 0 0
G. Lawson	24,599 8 0	41,698 15 8	5,366 1 6
S. Redhouse, sen.	20,275 0 0	28,665 0 0	3,312 0 0
J. Hodson & Son, Nottingham*	21,496 9 5	31,044 18 10	3,542 4 3
C. Chamberlain	21,844 0 0	—	3,760 0 0
Bennie & Thompson	21,564 0 11	29,108 15 5	3,475 3 6
J. Moffat	22,375 19 3	32,749 1 5	4,028 8 0
J. Riley	23,682 17 11	33,295 0 0	4,005 3 0
Rowell & Sons	—	31,485 18 0	3,940 5 0

BEXHILL (Sussex).—For the constructon of a storage tank, power-house, and drainage works in Peartree-road, Little Common, for the Corporation. Mr. G. Ball, Borough Surveyor, Town Hall, Bexhill:—

T. Adams	£550 0 3	Peerless, Dennis, & Co.	£427 10 0
M. Hookham	532 12 0	S. Carey*	395 0 0
Padgham & Hutchinson	520 0 0	J. Harvey	341 0 0
J. Martin	431 0 0		

[Borough Surveyor's estimate, £400.]

BRISTOL.—For the erection of Moorfields School, St. George, for the Education Committee. Messrs. La Trobe & Weston, architects, 23, Clare-street, Bristol:—

H. A. Forse & Son	£6,055	E. Clark	£5,260
E. Walters & Son	5,740	E. Love	5,235
R. Wilkins & Son	5,669	J. Olsen & Son, Brislington*	4,963
W. Cowlin & Son	5,439		

Plumbing: Slade & Bridgman* £440

BRISTOL.—For the erection of schools, etc., Air Balloon-hill, St. George, for the Education Committee. Messrs. La Trobe & Weston, architects, 20, Clare-street, Bristol:—

W. & J. Bennett	£13,450	E. Walters	£12,070
H. A. Forse & Son	12,895	E. Love	12,035
G. Humphreys & Son	12,890	E. Clarke, Fishponds*	11,337
R. Wilkins & Son	12,549		

Plumbing: A. E. Wilkins* £1,106 1 6

BURNLEY.—For construction of a covered reservoir in Crow Holes Wood, Cliviger, for the Rural District Council. Mr. S. Edmondson, Surveyor, 18, Nicholas-street, Burnley:—

G. Callender & Co.	£4,310 12 6	Mullen & Dusken	£2,666 18 0
E. Walker	4,280 1 3	W. Sutcliffe	2,628 2 5
T. Dent & Sons	3,744 2 2	J. Miles	2,581 14 4
J. S. Dawson	3,248 17 8	Smith Bros.	2,570 11 4
H. Prescott & Co.	3,242 1 7	Clegg Bros.	2,401 0 0
J. Wilson & Sons	3,047 12 9	J. R. Atkinson, Colne*	2,380 0 0
T. & J. Foster	2,926 10 2	J. G. Rutter & Sons	2,304 11 8
J. & G. Duxbury	2,716 5 0	P. O. Malid (pipe line only)	622 5 11

BURNLEY.—For 6,700 yds. of cast-iron socket and spigot pipes, for the Rural District Council. Mr. S. Edmondson, Surveyor, 18, Nicholas-street, Burnley:—

	Per ton.		Per ton.
J. Dakes & Co.	£5 15 0	J. & R. Ritchie, Ltd.	£4 18 6
E. W. & H. Haley	5 10 0	Sheepbridge Iron Co.	4 18 0
Cochrane & Co.	5 9 0	J. Lees & Sons	4 17 6
MacSwan & Co.	5 8 6	Clay Cross Co.	4 16 8
J. & S. Roberts	5 5 0	Stanton Ironworks Co.	4 15 0
A. J. Cloake	5 4 0	Staveley Iron Co. nr. Chesterfield*	4 15 0
Holwell Iron Co.	5 3 6		
Watson, Gow, & Co.	5 0 0		

CARDIFF.—For erecting a smith's shop and chimney stack at Trade-street Public Works Depot, for the Corporation. Mr. W. Harpur, Borough Engineer. Quantities by Tenderer:—

W. T. Morgan, Builder, Cardiff* £230

CEFN.—For cemetery extension works (Contract No. 2: Bridge, roads, etc.), for the Merthyr Tydfil Urban District Council. Mr. T. Fletcher Harvey, C.E., Town Hall, Merthyr Tydfil:—

Jones & Davies	£5,212 12 8	J. Sutherland	£3,974 1 0
D. P. Davies	5,132 14 10	W. Brown, Merthyr*	3,853 5 1
E. Jones	4,989 4 0		
Evans & Owen	4,771 17 7		

DALTON.—For erecting new stores at Dalton Brook, near Rotherham, for the Masborough Equitable Pioneers' Society, Ltd. Mr. H. L. Tacon, architect, 11, Westgate, Rotherham. Quantities by architect:—

Dennis, Gill & Son	£1,407 0 0	I. W. Bygate	£1,298 2 8
T. Gray & Sons	1,405 0 0	G. Saul	1,285 0 0
J. Tradewell	1,380 10 0	W. Earnshaw	1,273 14 2
Thornton & Son	1,366 0 0	W. Treherne	1,242 0 0
Rt. Snell	1,366 0 0	F. T. Salmon & Co.	1,235 0 0
Chadwick & Co.	1,316 0 0	W. Bell	1,200 0 0
Rd. Snell	1,309 0 0	J. Cooper, Rawmarsh-rd., Rotherham*	1,187 0 0
G. E. Bates	1,302 7 0		

Separate Trades.

Joiners' Work: J. Tradewell, Rawmarsh .. £323 10 0
Plumbers' Work: J. Gibbons, Masborough .. 65 12 8
Plumbers' Work: Snowden & Son, Barnsley 62 0 0
Painters' Work: Snowden & Son, Barnsley 24 10 0

DROGHEDA.—For erecting a public library, for the Public Library Committee. Mr. F. H. Tallan, architect, 35B, Kildare-street, Dublin:—

J. P. Pile	£2,850	S. Roche	£2,050
T. W. Scott	2,830	P. McCann	1,945
T. A. Mellon	2,650	F. Gogarty, Drogheda*	1,925
T. Creaser	2,180		

ELGIN.—Accepted for new drapery warehouse, Elgin, N.B. Mr. R. B. Pratt, architect, Elgin:—

Mason: Jamieson, Elgin .....
Carpenter: J. & A. Robb, Rothes ....
Plumber: J. Gordon & Son, Elgin ....
Slater: A. Davidson & Son, Elgin £2,215
Plasterer: G. Gray, Elgin.....
Painter: W. Fordyce, Elgin.....
Iron Work: J. Johnston & Son, Elgin

GILWERN.—For erecting a rectory house, Gilwern, near Abergavenny, for Rev. G. Roberts. Mr. F. Baldwin, architect, Abergavenny. Quantities by the architect:—

J. T. Morgan & Son	£2,486 0 0	Leadbeter Bros.	£2,829 0 0
J. G. Thomas & Sons	2,480 0 0	J. E. Williams	2,280 0 0
T. S. Foster	2,390 0 0	Rees Edwards, Tredegar†	2,274 10 0
C. Cooke	2,360 0 0		

[† Reduced, through a modification, to 2,259*l.* 10s., and accepted.]

GRAVELLY HILL.—For heating and hot-water apparatus to No. 4 infirmary block at workhouse, Gravelly Hill, Birmingham, for the Guardians of Aston Union. Messrs. C. Whitwell & Son, architects, 23, Temple-row, Birmingham:—

A. J. Kallaway, Hurst-street, Birmingham £487 17 0

HANLEY.—For 380 yds. of 9-in. drain pipes and laying, for the Hanley, Stoke, and Fenton Joint Hospital Board. Mr. Elijah Jones, architect, Albion-street, Hanley. Quantities by architect:—

Langley & Co.	£279 13 6	A. F. Brown	£240 14 6
J. Edwards	265 15 8	J. Bagnall	238 0 0
L. Price	262 0 0	C. Cornes & Sons	215 0 0
P. H. Bennion	256 0 0	W. Williams, Etruria*	214 10 0
T. Godwin	245 0 0		
F. Barke	240 15 0		

HARROW.—For erecting stables, carteheds, etc., at depot, Bassborough-road, for Harrow-on-the-Hill Urban District Council. Mr. J. Percy Bennetts, Engineer and Surveyor to Council:—

J. Smith	£798 8 6	C. Simmons	£681 0 0
Collins & Lea	724 18 6	G. L. Bull, Harrow*	647 0 0
Clifford & Cough	689 0 0		

IPSWICH.—For re-building public house at Ipswich, for Messrs. Steward & Patteson, Ltd. Messrs. Morgan & Buckingham, architects, 3, Redwell-street, Norwich. Quantities by architects:—

E. Catchpole	£1,225	W. Grayston	£1,218
F. Bennett	1,220	C. Borrett*	1,195

[All of Ipswich.]

ISLEWORTH.—For repairs and additions to Percy House, Mill Plat, for the Guardians of Brentford Union. Mr. W. H. Ward, architect, Paradise-street, Birmingham:—

J. Dovey & Co., Ltd.	£603 0 0
Chambers Bros., Ealing*	574 0 0
G. Chesswas	431 10 0

JARROW.—For street works (back street, Cuthbert-terrace, High-street, and back street between Coquet and Wansbeck-streets), for the Urban District Council. Mr. J. Petree, Borough Surveyor, Acca House, Grant-street, Jarrow:—

Simpson	£221 3 7	T. Callaghan, Jarrow*	£170 3 0
Kennedy	198 0 0		
Thornton	181 0 3		

LEAVESDEN (Herts).—For internal and external painting and cleaning at Leavesden Asylum, near Watford, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer to the Board:—

W. Riley	£1,750 0 0	E. Proctor & Son	£913 0 0
J. L. Tyler	1,640 0 0	W. Dudley	754 0 0
T. Carr	1,500 0 0	M. Batchelor	720 10 0
G. Wiggs	1,398 0 0	A. H. Inns, Watford*	584 0 0
Vigor & Co.	1,315 0 0		
J. J. Richards	1,006 0 0		

LEEDS.—Accepted for New Receiving Wards, for Leeds Union. Messrs. Thomas Winn & Sons, architects and surveyors, Cavendish-chambers, 92, Albion-street, Leeds:—

Bricklayer and Mason: W. Thompson & Sons, Leeds	£3,350 0 0
Carpenter and Joiner: H. Atkinson & Sons, Leeds	1,032 0 0
Ironfounder: L. Cooper, Leeds	239 13 4
Plumber and Glazier: J. Lindley, Leeds	445 0 0
Concreter: S. McFarlane, Leeds	371 15 0
Slaters: J. Atkinson & Son, Leeds	140 0 0
Tilers: Pilkington's Tile Co., Clifton, nr. Manchester	888 5 0
Plasterer: J. Dobson, Leeds	287 0 0
Painter: J. Butler, Leeds	108 0 0
Wood Block Flooring: (In abeyance)	—
Heating: (In abeyance)	—

LEEDS.—Accepted for infirmary wards (Block A), for Leeds Union. Messrs. Thomas Winn & Sons, architects and surveyors, Cavendish-chambers, 92, Albion-street, Leeds:—

Bricklayer and Mason: W. Thompson & Sons, Leeds	£6,150 0 0
Carpenter and Joiner: Craven & Umpleby, Leeds	5,995 0 0
Plumber and Glazier: J. Lindley, Leeds	1,570 0 0
Concreter: S. McFarlane, Leeds	998 0 0
Ironfounder: D. Powner, Leeds	746 12 8
Slaters: J. Atkinson & Son, Leeds	399 5 0
Tilers: Pilkington's Tile Co., Clifton, near Manchester	2,507 0 0
Painter: W. Grisdale, Leeds	415 0 0
Plasterer: J. Dobson, Leeds	1,595 4 0
Heating: (In abeyance)	—

TENDERS—*Continued on page 453.*

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Scavenging, Haughton-le-Skerne	Darlington R.D.C.	J. Robinson, Union Offices, Darlington	April 23
Street Works	Manchester Corporation	Paving, etc., Department (Surv. Office), Town Hall, Manchester	April 25
Alterations, etc., Droxford Police Station and Court	Southampton County Council	W. J. Taylor, County Surveyor, The Castle, Winchester	do.
1,000 Tons Tramway Rails, etc.	Public Works Com., Birmingham	J. Price, City Surveyor, Council House, Birmingham	do.
Tar-paving Playgrounds at Sandringham-road School	East Ham Education Committee	R. L. Curtis, Architect, 120, London-wall, Moorgate-street, E.C.	do.
Demolition of Old Buildings, High-street North	East Ham U.D.C.	A. H. Campbell, M.Inst.C.E., Town Hall, East Ham, E.	do.
Retort House, etc.	Renfrew Town Council	Engineer, Municipal Buildings, Renfrew	do.
Materials and Carting	Glasgow Corporation	W. A. Chamen, Engineer, 75, Waterloo-street, Glasgow	do.
Private Improvement Works at Swinton-terrace	Halifax Highways Committee	J. Lord, Borough Engineer, Town Hall, Halifax	do.
Materials	Glasgow Corporation	D. M'Coll, City-chambers, 64, Cochrane-street, Glasgow	do.
*Widening and Surface Draining of Scott's-lane	Beckenham U.D.C.	Council's Surveyor, Beckenham	do.
Piling, etc., New Southern Outfall	Bridlington Sanitary Committee	E. R. Matthews, Borough Surveyor, Town Hall, Bridlington	April 26
Five Pairs and Two Single Cottages, Glencullen	Rathdown No. 1 R.D.C.	P. Cunnian, Clerk, Loughlinstown, Ireland	do.
Macadam Road, etc., N. Park-grove, Roundhay	Leeds Corporation	City Engineer's Office, Municipal Buildings, Leeds	do.
Materials, Electricity Department	Govan Town Council	T. C. Parsons, Burgh Electrical Engineer, Helen-street, Govan	do.
Painting, etc., Mills, Offices, Cottages, and Stables	Sowerby Bridge Flour Society	Manager, Walton-street, Sowerby Bridge	do.
Painting and Decorating Board Room and Offices	do.	do.	do.
Sewage Disposal Works, etc.	Bowdon U.D.C.	J. Newton, Son, & Bayley, Engineers, 17, Cooper-st., Manchester	do.
Deck Bridges	Secretary of State for India	Director General of Stores, India Office, Whitehall, S.W.	do.
Carriage Underframes and Body Ironwork	do.	do.	do.
Cast-Iron Pipes	Derwent Valley Water Board	E. Sandeman, Engineer's Office, Bamford, via Sheffield	do.
Stripp. & Reslat. 22 Houses, Jesmond av., Man'ham	.....	G. C. Gamble, Architect, Ilkley	do.
Additions to Trafalgar Inn, Dartmouth	Mrs. M. Walls	E. H. Back, Architect and Surveyor, Dartmouth	do.
Street Works, Albert-street, Church street, etc.	Droylsden U.D.C.	C. Hall, Surveyor, 10, Ashton-road, Droylsden	April 27
Rec'nstruct'n, Golden Hillock-rd. Bridge, Small Heath	Public Works Com'tee., Birmingham	J. Price, City Surveyor, Council House, Birmingham	do.
Steam Rolling Roads	South Stoneham R.D.C.	E. T. Westlake, Clerk, 20, Portland-street, Southampton	do.
Carting Gravel and Flints	do.	do.	do.
Flints	do.	W. J. Potter, District Surveyor, "Glenroy," Swaythling	do.
Residence and Outbuildings at Cusop, Hay	.....	R. T. Griffiths, Hay	do.
Rails	Gt. Southern & Western Ry.(Ireland)	Engineer, Inchicore, Dublin	do.
Steel Bull-headed Rails	East India Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Carting Materials	Cannock R.D.C.	H. M. Whitehead, Surveyor's Office, Penkridge, Stafford	do.
Getting and Boating Slag	do.	do.	do.
Siphon under the New River, Bounds Green-road	Wood Green U.D.C.	C. J. Gunyon, Engineer to Council, Town Hall, Wood Green	do.
Double-Cylinder Water Ballast Horse Roller	do.	do.	do.
Disinfectants	do.	A. E. Adams, Sanitary Inspector, Town Hall, Wood Green	do.
Limestone, Granite, and Tar Macadam	Ilkley U.D.C.	The Surveyor, Council Offices, Ilkley	do.
Works to Labourers' Cottages in Tallaget, etc.	S. Dublin R.D.C.	T. J. Bryce, Clerk and Surveyor to Council, 1, James's-st., Dublin	do.
Buildings at Gasworks, Thompson-street	Stockton-on-Tees Corporation	Manager's Office, Gasworks, Stockton-on-Tees	do.
5,728 Creosoted Sleepers, Chat Moss, etc.	Manchester Cleansing Committee	R. Williamson, Town Hall, Manchester	do.
Antfall Sewer, etc., Morton-street, Portobello	Edinburgh City Council	Burgh Engineer, City-chambers, Edinburgh	April 28
Catholic Hall, Carrickmacross	Rev. A. Maguire	Parochial House, Carrickmacross, Co. Monaghan	do.
Hotel, Bradfield, Essex	Messrs. Steward & Patteson	J. W. Start, Architect and Surveyor, Colchester	do.
Station Buildings, Donegal to Ballyshannon	Donegal Railway Co.	A. Mc. C. Stewart, Engineer, 5, Castle-street, Londonderry	do.
Electrical Plant, Longdendale	Manchester Waterworks Committee	Secretary, Waterworks Office, Town Hall, Manchester	do.
Paving, etc.	Dewsbury Corporation	Borough Surveyor's Office, Town Hall, Dewsbury	do.
Fireclay Retorts, Bricks, etc.	Belfast Gas Committee	At the Gasworks	do.
Paving Streets	Gateshead Corporation	J. Bower, Borough Engineer, Town Hall, Gateshead	do.
Flagging, Draining, etc., Philips-park	Manchester Parks Committee	City Architect, Town Hall, Manchester	do.
Terracing Boys' Playgr'd & Flagging, etc., Queen's-pk.	do.	do.	do.
Rebuilding Quarry Arms, Aberbargoed	.....	G. Kenshole, Architect, Station-road, Bargoed	do.
Laying Concrete Floors at Cattle Market	Bristol Cattle Market Trustees	P. Addie, Council House, Bristol	do.
Jobbing Work (Police Department)	Glasgow Corporation	Office of Public Works, City Chambers, 64, Cochrane-st., Glasgow	do.
Granolithic Paving of Footways, Portobello	Edinburgh Roads Department	Mr. Proudfoot, City-road Surveyor, City Chambers, Glasgow	do.
Granolithic Paving in City	do.	do.	do.
*Public Underground Convenience	Hackney Borough Council	Borough Engineer, Town Hall, Hackney, N.E.	do.
*Supply of Timber	Ordnance Survey	Ordnance Survey Office, Southampton	do.
Basement, Municipal Buildings, Market-street	Leigh Corporation	J. C. Prestwich, Architect, Bradshawgate-chambers, Leigh	April 29
Four Houses, Manor Royal Estate, Halifax	.....	R. Horsfall & Son, Architects, 22a, Commercial-street, Halifax	do.
Tar	Denton U.D.C.	J. C. Smith, Gas Engineer, Denton, near Manchester	do.
Making-up of Goring-road, Steyning, Sussex	.....	F. Slaughter, Council Offices, New Shoreham	do.
Chapel and Classrooms, Victoria-street, Rashcliffe	.....	B. Stocks, Architect, St. Peter's-street, Huddersfield	do.
Whinstone and Slag	Thirsk R.D.C.	C. McC. Swarbreck, Clerk, Thirsk	do.
Wrightwork Fittings, Anderston Free Library	Glasgow Corporation	Stewart & Paterson, Architects, 14, Blythswood-square, Glasgow	do.
*Coastguard Station at Robin Hood's Bay, Yorkshire	Admiralty	Works Department, Admiralty, 21, Northumberland-avenue, W.C.	do.
*Coastguard Station at Whitby, Yorkshire	do.	do.	do.
Branch Shop, Stoke-road, Slough	Co-operative Society, Ltd.	W. T. Whalley, Secretary, Society Office, 190, High-street, Slough	April 30
Four Shelter Seats on Sea Front	Deal U.D.C.	T. C. Golder, Borough Surveyor, 23, Queen-street, Deal	do.
Schools, Calton-road, Gloucester	Gloucester Education Committee	W. B. Wood, Architect, 12, Queen-street, Gloucester	do.
Water Tower, Ringsfield Pumping Station, Beccles	Waterworks Co.	Waterworks Office, Exchange-square, Beccles	do.
500 yds. of 3-in. C.I. Water Mains	Maldon Borough Council	T. R. Swales, Borough Engineer, Municipal Offices, Malden	do.
Two Houses, Graigwen-road, Pontypridd	.....	A. O. Evans, Architect, Pontypridd	do.
Stores (Water Department)	Glasgow Corporation	J. R. Sutherland, Water Engineer, 45, John-street, Glasgow	do.
Alterations, etc., Rowilly-road Infants' School	Barry U.D.C.	G. A. Birkenhead, Architect, Caledonian-chambers, Cardiff	May 2
Two Houses, Park-road, Cwmpare, near Treorchy	Messrs. Jones & Thickens	D. Jones, 231, Park-road, Cwmpare	do.
Sixteen Houses, Park-road, Cwmpare	Park-road Building Club	Park Hotel, Cwmpare	do.
Reb'ld'g Hotel de Ville, etc., Inf'y, etc., King-st., Leeds	.....	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Bl'ck'sh'ps & Offi. Premises, Land's-la. to Albion-pl.	.....	do.	do.
Making-up Cambridge-road	Frinton-on-Sea U.D.C.	E. M. Bate, Surveyor, Council Offices, Frinton-on-Sea, Essex	do.
Sewering and Making-up Roads	do.	do.	do.
Construction of Sewers, Raglan-road and Oxford-road	do.	do.	do.
Class-rooms and Hall, Sedbergh School	The Governors	Wright & Son, Surveyors, Lancaster	do.
Timber	Lewisham Guardians	Union Offices, 286, High-street, Lewisham, S.E.	do.
600 Tons of Granite	Loughton U.D.C.	District Surveyor to Council, Loughton, Essex	do.
Tar Paving	do.	do.	do.
5,000 Tons of Granite	Newmarket R.D.C.	S. J. Ennion, Clerk, Newmarket	do.
Materials, Team Labour, and Steam Rolling	Billericay R.D.C.	F. E. Ennals, Surveyor, Brentwood	do.
Painting, etc., Hospital, Heswall	W. Derby & Foxteth-pk. Hos. Com.	C. H. Lancaster, Arch., Brougham-ter., W. Derby-rd., Liverpool	do.
*Erection of Workshops and Stores, Neepsend	Sheffield United Gas Light Co.	Company's Engineer, Commercial-street, Sheffield	do.
*General Stores	S. India Railway Company	H. W. Notman, 55, Gracechurch-street, London, E.C.	May 3
*Locomotive Stores	do.	do.	do.
*Roofing	do.	do.	do.
*Carting Broken Granite	Steyning West R.D.C.	E. Cripps, Council Offices, New Shoreham	do.
*Tiles, etc.	Southern Mahratta Railway Co.	E. G. Thornton, Sec., 46, Queen Anne's-gate, Westminster, S.W.	do.
*Road Materials	Uckfield U.D.C.	C. Dawson, Clerk, Uckfield	do.
Timber Groyne	Dover Town Council	H. E. Stilgoe, Borough Engineer, Town Hall, Dover	do.
Shop Fittings, St. Leonard's-road, Windsor	Co-operative Society	S. M. Wyborn, Architect, Park-chambers, Sheel-street, Windsor	do.
Open-air Sea-water Bath, Carnarvon	The Corporation	E. Hall, Borough Engineer's Office, Guildhall, Carnarvon	do.
Road Materials	King's Lynn Corporation	H. J. Weaver, Borough Surveyor, King's Lynn	do.
*New Post Office, Woodford Green	Commissioners of H.M. Works, etc.	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	do.
*Road Materials	Borough of Bromley	Borough Engineer, Municipal Offices, Bromley, Kent	do.
Roofs, Limerick Terminus	Gt. South'n & Western Ry., Ireland	Engineer, Inchicore, Dublin	May 4

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Underground Convenience	Blackpool Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	May 4
Aboveground Convenience	do.	do.	do.
Stores, Stables, and Cottage, Pear Tree Estate	Heston and Isleworth U.D.C.	P. G. Parkman, Engineer and Surveyor, Town Hall, Hounslow	do.
*Repairs to Chimney Stacks, Leavesden Asylum	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	do.
Covered Service Reservoir, Gorset Hill	Southport Water Board	H. Rolfe & Son, Engineers, 8, Victoria-street, Westminster	do.
*P'viding & Sett. about 1,800 ft. Norwegian Gran., etc. Materials	Wanstead U.D.C.	Council Offices, Wanstead, N.E.	do.
*Five Sets of Rollers	Andover R.D.C.	J. Wormald, District Surveyor, Andover	May 5
Gasholder, Broadstairs	Borough of Camberwell	Borough Engineer, Town Hall, Camberwell, S.E.	do.
Additions, etc., Ruthin County School for Girls	Ash-next-Sandwich Gas Co.	F. Higginson, Engineer, Gas Office, Alexandra-road, Broadstairs	May 6
Condensing Plant, Electricity Department	The Governors	E. Roberts, Clerk, Record-street, Ruthin	May 7
Rebuilding Miner's Arms, Craig-y-Tewgoed, Cwmavon	Wallasey U.D.C.	J. A. Crowther, Engineer, Seaview-road, Liscard, Cheshire	do.
Carburetted Water Gas Instal'n, Granton Gas Works	E. E. Bevan	J. Book Rees, Architect, Neath	do.
Mortuary, River-lane, Thames-st.	Edinburgh and Leith Gas Commrs.	W. R. Herring, Engineer and Manager	May 9
Electricity Works Plant	Prop. Com., Kingst'n-'-Th'mes Corp	Borough Surveyor, Kingston-on-Thames	do.
Making-up Wright-road, etc.	Dublin Lighting Committee	Spencer Harty, City Engineer, City Hall, Dublin	do.
Two Filter Beds, etc., St. Clement, Cornwall	Chelmsford R.D.C.	H. G. Warne, Surveyor, Avenue-chambers, Chelmsford	do.
*Carnegie Free Library	Truro Water Co.	J. Mansergh & Sons, Engineers, 5, Victoria-street, Westminster	do.
*Roadmaking and Paving Works	Southall-Norwood U.D.C.	Reginald Brown, A.M.I.C.E., Public Offices, Southall	do.
Stores	Hanwell U.D.C.	Council Surveyor, Hanwell, W.	do.
1,000 Galvanised Steel Sanitary Pails	Richmond Main Sewerage Board	W. Fairley, Engineer, West Hill-road, Kew Gardens, S.W.	May 10
1,000 Galvanised Steel Ashbins	Warrington Sanitary Works Com.	Cleansing Superintendent, Cen. San. Depot, Howley, Warrington	do.
Forty-four Workmen's Cottages at Little Bray	do.	do.	do.
Ten Workmen's Cottages Adjacent to Town Hall	Bray U.D.C.	C. H. N. Sutter, Surveyor and Architect to Council, Bray, Ireland	do.
*Making-up Street	do.	do.	do.
*New Sorting Office, Old Swan, Liverpool	West Ham Borough Council	Borough Engineer, Town Hall, West Ham, E.	do.
Isolation Hospital, etc., Badsley Moorlane, Rotherham	H.M. Office of Works	H.M. Office of Works, Storey's Gate, Westminster, S.W.	May 12
Stone and Concrete Boat Pier at Gills Haven	The Corporation	J. Platts, County Borough Architect, High-street, Rotherham	May 13
*Enlargement, etc., of Church, Totland Bay	Caithness County Council	E. K. Carmichael, Engineer, 8, North Bank-street, Edinburgh	May 14
1,500 Tons of Unbroken Whinstone	The Committee	Percy Stone, Architect, Newport, Isle of Wight	do.
Switch Gear, L.C.C. Tramways	Great Driffield U.D.C.	G. B. Tonge, Clerk, Great Driffield	do.
Electric Light and Power, Contract No. 10	The L.C.C.	County Hall, Spring-gardens, S.W.	May 17
*Engineering, etc., Works, Leavesden Asylum	Kilmarnock Corporation	Town Clerk, Kilmarnock	do.
Electrical Plant	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	do.
Pumping Machin'y, etc., Sewerage Wks., Markfield-rd.	Ayr District Lunacy Board	W. Maxwell Stewart, Engineer, 55, West Regent-street, Glasgow	May 20
*New Schools	Tottenh'm, etc., Joint Drainage Com.	P. E. Murphy & W. H. Prescott, Eng'rs, 712, High-rd., Tottenham	May 24
Rolling Stock	Gloucester Education Committee	W. B. Wood, Architect, 12, Queen-street, Gloucester	May 28
Detached Residence, Middleton Estate, Ilkley	Royal Siamese State Railways	C. Rivett-Carnac, 23, Ashburn-place, S.W.	Aug. 15
Two Cottages at Chapeltown	.....	W. J. Morley & Son, Architects, Bradford	No date.
10,000 Yards of Mains	.....	R. Mitchell, 17, Haymarket, Sheffield	do.
Alterations to Premises, English-street, Carlisle	Wetherby District Water Co.	J. H. Rhodes, 16, Park-lane, Leeds	do.
Thirty-one Houses in Newport	.....	J. F. H. Harriman, Architect, 26, Castle-street, Carlisle	do.
Additions to St. Peter's Church, Wallingford	H. Duckham	Swash & Bain, Architects, Midland Bank-chambers., Newport, Mon.	do.
Fourteen Houses at Sowerby Bridge	Rev. S. A. Cox	Rev. S. A. Cox, St. Peter's Rectory, Wallingford	do.
*100 Loads of Top Dressing for Football Fields	.....	J. Crawshaw, Architect, Eccleshill, Bradford	do.
Pitch and Creosote Oil	Northern Polytechnic Institute	Northern Polytechnic Institute, Holloway, N.	do.
Pair Semi-detached Villas, Heaton-grove, Bradford	Manchester Paving Committee	Chief Clerk, Highways Department, Town Hall, Manchester	do.
Electric Lighting, Brora, N.B.	.....	Adkin & Hill, Architects, Prudential-buildings, Bradford	do.
	The Committee	J. Ross, Secretary, Brora	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*One Electrical and One Mechanical Draughtsman	Metropolitan Asylums Board	125*l.*	May 2
*Trigonometrical Surveyor	Ipswich Corporation	2*l.* per week	May 4
*Assistant Examiners in Patent Office	Civil Service Examination	Not stated	June 30
*Director of Barrack Construction	War Office	1,500*l.*	No date.
*Deputy Director of Barrack Construction	do.	1,200*l.*	do.

Those marked with an asterisk (*) are advertised in this Number. *Contracts*, iv. vi. viii. x. *Public Appointments*, xix.

TENDERS—*Continued from page* 451.

LLANDAFF.—For the erection of a Presbyterian church in Hawthorn-road, for the Building Committee. Mr. D. Pugh-Jones, architect, Queen's-chambers, Queen-street, Cardiff, and Llandaff:—

J. H. Thomas	£1,896 0 0	Jenkins & Harry	£1,756 15 6
F. Thomas	1,805 0 0	S. Shail, Station-road, Llandaff*	1,675 0 0
W. G. James	1,795 10 0		
E. Williams	1,774 14 6		

LONDON.—For internal and external painting and cleaning at the North Eastern Hospital, St. Ann's-road, South Tottenham, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer to the Board:—

E. Antill & Sons	£4,806 16 10	J. M. Turnpenney	1,820 10 9
Pollard & Beard	2,401 0 0	W. Dudley	1,820 5 0
E. D. Pearcy	2,253 0 0	T. Carr	1,765 0 0
R. Athey	2,204 11 4	M. McCarthy	1,688 0 0
P. McCarthy	2,191 0 0	E. Proctor & Son	1,628 0 0
T. Cole	2,143 0 0	A. H. Inns	1,609 18 0
H. C. Horswill	2,090 0 0	Higgs & Hill, Ltd., Crown Works, S'th Lambeth-road, S.W.*	1,584 0 0
Lake & Son	2,089 0 0	T. French	1,362 17 10
F. W. Harris	2,003 0 0		
J. Groves	1,981 0 0		
Vigor & Co.	1,940 0 0		

LONDON.—For external painting and cleaning, Eastern Hospital, The Grove, Homerton, N.E., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer to the Board:—

H. Bonneam	£1,704 2 8	F. W. Harris	£797 0 0
A. G. Rossiter & Co.	1,507 19 6	Vigor & Co.	796 0 0
F. Islip	1,499 5 6	T. Cole	778 13 10
H. Robinson	1,075 11 0	A. H. Inns	749 12 0
P. McCarthy	991 0 0	T. Carr	749 0 0
G. Wales & Co., Ltd.	979 4 0	E. Proctor & Son	745 0 0
J. J. Richards	955 17 9	B. E. Nightingale	736 0 0
E. D. Pearcey	924 0 0	Higgs & Hill, Ltd., Crown Works, South Lambeth-road, S.W.*	678 0 0
R. Athey	892 10 7	T. French	575 5 6
J. Spencer	808 6 0		
H. C. Horswill	849 0 0		

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Woollaston Bros.	3,800 0 0	Rowley Bros.	3,000 0 0
J. Lidstone & Son	3,530 0 0	J. Chessum & Sons	2,998 0 0
C. Dearing & Son	3,259 0 0	J. Appleby & Sons	2,970 0 0
F. G. Minter	3,193 0 0	Leslie & Co., Ltd.	2,955 0 0
J. Mowlem & Co., Ltd.	3,180 0 0	C. Ansell	2,950 0 0
B. E. Nightingale	3,145 0 0	J. Willmott & Sons	2,928 0 0
J. Shelbourne & Co.	3,087 0 0	L. Whitehead & Co., Ltd.	2,924 0 0
Speechley & Smith	3,075 0 0	Foster Bros.	2,844 0 0
C. P. Roberts	3,070 0 0	Cowley & Drake	2,882 0 0
W. H. Lorden & Son	3,049 0 0	Aldridge & Son	2,870 0 0
		F. Willmott	2,829 0 0
		C. North	2,787 0 0

LONDON.—For sewer and drain work and materials, for the Hackney Borough Council. Mr. Norman Scorgie, Borough Engineer and Surveyor, Town Hall, Hackney, N.E.:—

	For one year. Per cent. above printed schedule of prices.	For two years. Per cent. above printed schedule of prices.	For three years. Per cent. above printed schedule of prices.
J. A. Dunmore	30	30	30
T. Adams	19	17	17
E. H. Jackson	17½	16	15
D. R. Paterson	10½	10	9
G. Porter	7½	7½	7½
C. W. Killingback & Co.	7	7	7
R. Ballard, Ltd.	5	—	—
			Per cent. below printed schedule of prices.
G. J. Anderson, 26, North-st., Poplar, E.*	At schedule prices.	At schedule prices.	2½

LONDON.—For repairs and redecoration at the Norwood Schools, for the Guardians of the Poor of Lambeth. Mr. S. R. J. Smith, architect, 15, York-buildings Adelphi, W.C.:—

W. A. King, Melbourne-square, Brixton* £182

MANSFIELD.—For pulling down buildings and forming, metalling, paving, and sewering Elm Tree-yard, Pelham-street, and Newgate-lane, for the Corporation. Mr. R. Frank Vallance, Borough Surveyor:—

Elm Tree-yard.

J. Greenwood, Mansfield* £630 0 0

Pelham-street and Newgate-lane.

H. Bennett, Mansfield* £1,152 10 8

MARGATE.—For internal and external painting and cleaning works at East Cliff House, Cliftonville, Margate, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer to the Board:—

T. Foat & Son	£395 10 0	J. Brown & Son, Clifton-street, Margate*	£183 0 0
T. Horne & Co.	198 0 0		

MELTON MOWBRAY.—For the erection of hospital and buildings on the Scalford-road, for the Melton and Belvoir Hospital Committee. Mr. E. Jeeves, architect, Nottingham-street, Melton Mowbray:—

F. Read	£12,929 9 8	T. Fish & Sons	£8,894 0 0
W. Woodsend	9,795 0 0	E. Clarke	8,893 10 0
C. Barnes	9,473 0 0	Haskard, Rudkin, & Beck	8,882 0 0
J. E. Johnson & Son	9,394 0 0	Nichols Bros.	8,833 6 11
F. Messom	9,160 1 8	T. H. Harper	8,617 16 2
J. Hutchinson & Son	9,112 0 0	C. Wright	8,470 19 10
W. Maule & Co.	9,089 19 11	E. Frisby	7,835 0 0
H. Vickers & Son	9,065 0 0	T. & H. Denman, Melton Mowbray*	7,795 0 0
J. Freer	8,953 13 8		
Thompson & Sons	8,896 18 0		

PLYMOUTH.—For drainage and other works at the workhouse, for the Guardians. Mr. H. J. Snell, architect, 11, The Crescent, Plymouth:—

T. May	£2,316 0 0	G. B. Turpin	£1,661 0 0
R. H. B. Neal, Ltd.	2,293 0 0	S. Roberts	1,631 0 0
J. Crockerell	1,893 4 10	W. C. Shaddock	1,567 11 0
J. H. Blackell & Son	1,859 0 0	Pearn Bros.	1,540 0 0
W. E. Blake	1,847 10 0	T. Shaddock, Furze Hill-road*	1,522 2 0
J. Paynter	1,796 0 2		

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REDHILL.—For new public house "The Flying Scud," Earlswood, Redhill, for Messrs. Mellersh & Neale, Ltd. Mr E. Penfold, architect, Reigate :—

W. F. Wilkinson	£1,620 0 0	C. Parsons	£1,407 0 0
A. B. Wiles	1,450 0 0	J. King & Son	1,363 0 0
C. Nightingale & Sons	1,430 0 0	J. Waycott	1,288 8 0
Buckland & Waters	1,410 0 0	E. Worsaell	1,240 0 0
		G. Elsey & Sons	1,146 0 0
		S. Jeal	1,145 0 0

REIGATE. — For church room and gymnasium, Blechingley, near Reigate, for the trustees of the Church Room Charity. Mr. E. Penfold, architect, Reigate :—

A. King & Son	£1,099 0 0	G. Elsey & Sons	£1,000 0 0
R. Wallace	1,085 6 10	J. King & Son	940 0 0
F. J. Webb	1,084 17 3	J. J. Pink	939 10 0
Buckland & Waters	1,022 0 0	S. Jeal	850 0 0

REIGATE.—For gardener's cottage and additions to Pendel, near Reigate, for Jarvis Kenrick, Esq. Mr. E. Penfold, architect, Reigate :—

R. Wallace'	£619 0	T. English & Son.	£483 10
J. King & Son	500 0	S. Jeal	460 0
J. J. Pink	487 0		

REIGATE.—For septic tank, filter bed, and effluent drain, with other work, Isolation Hospital, for Reigate Rural District Council. Mr. E. Penfold, architect, Reigate :—

T. Wickens	£808 0 0	G. S. Faulkner	£736 7 7
G. Nightingale & Sons	807 0 0	S. Jeal	730 0 0
G. Elsey & Sons	776 0 0	A. King & Son	701 8 10
Streeter & Todhunter	766 0 0	J. J. Pink	688 6 10
		G. Cummins & Sons	682 6 0

REIGATE.—For three houses, Croydon-road, Reigate, for T. Pither, Esq. Mr. E. Penfold, architect, Reigate :—

J. King & Son	£1,840	C. Parsons	£1,590
A. G. Lovell	1,794	G. Elsey & Sons	1,565
J. Waycott	1,785	S. Jeal	1,562
W. Wickman	1,744		

ROSSETT.—For the erection of a police-house, out-offices, and wall, for Denbighshire County Council. Mr. R. Lloyd Williams, County Surveyor, Denbigh :—

W. D. Simmons & Son	£735 3 5	R. Rowley	£645 0 0
J. T. Jones	675 0 0	R. Williams	644 3 8
J. Johnson	675 0 0	P. Edwards	610 0 0
G. Wright & Sons	650 0 0	R. Randles, Marford, Wrexham*	578 18 4

SHEFFIELD.—For the erection of two sale shops, dwelling houses, stabling, etc., at corner of Willey-street and Wicker, for Mr. Friedrich. Messrs. Hall & Fenton, architects, 14, St. James'-row, Sheffield :—

J. & H. Wheen	£2,700	T. Gray & Son	£2,357
H. Freckingham	2,630	E. & W. Oxley	2,319
J. W. Winter	2,600	J. Masson	2,302
J. White & Son	2,540	H. Watkinson	2,220
J. Bertram	2,501	H. White, Washington-road*	2,195
Vasey & Son	2,489	M. Hancock	2,038
Dyson & Son	2,439		
Moore Bros.	2,420		

[Lowest separate tenders, £2,433 12s.]

TUTBURY.—For the connexion of house drains to new system of sewerage, for the Rural District Council. Messrs. Willcox & Raikes, engineers, Union-chambers, 63, Temple-row, Birmingham :—

E. Boore, Smethwick, accepted on schedule of prices.

SHEFFIELD.—For crematorium, City-road Cemetery. Messrs. C. & C. M. Hatfield, architects, Cairns-chambers, 19, St. James-street, Sheffield. Mr. L. A. Frances, Surveyor, Imperial-chambers, and 8, John-street, Adelphi, London, W.C. :—

Dyson & Son	£3,280 0 0	J. Eshelby & Son	£2,975 0 0
J. Walker	3,270 0 0	J. & H. Wheen	2,897 0 0
J. Fidler, Ltd.	3,230 0 0	Ash, Son, & Biggin	2,740 0 0
W. & A. Forsdyke	3,150 0 0	W. Nicholson & Son	2,674 0 0
A. Bradbury	3,080 0 0	D. O'Neill & Son, Sheffield*	2,480 0 0
J. Wright	3,078 3 8	Wilson & Renington	2,397 0 0
J. Vasey & Son	3,000 0 0		
Works Construction Committee	2,990 0 0		

TOTTENHAM.—For the erection of stables, Whit Hart-lane, Tottenham, N., for Messrs. Fremlin Bros., Brewers, Maidstone. Mr. Augustine C. Green, architect, 111, Fore-street, Edmonton, and 40, Bruce Castle-road, Tottenham :—

F. Bull	£2,225	J. Stewart	£1,827
Wallis & Son	1,989	J. Groves	1,795
J. Almond & Son	1,950	A. Fairhead & Son	1,757
Mattock Bros.	1,897	A. Porter	1,683
W. Lawrence & Son	1,887	H. Knight & Son, Tottenham*	1,594
Elmore & Son	1,885		
A. Monk	1,856		

UDNY.—For additions and alterations to dwelling-house and steading at Manis of Bogfechil, Udny, Aberdeen, for A. Milne Leslie, Esq., of Auchinhuive, Udny. Mr. W. Davidson, architect, Ellon :—

Mason Work : Paterson & Marshall, Udny*	£77 15 0
Carpenter Work : J. Prosser, Straloch, Udny*	139 0 0
Slater Work : Wm. Gall & Sons, Newburgh*	75 0 0
Plaster Work : J. & R. Slevewright, Inverurie*	27 9 0

WALTHAMSTOW. — For extension to electric generating station, for the Urban District Council. Mr. G. W. Holmes, Engineer, Town Hall, Walthamstow :—

S. Palmer	£8,000 0 0	Wellerman Bros.	£4,250 0 0
W. J. Maddison	7,872 0 0	W. Jones & Sons	4,200 0 0
J. E. Saunders	5,133 14 2	H. Lovatt	4,000 0 0
Holliday & Greenwood.	4,998 0 0	W. Lawrence & Sons	3,987 0 0
Todd & Newman	4,955 0 0	Surveyor*	3,794 14 3
J. A. Nightingale	4,481 0 0	Rowley Bros.	3,786 0 0
		F. J. Coxhead	3,497 0 0

WILLESDEN.—For road making and paving works, Brenthurst-road, Willesden, for the Willesden District Council. Mr. O. Claude Robson, Engineer, Public Offices, Dyne-road, Kilburn, N.W. :—

T. Adams	£769	D. R. Paterson	£745
W. Neave & Son	765	B. Nowell & Co.	735
R. Ballard, Ltd.	745	F. Fowles, Willesden*	729

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The Builder.

VOL. LXXXVI.—No. 3195. APRIL 30, 1904.

ILLUSTRATIONS.

New Reredos, Cheltenham College Chapel ..... Mr. H. A. Prothero, F.R.I.B.A., Architect.
New Premises, Westminster Improvement Scheme ..... Mr. W. D. Caröe, F.R.I.B.A., Architect.
Chelwood Manor, Sussex ..... Mr. A. N. Prentice, F.R.I.B.A., Architect.
House at Arisaig ..... Mr. George Jack, Architect.
Houses, Buckhurst Hill, Essex ..... Mr. A. Needham Wilson, A.R.I.B.A., Architect.

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Architecture at the Royal Academy:

THE architectural designs at the Royal Academy this year do not make a very brilliant collection, nor can they, taken *en masse*, be said to illustrate or to represent any defined tendency in architecture at the moment. They are a curious mixture of the classic and the picturesque, with no predominating influence of any school; in fact, as the French maintain that though there are English painters there is no English school of painting, so it may be said, perhaps more decidedly, that as far as the representation of architecture at this year shows, there is no English school of architecture. The one thing that seems at all certainly illustrated is the present tendency to employ classic forms for public and municipal architecture. The general absence of plans is as noticeable as usual, and can perhaps hardly be considered as the fault of the exhibitors, the Royal Academy having so far shown no disposition to recognise the importance of plan in architectural design, and having, in fact, last year, accepted the elevations of an important design and deliberately refused the frame of plans necessary to explain them.

The room contains three models, which we may take first, as they stand on a different footing from drawings; and one of them, the model of the upper part of the tower of the Cardiff Town Hall (1665), exhibited by Messrs. Lanchester, Stewart, and Rickards, is one of the most interesting of the exhibits. It shows three stages, the lower and most lofty one decorated with a Corinthian order, and with an open metal clock face projected from it on each face, the rim of which cuts rather awkwardly across the centre of the columns and partially hides them. At the angles are sculptured figures by Mr. Fehr, kneeling and drawing drapery from behind over their heads as if to protect themselves from the weather—a treatment which has become rather a commonplace in architectural sculpture and seems rather unmeaning, though it no doubt produces a good decorative line. The second stage shows decorative cartouches on the principal faces, and child figures at the angles (over the columns of the lower story) holding the ends of garlands; the plan of this story is very well modelled, and has a sculpturesque effect. The third stage is treated with simpler and broader features, with a rectangular window surrounded by leafage moulding on principal face; at the angles a small curved buttress sets back the composition to the circular plan of the crowning feature. Altogether, this is a very satisfactory and artistic design. Mr. C. S. Peach exhibits a "Model of electricity generating station, Mayfair, with Italian garden on roof" (1664). This shows a square pavilion with a pediment and columns on each face, surmounted by a plain hemispherical dome, and with steps at the side giving access to the balustraded platform, on which, we presume, is the garden (not shown in the model). It is a very good example of architecural treatment applied to a building for a practical purpose. The only detail we do not quite like is the large console under the apex of each pediment; it fits awkwardly into the angle of the pediment, and does not seem architecturally in its right place there. The third model, exhibited by Mr. Arnold Mitchell, is that of King Leopold's cottage *à l'Anglaise*, near Ostend (1663). This is the more ordinary kind of coloured realistic model of a house of the picturesque type, with many gables, and some black and white timber and plaster work introduced; there is a little too much of the toy about it. A small plan is affixed to the stand.

After the models we may take the exhibits of the members of the Royal Academy. Mr. Aston Webb shows a perspective drawing and a plan of the "Proposed architectural treatment of the surroundings to the national monument to Queen Victoria in front of Buckingham Palace" (1498); this is his diploma work, deposited on his election as an academician. It does not differ materially in architectural treatment from the competition design as illustrated in our issue of November 2, 1901; but the public carriage-way is now within, and not, as before, outside of, the architectural screen. We presume this represents the form in which it is now to be completed. We see again the semi-circular colonnaded screen with its architectural pavilions, and the interior fountains with semi-circular basins surrounded by parterres, and the sculpture monument in the centre. We rather doubt about the two strips of water on each side of the central monument. To our thinking, if a monumental erection of this kind is to be connected with water, it should be placed in the centre of a complete basin (circular, square, or oval), as in the case of Dalou's monument to the Republic

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on the Place de la Nation. It may be objected that in that case no one can get up close to the monument to inspect it; but, then, do you want to get close up to a sculptural monument on a large scale? At all events, the position of such a monument in the midst of a surface of water, which forms a frame or setting to it, has a very fine effect; whereas the provision of a strip of water on each side of it, with a dry land connexion in front and rear, seems neither the one thing nor the other, and might be better omitted. In other respects this monument is a fine example of the importance of a grandiose plan and conception in a case of this kind; the details may not be specially remarkable in themselves; what makes it is the conception as a whole. Mr. Bodley exhibits a view of the "New Roof at Magdalen College Hall, Oxford" (1,572), a very good imitation of a late Gothic timber roof, and that is about all one can say about it; and a very nice water-colour sketch of the new tower of St. John's Church, Cowley, Oxford (1,581), in which an effective feature is made of a square staircase turret, which projects somewhat like a great buttress (if it were not for the window slits) in the centre of the face of the tower, and at the top of which, just below the parapet string course, is a crucifix in relief with a figure on each side of it; the sculpture being accentuated by the extreme plainness and simplicity of the general architectural treatment. Mr. Belcher exhibits a rather slight water-colour sketch of the interior of the Board-room of the Royal London Friendly Society (1621), a room with a ceiling of elliptical section with paintings in the centre panels, some of which, as far as one can judge from the indications of the drawing, seem to be a good deal too pictorial in character for their position—we catch a glimpse of painted architecture in one panel, with columns painted in a horizontal position, a most bewildering procedure in a ceiling painting. Apart from this, the lines and proportions of the room are, architecturally, very pleasing. Mr. Jackson exhibits a rather rough pencil drawing of part of the exterior of the new chapel for Hertford College, Oxford (1568), a curious piece of imitation of the mongrel classic character often found in late Renaissance work. There are coupled round-arched windows separated by a Corinthian column partially fluted, and flanked by ornamented pilasters, and an octagonal turret with an open colonnade near the top and a circular lantern over with little scroll buttresses. This kind of mingling of rather bastard detail is characteristic of much of Oxford architecture, but its artificial creation seems hardly worth while. The carved foliage which forms the balustrade over the porch is quite out of scale with the capitals and other architectural details, but this may be only an intentional characteristic of what is essentially an architectural *mélange*.

Among the public buildings illustrated the most important is Mr. Caröe's "University of South Wales and Monmouthshire: illustrated in a large bird's-eye view" (1563), the only way of showing the extent of the building, but an unfortunate method of illustrating architecture, as it brings before us so much of roof and skylight which, in an ordinary and what may be called the natural view of the building, is neither seen nor intended to be seen. We described this design fully at the time of the competition (see the *Builder* of October 17, 1903). The plan is the really best element in the design, but naturally the author knew better than to trouble the Academy with a plan, which would certainly not have been hung if it had been sent. However, as we are fortunate enough to have the plans and elevations, as well as this bird's-eye view and as this is one of the largest and most important of recent architectural schemes, we propose to give the whole together in our next issue, when the view will receive from the plans the explanation which it does not receive at the Academy. Another drawing is shown of the principal entrance (1564), a boldly-treated piece of building with a pediment and order and a sculptured frieze between the upper portion of the columns. We should think the draughtsman had rather exaggerated the proportions and projection of the rustication blocks in the colonnade of the porch. Mr. Caröe's other exhibit, "New Premises for the Ecclesiastical Commissioners, Westminster" (1450), is illustrated in this number (see lithograph), so that we may refer the reader to the plate in place of further description.

Among other examples of public buildings is Mr. E. M. Gibbs's "Extension of the Sheffield Public Museum and the Mappin Art Gallery" (1448); a long, low classic front of one story, accompanied by a small block plan which enables one to understand what has been done. The already existing building consisted of a block with a colonnaded front, and an annexe a little set back from it on the left. This annexe is now merged in a large additional block, which is advanced in front of the central building, to which it is connected by a pilastered quadrant; the centre of the front is diversified by a projecting semi-circular colonnaded porch. On the right the site runs out to a point, but the scenery of the new front on the left is cleverly repeated on the right by a quadrant gallery, leading to a small gallery, the flank of which is similar in design to the front of the new building on the left. Thus, in spite of the irregular proportions of the site, a symmetrical front is cleverly obtained, which is graceful in itself and quite in keeping with the demands of the severe classical style of the whole, and in its conventional way this is a very clever and satisfactory piece of architectural design. Next to this is Mr. Murray's competition design for Hull Town Hall (1449), a solid and dignified piece of classic work. A very severely designed façade with a rusticated ground story and columned and pedimented windows above, is broken by two pavilions equi-distant from the centre, with pediments and an order, and a roof in the form of a square dome (not an agreeable form); these are echoed by smaller and less important pavilions near the ends of the façade. There is not an original detail in the design, yet the whole is original, from its general design and grouping. Unfortunately there is no plan. Another design in the same competition is that by Messrs. Jemmett and McCombie (1508), which is accompanied by a small plan, hung too high for it to be well seen, but which appears to be a design of considerable merit and originality of effect and grouping; the treatment of the narrow end of the building with three lofty arches, is very bold and effective. Another municipal design is that for "A Town Hall for a London Borough" (1438), by Mr. Bernard H. Webb; we fancy a student's design, but a creditable piece of work; and Mr. W. F. Harber's very clever and meritorious competition design for Cape Town University (1513), which was published in our issue of February 20, and which we are glad to find has met with recognition at the Academy.

The design for the English pavilion at the St. Louis Exhibition (1497), by Messrs. Ernest George and Yeates, appears to be a kind of double-barrelled reproduction of the Orangery at Kensington, with a connecting colonnade screen between the ends of the two blocks. If there were a plan we should understand exactly how this was; but, of course, there is none. The drawing is coloured so as to give the idea of bright sunlight, and looks very well. Mr. Champneys's "New Library, Somerville College, Oxford" (1433), is one of those designs in which this architect seems to endeavour to show us how it is possible for an architect who can do better things to put the minimum of interest or charm into a building; starved strips of pilasters with decanter-stopper terminals above the roof line form the only features. This over-acted architectural simplicity is a kind of affectation which really becomes absurd.

A large perspective view of the King's Sanatorium (1519) is exhibited by Mr. Percy Adams. This is a kind of building in which plan is all-important, but no plan is given, and the architectural detail is necessarily of little interest in itself except for a simple but characteristic treatment of the tower in the centre; otherwise, it is mostly windows and green shutters. Messrs. Hawke and M'Kinlay's "University of the Cape of Good Hope" was illustrated in our issue of May 30, 1903, to which we may refer the reader. Mr. Lionel Detmar's "Design for a Country Town Hall" (1543) is a study for a building in Late English Renaissance, very suitable in expression for its purpose; the lofty arched recess in the end wing, including two stories of windows, is a good point. Mr. Hare's "District Council Offices. Pontypridd" (1553) is perhaps the best bit of classic design in the room. It is difficult to describe, from the fact that it is rather novel in treatment; but it is a piece of admirably-balanced, symmetrical design, and would have been worth a better drawing. Mr. Hare's "Central Library, Hammersmith" (1546) is also a very pleasing front, but with an architectural treatment which is not so new. The Law Society's New Hall, by Mr. Percy Adams, which was illustrated in our issue of last week, is here illustrated by a perspective drawing. Messrs. Simpson and Allen's "Cartwright Memorial Hall" (1584) is hardly a view of the building, but one feature in it—a colonnaded semi-circular pavilion with a lofty and very solid rusticated basement; it makes an effective drawing. Mr. Brierley's

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"County Hall, Northallerton" (1609), with its red brick walls and stone dressings, has a very decided look of an old XVIIIth century town hall; it is pleasing and suitable enough, but seems a rather careful attempt to avoid all appearance of having been designed and built in the present day, except only for the lofty green-slated roofs. We may observe, however, that the classic pediment with the horizontal cornice returned a little way inwards and then broken short off, seems to have become recently quite a feature in modern municipal work; it meets us over and over again in the architectural room; and it is a very poor and illogical feature, only consecrated by habit and association. In the centre of one end of the room is a very large and finely-executed pen drawing of "The 'Formidable' Nautical School, Portishead" (1620), by Mr. E. Gabriel; no plan is given, and the architecture, of which the prevalent character is given by what appear to be brick pilasters on a *fond* of white rough-cast, is of no particular interest; yet this is the largest drawing in the room. What claim has it to this central position and this large space, but what is furnished for it simply as a piece of careful draughtsmanship? That is surely not the ground on which space should be allotted in the architectural room. Messrs. Hubbard and Moore's "Proposed Façade for the Ironmongers' Hall, Fenchurch-street" (1649) has a powerfully treated and effective centre, with the vertical lines of the engaged order contrasted by horizontal lines of window-dressings and frieze carried across, but it is rather too much cut up into bits, and the projecting pavilions at the ends clash with the rest of the design. A more satisfactory front is Mr. Cross's "Haggerston Public Baths," which, with its wide gable, central loggia in the middle story, and two doors opening in a plain ground story, shows a good deal of individual character.

We shall have other remarks to make on other classes of work illustrated; but nothing can ever be done to satisfactorily represent architecture in the present small room, which is quite inadequate. The proper representation of architecture requires plans as well as pictures of buildings, a matter fully recognised in France, but which the English Academy seem totally unable to learn. What the Academy might very well do would be to give up the large water-colour room to architecture, and put the water-colours in the present architectural room. The water-colour room at the Academy is of only secondary importance, as the leading water-colour artists have their own exhibition, and reserve their works for that. There would then be something more like space for the proper illustration of architectural design, which in the present room is impossible.

MEMORIAL TABLET IN LINCOLN CATHEDRAL.—A memorial tablet, in memory of the late Major Brinkley, was recently unveiled in Lincoln Cathedral. The memorial has been placed in the west porch, and consists of a white statuary marble tablet, with English alabaster ornamentation, in the classic style, surrounding it. The work has been executed by Messrs. M. Tuttell and Son, of Lincoln, from the designs of the Cathedral architect, Mr. Charles Hodgson Fowler, of Durham.

NOTES.

The Trade Unions Bill.

THOUGH the second reading of the Trade Unions Bill was carried last week by a majority of thirty-nine, it is not likely to become law during the present session. Though the Government, as such, did not oppose it, the members of the Cabinet do not approve of the measure, and therefore it will have none of the assistance necessary to enable it to pass into law. If we look at the substance of the Bill it is obvious that it contains at least one undesirable provision. "Peaceful picketing" for the purpose of persuasion and argument may be well enough in theory, but if a hundred or more strikers surround a manufactory with a view to persuade a non-striker to desist from work, it becomes, in fact, actual or indirect terrorism. But, indeed, why should workmen be troubled in this way? Why should not a man be allowed to go about his work without this kind of persuasion? As regards the part of the Bill which deals with the liability of Trade Unions for damages caused by the acts of members, it is sufficient to say that no legislation can be proper until the Royal Commission has reported. This is essentially a case where, in the interests of workmen, legislation should be reasonable and, as far as possible, final, and calculated to prevent Trade Unions being used for purposes of trade warfare when their funds have been collected for benefit and superannuation purposes.

Metric Weights and Measures.

A REPORT made this month by the Weights and Measures Committee of the Herefordshire County Council expresses some particularly reasonable views upon the practical difficulties which would attend the application of the metric system. It is pointed out that the decimalisation of our coinage is as important as that of our weights and measures, and that either without the other is robbed of more than half its value. This is quite true, and it is the fact that in no country is the metric system in general use without decimal coinage; while some countries, such as Canada and the United States, have for several years employed decimal coinage without adopting metric weights and measures. Indeed the general rule of the world has been to introduce the decimal coinage first and metric weights and measures afterwards. Hence there is some justification for the proposition contained in this report, that to deal with units of weight before altering our present system of coinage would be to put the cart before the horse. The difficulties connected with any alteration in British coinage were considered by the Commission of 1859, and their report has certainly done nothing to further reforms. If any change were made in this direction it would probably be advantageous to place ourselves in line with those continental nations among whom the franc or its equivalent is a recognised unit, and from which the values of other standard decimal coins could be readily calculated by ourselves and foreigners alike. There is no doubt that practical familiarity with decimal coinage would be invaluable as a preparation for the introduction of decimal weights and measures.

The Roads Improvement Association.

THE Report of the Roads Improvement Association for 1903 dwells too much on the futile report of the Departmental Committee on Highways which we referred to last year. It is certain that "National" roads are not within the sphere of practical politics, and the best work that the Association can do is to assist local effort in getting district roads turned into main roads, and in impressing on highway authorities the necessity of widening roads which are too narrow for modern traffic. The great need in regard to highways, at the present moment, is to concentrate as many highways as possible in the central authority, the County Council. In some counties this body has become the sole authority by declaring all roads to be main roads. This change will not, however, become general without legislation, and the Association would do well to concentrate attention on this object.

Registration Politics.

A correspondent writes: "A movement is on foot amongst the 'registrationists' to insure the return at the coming election of only those members on the Institute voting papers who are pledged in favour of registration. A more short-sighted policy it would seem hard to imagine. The question of the registration of architects has now been before us and the public for years, but no very workable scheme has yet seen the light, and for the very simple reason that a workable scheme is by no means an easy thing to produce. To pack the R.I.B.A. Council, therefore, with men of 'one colour' only, does not seem the most likely way of producing anything which will appeal to the whole profession. That a number of architects are in favour of something of the sort, particularly in the provinces, seems to be pretty generally accepted; but in view of the fact that a large and representative committee has lately been appointed to report direct to the Institute upon the whole subject, any attempt to divide members, and particularly the Council, into two camps before any report has been received from the recently appointed committee seems most mischievous and unnecessary, the more so in the case of the Council, as the matter is no longer under their control, having been referred by the general body to a specially appointed committee, whose report will, no doubt, in due course be laid before the Institute for consideration. Until then surely the matter might be allowed to rest."

Proposed Excavation of Herculaneum.

THE correspondent of the *Times* in Rome writes that there is to be a serious effort made to excavate Herculaneum, by the co-operation of Italy with all civilised countries, with a central managing committee in Rome and national sub-committees elsewhere. It is good news that such a project is in contemplation, for the result may and probably will be of exceptional interest; and there will be no lack of enthusiasm on the subject among English archæologists, but they will have to subscribe out of their own pockets. In

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all probability every European government will vote some public money in aid of such an enterprise except our own, to which art and archæology are objects not worth spending money upon.

The Fire at Rochester, U.S.A.

PROPERTY to the value of over 500,000*l.* was destroyed in a conflagration at Rochester, U.S.A., towards the end of February, and technical details regarding this fire have now come to hand. It is interesting to observe that, as in the case of the Baltimore fire, the terra-cotta or tile floors were again seriously damaged by losing their lower—and to a considerable extent their vertical — webs. Although the tile arches in the so-called "Granite Building" have not fallen, they will practically one and all have to be reconstructed owing to loss of strength. As in the case of Baltimore, the tile work did not even have the extra strain of the application of cold water, which if applied to heated tiles leads to cracking and to a considerable amount of disintegration. To quote the official report of the United States Government Engineer on the Baltimore fire, whose opinion is again borne out at Rochester, "Hollow terra-cotta suffers a large percentage of loss in its commercial forms owing to mechanical failure under stresses due to expansion of construction," and this opinion should be compared with another portion of the same official report which states in respect to concrete that "the efficiency of concrete on the whole is high, and is preferable to commercial hollow tiles for both floor arches or slabs and column and girder coverings." After that official dictum it is unlikely that any more Government and municipal work in the United States will show terra-cotta floor construction, and the sooner this example is followed in England the better, in all probability, for the general public.

The London, Liverpool, and Globe Insurance Co.'s Offices.

NEW premises are being built by Messrs. Colls and Sons, contractors, after Mr. J. Macvicar Anderson's plans and designs, for the London, Liverpool, and Globe Insurance Company. They stand in what has been called the most valuable position in the City, at the corner of Lombard-street and Cornhill. The former offices of the Insurance Company, on the same site, are commonly described as having been erected in place of the house and shop—afterwards Pidding's lottery-office at the "Lucky Corner"—of Thomas Guy the wealthy publisher and bookseller, who in his lifetime built and equipped three wards of the old St. Thomas's Hospital, and four years before his death in 1724 formed the design of building and endowing the adjacent hospital which bears his name. But that statement does not take into account the fact that considerable alterations were made there for the laying-out, by William Mountague, the City Architect, of King William-street in 1824–30. The changes involved the demolition of the then Nos. 1–10, Lombard-street, south side, together with Dove-court and Little Lombard-street (where is now the widened road in front of St. Mary Woolnoth Church), and also the removal of some of the opposite houses in Lombard-street and at the angle with Cornhill, which extended westwards a short distance further than they do at the present day. Thus the site of Guy's house, at No. 1, Cornhill, is now that of the roadway immediately opposite the west front of the Insurance Company's new premises.

The '91 Art Club.

THE exhibition of the '91 Art Club, open for a few days only at the rooms of the Alpine Club, will be closed before these lines appear; but it merits notice as a collection containing a good deal of interesting work by artists some of whom are not known in other exhibitions. Among the paintings were two by Miss Lancaster Lucas, the secretary, "The Visit to the Grandparents" and "The Reading Lesson," which show fine composition and drawing, and the first-named one has a quality of pathetic expression, though rather unnecessarily cold in colour, a defect not to be found in the other one. Among other and smaller works we noticed a landscape in tempera, "The Mowers," by Miss Lota Bowen; two landscape sketches at Nairn by Miss Kincaid; Miss Pringle's "Ponte della Spade, Venice"; portraits by Miss Gwenny Griffiths and Miss Frances L. Ramsay; and "Whitby Harbour," by Miss Emily Duncan. The sculpture included some charming things by Miss Rope, especially "A Bronze Mirror Frame," with a little figure in relief at each end; "Sailing Towards the Dawn," a bas-relief of children, which we think we have seen before; and "Winged Mischief," a charming little square panel in which a winged child in relief is designed so as to form a decorative filling to the space. In the same kind of manner Miss Dorothy Rope has treated two square panels in high relief with figures representing "Captive Summer" and "Spring, the Deliverer." The exhibition included some good handicraft work—book-covers, jewellery, etc.; among which may be especially mentioned Miss E. Sparks's "Blotter" of white goat-skin with figures in relief, and a silver and chrysoprase pendant and a boldly-designed silver belt by Miss V. Ramsay.

Advertising Designs.

MESSRS. SPOTTISWOODE have got together at 13, Bruton-street, an exhibition of advertising designs, largely produced by their own staff, but with some contributions from outside artists. It is almost needless to say that there is nothing like the artistic fancy and originality which would be seen in a French collection of advertisement and poster designs; and some of them, such as the chocolate advertisement (61), consisting mainly of a pile of boxes with a child sitting on the top, cannot be said to come into the artistic category at all. Among the best executed is the railway poster (33), by Mr. F. Taylor, showing a group of people on a steamer, coloured in flat tints in a decorative manner. The shipping poster (56), by Mr. Ellis Martin, is a good picture of steamers. A telephone show-card, a decorative design with a figure framed within a classic architectural border, is among the best. Among furniture advertisements the interior of a room (10), by Messrs. Stacey Aumonier and J. Morton, is a good drawing; so also is an interior of the same class (90), by Mr. Fred Taylor. Mr. Munning's "Starch Poster" (103) and Mr. Lee Hankey's "Polish Poster" (106) are both very good; and Mr. Buchel's theatrical poster (132), a figure of a lady in a dramatic attitude, is an excellent piece of work. But it cannot be said that the show as a whole illustrates what art can do with advertisements; most of it does not rise higher than a certain superficial cleverness.

Water-colour Illustrations of Egypt.

AT the Hanover Gallery is a collection of water-colour drawings of scenes in Egypt, by Mr. John Varley, a grandson of the celebrated early water-colourist of that name. These are all very capably-executed drawings, but they rather represent what we should call good topographical illustrations than examples of the higher artistic interest of landscape painting; nor is it easy to pick out any for special mention. They are in a very equable style, all of them good up to a certain standard, but rather deficient in force and character from the purely artistic point of view.

Drawings for Chromo-lithography.

AT the Dutch Gallery, in Brook-street, is a collection of Moorish sketches in colour by Mr. A. S. Forrest, painted especially for reproduction in chromolithography by the "Three-Colour" process. The following quotation from the catalogue preface may be of interest:—

"The Three-Colour Process is built up on the theory that there are but three primary (or elemental) colours, yellow, red, and blue, and that by the blending of two or more of these in varying proportions all other colours may be obtained. . . . But here the painter finds himself in a greater difficulty than the printer, for, strangely enough, a purer yellow, a purer red, and a purer blue can be obtained in printer's ink than in oil colour. That is to say, in the latter it will be found that the purest yellow has more red or more blue in it than has the purest printer's ink of that colour, and so on in the cases of the red and the blue. To get over this difficulty the painter in oils is obliged to double his elemental or primary colours; he must have two yellows, two reds, and two blues; he will obtain them as pure as possible but they must have opposite tendencies, for example, one yellow must incline towards red, the other towards blue; one red must incline towards yellow, the other towards blue; one blue must incline towards yellow, the other towards red."

In addition to these he must have white; and the colours used in these paintings are chrome and lemon chrome; crimson lake and vermilion; cobalt and ultramarine; and white. The suitability of the scale of colour for its purpose is shown in the reproductions, a book of which was in the room for inspection. But it makes rather a mechanical kind of painting, and the collection is not of the artistic interest which we usually find in the exhibitions at the Dutch Gallery.

Exhibition of Lace and Embroidery.

THERE is a most interesting exhibition of old embroideries and lace at Messrs. Debenham and Freebody's, in Wigmore-street. Besides the actual embroideries on silk and satin, there are some very curious old pictures in frames, many of them of the Stuart period. No. 311 in the catalogue is a very remarkable piece of work, the figures in very high relief, the tiny heads and hands made in wood, covered with moleskin. It represents Charles I. at the door of his tent, Queen Henrietta Maria and others coming

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towards the tent. It was discovered in a loft attached to an old mansion between Ashley St. Leger and Catesby Castle. On the back is a description of the picture. There are several others of the same period, all with quaint stiff figures elaborately dressed, and standing out in relief from the background. There is one, which appears to belong to a different period, of the judgment of Solomon. The central figure has a fine dignity of pose. The embroideries are very good specimens of Italian and Spanish work, No. 170 in particular, a chasuble set in gold and floss silk on a cream-coloured satin. There are several very beautifully embroidered waistcoats. The exhibition of old lace is most interesting, though one's feeling of enjoyment is considerably marred by the recollection of the injury to the eyesight that must ensue after long application to such work. There are some yards of point d'Angleterre made in Brussels, as fine and filmy almost as a cobweb, and yet with the most elaborate and beautiful stitches. As a contrast to this there is some Venice point, which has a bold, exuberant style about it. There are two pieces of Genoese lace in which the pattern wanders about in the most bewitching way. A very formal pattern in pillow lace is a mistake. One very magnificent specimen of Flemish point is spoilt by the formal regularity of its design, though one is filled with admiration at the way in which it is carried out. It is difficult not to be enthusiastic over this lace exhibition; in its way the work is as beautiful as painting.

THE ARCHITECTURAL ASSOCIATION.

AN Ordinary Fortnightly Meeting of the Architectural Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., Mr. H. T. Hare, President, in the chair.

The minutes and some nominations having been read, the following gentlemen were elected members of the Association, *i.e.*, Messrs. S. R. Neate, H. B. Elkington, and R. J. Casement. It was also announced that Mr. F. Wheeler had been re-instated as a member.

New Premises Fund.

The Chairman announced the following further donations to the New Premises Fund:—Messrs. E. B. I'Anson, 25*l.*; G. F. Bodley, R.A., 10*l.* 10s.; B. F. Fletcher, 10*l.* 10s.; C. D. Lutyens, 10*l.* 10s.; J. W. Beaumont, 5*l.* 5s.; J. Howard Colls, 5*l.* 5s.; W. H. Scrymgour, 5*l.* 5s.; Thos. Worthington, 5*l.* 5s.; H. G. Lidstone, 2*l.* 2s.; C. J. Marshall, 2*l.* 2s.; H. H. Martyn and Co., Ltd., 2*l.* 2s.; James Miller, 2*l.* 2s.; John Borrowman, jun., 1*l.* 1s.; T. R. Bridson, 1*l.* 1s.; and F. F. Le Maistre, 1*l.* 1s.

He also announced that an informal reception of members and donors would be held at the new premises, Tufton-street, on Tuesday, May 10, from 4.30 to 6.30 p.m. As the reception would not in any way be a formal one, members would not receive any special invitation, but if they cared to attend they would be welcome.

Members' Dinner.

The Chairman also announced that the members' dinner will be held at the Criterion Restaurant, Piccadilly-circus, on Friday, May 13, 7-7.30 p.m. Tickets for members, 5s. each; non-members, 7s. 6d. He hoped there would be a large attendance. Although they were announcing a "dinner" this year instead of a "supper," it was not the intention to make it a formal dinner, as the dinners of the Association were some years ago. It would be more or less a domestic function, although there would be a few visitors, and there would be a good musical programme.

Mr. Louis Ambler, Hon. Secretary, announced the following donations to the library:—"Life, Work, and Influence of Robert Adam and his Brothers," by John Swarbrick, presented by the author; and the following books from Mr. B. T. Batsford:—"English and Scottish Wrought Ironwork," by B. S. Murphy; "Stresses and Thrusts," by G. A. T. Middleton; "Scaffolding," by A. G. H. Thatcher; "How to Estimate" (second edition), by J. T. Rea. A vote of thanks having been passed to the donors,

The Chairman read the list of nominations for officers for Session 1904-1905. (See our issue for March 12, page 276, for full list.) The following gentlemen were appointed to act as scrutineers, *i.e.*, Messrs. J. W. Donnington, T. C. Yeates, Lancelot Simmons, and W. Paul.

Mr. W. Gilbert then read the following paper on "Craftsmanship":—

Craftsmanship.

It is with diffidence that I speak to you on a subject and under a title which you have chosen for me and which I should not have dared to have chosen for myself; still it is one nevertheless which has always had a peculiar fascination for me, and since this is a year which will mark an epoch in the existence of the Association of which you have been kind enough to honour me with membership, I venture to convey to you suggestions as to some of the uses of that school in Westminster which, by its enlarged opportunities, will give such impetus to that energy and enthusiasm which has prevailed for so many years in this Society, and be a renewed and extended means of providing greater co-operation between all who work for the completion of a building beautiful in its structure and its adornments.

Craftsmanship.—The word craftsmanship conveys to us the thought of human achievement, that "homely fancy and lovable humility" which seems so synonymous with mediæval art. But it is more than this for it is the expression of the national life and thought of a nation as told by the products of the hands and brain brought forth by necessity.

On the one hand you may have the craftmanship of the savage, fierce in the joy of ornamenting his weapons of war; on the other hand that of the Greeks—godlike in his certainty and correctness, conveying always the sublime assurance in which the dignity of the mind was always paramount—or contrasting with this philosophic calm and correctness that of the mediæval age, in which you have the expression of the mind in its very humanity—the humanity absorbed by the overpowering Diety, in which man exposed his human traits and weaknesses in the expression of his hopes and fears; his desires, his successes, and failures, his loves, his sports, and the glories of his house, his dress and his town; or you have that latter work of the early Renaissance days, when we have the commingling of the humanity of mediæval with the legends of the Greeks.

Origin in the Family.—Craftsmanship originated when the savage made his first article of necessity and the genesis of the inherited trades which afterwards developed into the mediæval guilds was when the father handed that knowledge and experience to his son. In early days the inheritance of trade was compulsory by law, and a son was compelled to follow his father's trade and carry on the secrets peculiar to that business. It is a very short step from this, as demand grew greater for the adoption of a relative, and eventually one not even of blood relationship, into the family circle by a compact for mutual benefit.

Development with Trade.—And with this growth of society, men felt the necessity of a more extensive brotherhood than their own immediate relationship, and they began to band themselves together to protect their own trade, to maintain their independence, and to render and receive aid when needed. These organisations, which were of a very ancient date (for we have the origin of freemasonry at the building of the Temple, the Solonic laws in Athens, recommending the founding of trade societies as promoting the benefit of the whole community, and in Rome Numa Pompilus, uniting musicians, carpenters, coppersmiths, dyers, jewellers, shoemakers, potters, and tanners into associations, in England Alfred and Ina of Wessex framing laws for them), these organisations, through the expansion and increased vitality of industry, developed into those powerful societies known in the Middle Ages as the Craft Guilds.

Formation of Guilds, Uses and Benefits.—These guilds were designed to suppress trade frauds, insure skill and care in workmanship, to secure the proper use of proper tools; to provide for due remuneration and recreation and the permanent employment of craftsmen; to check injurious competition; to fix the rates of wages; to arbitrate between customers and craftsmen; to fine incompetent workmanship. (Our modern trade unions strike against low wages, but I never yet heard of them striking against doing bad work.) They were associations for mutual help and poverty was unknown. When a craftsman wandered he was received as a brother in his particular craft, and one can well imagine the ready and keen delight he would be asked for, and would give, information of the great work that others in the craft were doing in other places. These sojournings too, with the wonderful ideas which would be passed along, would encourage men to realise the gradual growth of that strength which eventually made them the masters of the cities and the advisers of the State.

Apprenticeship.—Apprenticeship was absolutely necessary and compulsory among the producers of the art of the Middle Ages. There was little or no division of labour among them—a man knew his work from end to end. Each skilled craftsman might only take one or two apprentices at a time, for they learnt by working with him. A likely youth was known to the rulers of his craft from his apprenticeship, and his progress was watched by them as by members of his family. At a certain stage the apprentice, by executing a piece of work and showing the excellence of his skill, became a master and a voting member of the Guild, and only thus would he be allowed to become an employer of labour.

Then as a citizen the dignities of the cities were open to him and the great things of his art. He might become the executant of those imperishable records erected by a grateful State to commemorate the services rendered by a distinguished son to her glory, or his genius might become the source of pleasure and pride, which his Sovereign would take delight in lavishing on the rulers of neighbouring States or those whom he desired to honour.

Thus under the Craft Guilds each fully-instructed craftsman was by all surrounding conditions encouraged to be an artist whose labours gave a joy and a pleasure to his existence; and by this means taste and knowledge of what art was then possible spread widely among the people and became instructive in them, so that all manufactured articles, as it were, grew beautiful in the unobtrusive and effortless way that the works of nature grew. The result of five centuries of this popular art is obvious in the outburst of splendid genius which lit up the days of the Italian Renaissance. Men whose hands were skilled in the fashioning of things could not help thinking the while, and soon found out that their deft fingers could express some part of the tangle of their thoughts. They introduced the elements of hope, of pleasure into all their labour, they took an active interest in their work. The exquisite armour of the knights, their swords and their lances, the decorations of their buildings, their hangings and their furniture, their domestic utensils, their dress and costume show that the art of the Middle Ages was a thing loved and cherished and made beautiful for its own sake.

Its Powers, Socially and Municipally.—All the guilds chose some particular saint to protect them, and where possible they chose one of peculiar interest to their trade.

With the great wealth which they possessed, and by reason of their power in the State, they provided masses, altars, painted windows, and even whole churches in their honour, and their important functions occurred on the namedays of their saints.

The ostentatious displays and quarrels of the noble caste, while providing the opportunities for the skill of the craftsman, released him from his servitude and provided those political rights, of which he so skilfully availed himself that he quickly became the ruler of free cities and the explorer of unknown lands.

Decline and Reason.—And it was this overleaping ambition which was the ruin of the craftsman and his art. For just at this period conditions arose which gradually turned the workman from the mediæval craftsman into the mere artisan labourer of the capitalist system—the guild system was ousted out by the workshop. The discovery of America, of the Cape route to India and China, the conquest of Mexico and Peru, the battles in the Levant, all combined to overwhelm the natural means of production. New worlds of adventure, new worlds of thought—the inexhaustible and

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previously unheard of and even undreamt of supply of precious metals in their raw state—the enormous abundance of every material and riches gained by commerce forced on development at headlong speed.

To keep pace wider organisations of labour were needed, a more and more regulated division of labour became essential to compete with this haste to seize opportunities, workshops grew larger and larger, the workman ceased to own any portion of his productions.

The increasing amount of capital also needed for success in business as the markets grew and the town supplied not only the country, for foreign lands gradually broke down the democratic constitution of the trade; it was no longer a matter of course for a capable apprentice and journeyman to become in due time a master of the craft; on the contrary, the capitalist master exercised increasing authority within the Guild and turned its machinery to the disadvantage of the poorer members.

Decline of Art.—And it was this sub-division of labour which brought about the divorce of the artist and the craftsman, this overwhelming flood of demand which engendered the scientific spirit which concentrated its energies to the increase of wealth. And art by no means stood still in these latter days of the Renaissance, but took the downward path with terrible swiftness.

So, in this ever-increasing flow of trade the craftsman was separated from the artist, the thinking powers of the one were eradicated, and the knowledge and ideas of the other were limited to effect the greater expedition of the work, and so, by the abuse of drawing as an art rather than as a means to an end, brought about step by step the separation of art from utility. It was this which bred the commercial spirit which is so rampant even to our own time.

Art is man's expression of joy in his labour, and this stereotyping influence, with its scientific and mathematical laws for the unnatural and forced production, brought about the degradation of craftsmanship and became the means of the extinction of art. Sham art is irksome to do and degrading labour, and the result was that the crafts became so degraded by past workmanship that educated men appeared to lose caste by touching the work.

Its Resuscitation.—The world had advanced too quickly for the artist constitutionally conservative in ideas, but it is as useless to attempt to stem this tide of energy and requirements by using mediæval methods of production as it would be to attempt to stay the sun in its daily course. Nevertheless it is the artist's duty to bring his brain to bear on our requirements now as much as they did naturally in the past, and even more so, for the difficulties to overcome are greater. And however one may regret the necessity, the artist must adopt the modern methods of production, making the machine subservient to his will, and the instrument of his power.

Adoption of Modern Methods of Production.—In the course of a recent criticism which I ventured to make on the methods and work of Birmingham casters and die-sinkers, I received a letter from a Birmingham firm of die-sinkers complaining that machine work was cutting out the hand work, and since apparently one seemed only to be getting labourers' wage the art of die-sinking would soon be an art of the past.

I have here some medals lent me by my friend, M. Janvier, which I think, after making all allowances for the national differences of temperament in viewing art, effectually dispose of the fallacy that a machine reproduction of artistic value is impossible.

In die-sinking and stamping it is, as in everything else, the mind which inspires and asserts the mastery over the material and the machine, and I recall the use of a tool worked by an electric battery under the guidance of hand by the means of which much beautiful carved silver work by Professor Herkomer, and that band of craftsmen now dispersed, was executed, among other things, the Badge and Chain of the President of the Royal Water Colour Society. I do not deny that such methods are liable to great misunderstanding, but the methods are here, and it is our duty as artists to improve taste and production by their means.

Amalgamation of Artists.—Another cause of the decline of art, and especially in its relation to architecture, as I have pointed out, was the separation of the artist from the Guilds. His withdrawal to himself became his own extinction. The want of co-operation of many individuals, each working in the same art, though in different crafts upon the same building, begat the clever draughtsman and the exploiting Execute Everything and Co., Ltd. For self preservation and for the sake of his art, then, craftsmen must band together. The metal worker who gives the spark of life and interest on the handles you grip when you enter the doors, or the electric fittings which light up the walls of the joiner and carver or the enrichments of the plasterer, is of no more or less importance to the whole than the decorator who has given you the poetry on your walls, or the silversmith who has adorned your table.

There must be no precedence but constant endeavour in the one craftsman that his work in his own material and artistic inspiration may not be unworthy to be placed alongside the decorations of his colleagues. To apply art to useful wares is not frivolity but a part of a serious business. Let us educate ourselves to be good workmen and competent judges of good work; this at all events will give us real sympathy with all that is worth doing in art.

It was to this absolute necessity for the establishment of Guilds of trade in an active and practical form for the purposes of ascertaining the principles of art proper to their business and instructing their apprentices in them, as well as making experiments in materials and newly-invented methods of procedure, that Mr. Ruskin referred to in his inaugural address at Cambridge in 1858. The responsibility for obtaining good work, he says, lies with you, gentlemen.

Use of Schools.—Another means to resuscitate art in its application to the building is by the proper use of schools. But, school learning, however practical, can only form a portion of the true education of the true craftsman. The late William Morris once said that to attempt to train a craftsman in a school is like trying to teach a boy to swim without water. The organised crafts must find the way by which the essentials of apprenticeship shall be obtained in the shops and in the works. The essential of apprenticeship is one association of the learner and a craftsmaster in *real* production. Problems of setting out and actual work should go hand in hand. All the technique of the crafts must be learnt in the shops. The schools at their best are only as books of reference to the scholar for information to be gathered to supplement the work done during the day in the shop, and this information should have direct bearing on his work.

Education which is not technical is not technical education. Education is technical only as far as it is directed to the training of the individual in and for his business in life. To give the same instruction to the young builder, the young jeweller, or the embroideress, is not technical education at all. It has nothing to do with his trade or industry.

The schools must be places for serious and responsible educational work; not places, as I fear at present in many cases, for teaching at playing or playing at teaching, but well organised, well disciplined institutions where the professional art student has no permanent sinecure or abiding. The day classes, if required, should be accessible to all by their cheapness, and its high standard, which exclude the incompetent.

The embryo architect—as my colleague, Mr. Bankart, suggested here in this room the other night—should devote his whole mind to becoming an artist in building, and should never lose touch in the school with actual handicraft; if you begin by studying one craft, you will end by studying many.

Training of the Architect.—Never make a design without understanding how it will be carried out, or you will give the workman unnecessary trouble, will lose the possibilities of the material or set him impossibilities.

Learn to handle the clay so as to learn the difficulties and impossibilities you often set the carver; you will then only be doing what your predecessors in the art of building did in the Middle Ages.

Express yourself in one art and you will do so in many; so did Giotto, the Pisani Brunelleschi, Bramante, and Michael Angelo; so did the great masters of the Middle Ages as Kraft and Vircher; so did Alfred Stevens, and more recently still—Morris.

Co-operation of Architects.—We artist craftsmen owe much to the energy and collaboration of the architects. The collaboration of architects helped much towards the success of the Art Workers Guild. A society which as you know was the means of bringing the late John Sedding into touch with many artists and prompted him to gather round him in his last great work—the Great Church of Holy Trinity, Chelsea—some of the foremost craftsmen of the day. It is due to this association that we are able to admire in this building not only this genius of Sedding, but the craftsmanship of Onslow Ford, Bate, Pomeroy, of Morris and others, all expressing Sedding's earnest endeavours and intentions to surround himself in his work with craftsmen of the best, though this design cannot be said to be complete since it exists without Sedding's main idea—the paintings of Burne Jones in the panels of the roof and the frieze.

Striking testimony to the truth of the utterance of Wm. Morris when, in the address he delivered at the Birmingham School of Art at the time that I was a student there, he declared that "we are not yet quite on the right road towards a satisfactory condition of art," and added that "when I say we I do not mean in this country in especial, for indeed at home here we seem better off than in other civilised countries," was borne at the International Exhibition of Modern Decorative Art, which was held at Turin, by the representative of Sweden upon the jury, who said that it would be a duty of the jurors to give special homage to the art of England—proposed that a grand and unique diploma of special honour should be created as an act of homage and thankfulness to this country for the inauguration of the Art Revival, and that this diploma should be entrusted to the Arts and Crafts Exhibition Society. But with all these efforts we have not yet arrived at the time when the craftsman and the craftsman's difficulties are thoroughly appreciated by the architect.

The architect even now forgets to stipulate that the decoration of his building shall necessarily come direct from the artists themselves—he even now not infrequently includes all his work in the contract of the builder. It is true, as Professor Lethaby says: The architect does not insert in his quantities "supply and fix one work of art," nor can he expect it, since often the builder in his turn seeks tender from those who accept his terms.

All this tends either to the absorption of the artist by the capitalist firms, or as is in our case, the amalgamations of artists for their own mutual strength.

I have now spoken too long, and, in conclusion, I would plead for your help for the craftsman. The only way to get good work is to make the artist and the craftsman feel you appreciate it, that you must have it, for your own buildings, that you will reject all other. Good work ought to delight you—the aim of art is to increase the happiness of men. In the mood of idleness memory amuses, in that of energy hope cheers, to satisfy that mood of energy is to employ it in producing something worth doing—a lively hope to the worker while he is executing, an absolute immediate pleasure in working—which is always present in the handiwork of the skilled workman finding his expression in his art.

Give a free hand to the craftsman—his special knowledge has only been rightly learnt by the experience of years in the particular work required. Certainly the architect must be one of the body of artists—there must be a real communion or common understanding between us all, but however clever the architect, it is impossible for him to do the whole of the building, however great the man. Though he may design, under present day conditions he cannot execute, and something of his genius must be in all the other members of the great body which raises the complete work. The craftsman has experienced the power of each treatment, and the difficulties connected with it. It is only by repeated touch and continual trial beside the forge and the casting tub that the designer will know the limitations of his art, the smith can master his materials and the modeller appreciate the difficulties of the moulder.

I am not advocating or suggesting that the craftsman is the pre-eminent factor in a building because such would not be true, but I do appeal to you that you architects should more and more design your buildings with the thought of their embellishment in your mind, and from the start afford us those opportunities which otherwise we are powerless to attain. It is only by earnest communion of ideas and source of opportunities which you can give us that we shall recover the threads of the glorious traditions of the past, and avoid the blatancy of much

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of that modern work whose origin and existence has been caused by the loss of architectural control through neglect in the past.

It is only by such opportunities that the sculptor, the metal worker, the plasterer, and the decorator will be tempted to throw off the academic spirit feeling the joy and the pleasure of his art being once more a living art co-existent with its surroundings not at all the caprice of the moneyed few in inharmonious and piecemeal settings, but living and forming the keystone of the whole, being the light of day itself. Then, with these opportunities and these experiences we should not hear the carping criticisms which so readily fall on men who, the slaves to their art, and under the greatest difficulties which modern builders place in their way endeavour to revive the glorious wealth of colour, richness and poetry which flooded those Renaissance streets. I have in my mind those two much criticised works of Alfred Gilbert—the Shaftesbury fountain and the Newcastle statue of Queen Victoria—both delightful conceptions of that great master of poetic fancy—full of the light and shade afforded by a masterful treatment of material, bristling with difficulties in their execution because of the lack of opportunities or sympathy in this cast-iron utilitarian, eager-to-say-smart-and-cutting-things country of ours.

Many men design themselves—Ruskin, in his address to you in 1857, said: "If you have genius you will yourself take the lead in the building of your design, but for all subsequent treatment you may trust to the agency and invention of others, and it rests with you either to repress what faculties your workmen have into cunning subordination to your own, or to rejoice in discovering even the powers that may rival you and leading forth mind after mind into fellowship with your fancy and association with your fame." My excuse for addressing you to-night is that as a craftsman—our business is to form the market as much as to supply it—as architects—yours to educate your clients to this market as much as to build for them, and I feel that I cannot express my thoughts to you half as forcibly as Mr. Aston Webb did in his last inaugural address but one to the Royal Institute of British Architects when he said—we rightly have a voice in the selection of the artists and the craftsmen who work on our buildings from the sculptor and painter who decorate them to the locksmith and upholsterer who furnish them. Great encouragement may be given to the subsidiary arts if we take the trouble to find out individual artists to work with us in the various branches of the applied arts, and while fully illustrating our intentions giving them sufficient freedom to carry out their imagination and inventiveness with their full share of credit. Depend upon it, great discouragement is caused to earnest workers, and much harm done if just to save time and trouble we take the first article of commerce which comes to hand.

Mr. Gilbert then showed some interesting lantern slides, which gave, he said, "an idea of the opportunities of the past compared with the opportunities of the present."

Mr. E. Guy Dawber said he had much pleasure in proposing a hearty vote of thanks to Mr. Gilbert for his paper, which was full of interest and thought, and which he regretted so few had attended to hear. He was in sympathy to a great extent with the views of the author, and he thought that the way in which Mr. Gilbert had traced the growth of craftsmanship from early times to the Middle Ages and down to its decadence—it might be called its decay—at the present day was very interesting. It had to be remembered that in the times Mr. Gilbert had been speaking about—and especially in the Renaissance times, when the beautiful things they had seen on the screen were made—there was no such word as "craftsmanship" in the sense in which we use it to-day. Every worker was a craftsman, and up to the end of the XVIIIth century, at any rate, all work that was produced in this country was craftsmanship. Whether it was the country mason doing a piece of walling, or the local blacksmith doing a set of hinges, or the glazier leading up a glass window, it was all craftsmanship, and to-day we were on an altogether different footing. Then another thing had to be recognised, *i.e.*, that as a nation we are an absolutely inartistic people, and, although the appreciation of beautiful things was increasing in England, it was a slow growth and at present was noticeable only amongst the cultured few. We had only to look at the electric-light standards which had been put up in that magnificent boulevard which was being made from Buckingham Palace into the Strand to recognise this. As a nation we cared nothing about artistic things. There was another point which Mr. Gilbert appeared to have overlooked and that was the question of cost which entered into the craftsmanship business. All buildings erected to-day for whatever purpose had to provide as much accommodation as possible for the outlay in money, and architects were placed in the position of having to supply as much accommodation as they could for the money; and to suggest that expensive craftsmanship, much as we should like to do it, should be put in these buildings was out of the question. To the majority of people architects had to deal with, the bulk of the things the craftsman produced were out of their reach, and, until craftsmen could produce artistic things for everyday use which could compete in price with the manufactured articles on the market, it seemed to him that the question of craftsmanship as regarded the ordinary every-day building was a difficult suggestion to put forward. Mr. Gilbert rather reproached architects for not designing their buildings with decorative schemes in view, but in the olden times, it must be remembered, architecture, painting and sculpture, and the allied arts all put into one building formed one concrete whole, and there was no such thing as separating the crafts as we do to-day. If we talked about painting and sculpture to people nowadays their thoughts were—in regard to painting, of easel pictures, and to sculpture, of a bust on a pedestal, and their idea of architecture was of a building which a number of paperhangers and decorators finished. It was a difficult matter to persuade people to put in their buildings the beautiful things that architects wished to see there, and it was difficult to persuade them that those things were an improvement. A great many people objected to things which architects and craftsmen considered beautiful and artistic. Still, the tendency of the day was towards a greater appreciation of the craftsman and his work, and the example that the Arts and Crafts Exhibition had set, and the influence they had had on the public generally, had been great, and he had no doubt that in a short time that influence would become greater. Architects were only too glad, when they had the opportunity, to welcome craftsmen to carry out work, and there was hardly any building of note by an architect with a reputation where the ablest craftsman had not been employed. Mr. Belcher, for instance, had drawn round him a body of craftsmen who carried out his ideas, but in the majority of instances cost prevented this being done. He was glad that Mr. Gilbert had not put forward that pernicious theory that they had heard recently in that room—that no one could be an architect unless he could actually make things with his own hands. That was a wrong view to put forward, especially before students. That a man should understand old work and do good work was very important, but it was not necessary that he should be able to make everything himself. The greatest architects had taken the best course; they had drawn a body of craftsmen round them to produce an artistic whole.

Mr. H. Longden, in seconding the vote of thanks, said it seemed to him that the tendency was for architects to gather a body of men round them who could do work in a way which they felt to be harmonious to their own general design, and who could also carry out work which the architect had designed. One of the best combinations nowadays was the architect who designed and the expert at his elbow. Some of the most beautiful things had been achieved in this way; the architect's was the guiding idea of what was wanted in a particular place. If they started making a design for a thing without knowing where it was going they were working, it seemed to him, in the air. When they knew they were going to work in a particular place, and that a particular thing was required, they had a much better chance of making a good thing than if they were working in "the air." The tendency of working together was increasing. Mr. Gilbert had mentioned Mr. Sedding's church at Chelsea and the fact that the architect drew around him so many craftsmen and inspired them as he did. Mr. Sedding had the gift of inspiring others so that they gave of their best. In that connexion he would relate a little incident. A man was making some ironwork for that church. Sedding went to the forge to see how the work was being made, and when he saw that the craftsman had exactly taken up his ideas and showed that he knew what the architect wanted—the architect's drawing was rough, but full of life, and the man had been able to appreciate it—he held out his hand to the man and said:—"Shake hands; that is just what I want." He (the speaker) did not suggest that architects should shake hands with the men, but he mentioned the incident in order to show that Sedding had a way of inspiring his men to do what he wanted. Craftsmanship continued much later than anyone would gather from Mr. Gilbert's paper. Within his (the speaker's) memory craftsmanship had been of the best. By the old training, by the system of apprenticeship, by the system of son following father, by a sort of heredity, the craftsman reached a state of excellence, and not only that, but he took great pride in his work. He did not see now so much of that pride as he used to observe on the part of the workman. Then, a man would more often do a good piece of work and look at it with pride and satisfaction, feeling that he had done as good as he could, and when told that the work was good he was thoroughly satisfied. Of course he had to be paid good wages, but really the wages paid then were much the same as the wages paid now. For a good workman, the wage then was nominally less, but in various ways the result was about the same in the early days as compared with the present day. The craftsmen were trained in the workshop, where they went as apprentices. They went through the whole thing, and were so trained at their work that what they did was put together in a durable way. Take an old fire-grate of the XVIIIth century. It was so made that it was generally found that, except for a little burning at the bottom or of the bars, it was as good as when made. That was the sort of work that used to be made down to quite recent times. But that was not so now. The idea now was to make things that went together by themselves almost; the old idea was that it should be wrought together and that it should last. Things made as they were nowadays lasted, say, twenty years, to say nothing of 100 years, and the craftsmanship in them had practically disappeared. As to craftsmen making artistic work, his experience was that a good plan was to get hold of a good workman trained in the ordinary way, at a particular branch of work, and then put before him the kind of work they wanted done. Show him drawings and old work and point out to him the things in the old work to be admired, and why they were to be admired. If he was a good man he would do good work and take a pleasure in it. There were schools for training craftsmen, and there was the London County Council school in Regent-street, where some beautiful things were made—bookbinding, stained glass work, silver work, and a little enamel. Good work was being done there, and in many cases these young people worked in the day at some workshop and went to the school at night, and with the teaching they got they greatly improved; but he did not believe in turning out craftsmen except after regular and steady work at a workshop in a straightforward way. They were not to be trained at technical colleges only; they must have the workshop at their back.

Mr. A. H. Belcher, in supporting the vote of thanks, said that one point which had struck him was that they ought to impress on the public the fact that if one wanted a good thing one must have it well made and not be afraid to pay for it. People liked what they bought to be good, and the object was to cultivate a knowledge of the fact that good things must be paid for accordingly, and then the love of the beautiful would follow. As to craftsmanship, he thought that if the actual work a craftsman did could be credited to him, and not only to the people he worked for, that that would be good for the work and good for the man. There had been exhibitions where the joinery work, the locksmith's work, etc., had been credited to the actual craftsman who did it, and he believed that that was a good practice, which ought to be encouraged, for when a workman's name was brought before the public in this way it encouraged him much. What Mr. Longden said was certainly true as to technical schools: they were no use by themselves. A man must work at his art in the actual workshop. The main remark he wished to make was that good things must be paid for, and the public must be made to understand

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that. Take a cottage building, for instance; the public must not be allowed to think that they could get a cottage for 250*l.*, when it would cost 500*l.*, and an architect should give up the task of producing a 500*l.* building for 250*l.*, when the attempt would result in the production of something bad. When a client found he had got a good building and value for his money, he would always trust the architect, who would never lose work by carrying out what he did in that way.

The Chairman, in putting the vote of thanks to the meeting, said he was sorry that they had had such a poor attendance that evening, because this question of craftsmanship was rather a burning one with a number of people, and it was a question which would bear a good deal of discussion. Some people thought that there was nothing else than craftsmanship in architecture, and that there was no such thing as an architect; that if a man made himself a craftsman that was all he need do, and that perhaps, by chance, he might become what was called an architect. He had heard it said that every architect should become a workman before he had anything to do with architecture; in his opinion that was absolute nonsense. It was absurd to train a man as a joiner or bricklayer, etc., and to think that then he could be an architect. A man so trained would be something of everything, all of which he would do badly. It was quite possible, for an architect, to understand all about the crafts without actually doing the work himself. Mr. Gilbert had given them a very interesting historical survey of the rise of craftsmanship, and the decay and decline of it. In the present day craftsmanship had been revived, and no doubt Mr. Gilbert was looking forward to the time when the craftsmanship of the Middle Ages might be re-introduced to its former position. That would be a very desirable thing, but he had a little complaint to make about craftsmen of the present day. Craftsmen had not picked up the tradition where it died out, and ever since the great revival, which all rejoiced in, they had all been working on what they considered and hoped were new lines. Craftsmen of to-day might have done better had they worked more on the traditions of the past, where those traditions had been left off, and had progressed from that point rather than to have struck out an absolutely new line which was quite away from almost everything which had been done in the past. Almost all the craftsmanship one saw now was totally different from the work which all our lives we had been trained to admire. He did not mean to deprecate for one moment the work which was done now; a great deal of it was excellent, and, in its own way, possibly quite up to the work of the Middle Ages; but he should have liked to have seen it taking up the old tradition rather more than it had done. He also thought that the craftsmen of the present day had created a Frankenstein which they would find it very difficult to deal with. The peculiar kind of art which they had been practising for some years had now got into the wholesale manufacturers' workshops, and the stuff that those manufacturers were turning out made one almost appalled at the idea of the thing. It was to be hoped that the leaders of the movement—the real artists that was—would progress beyond the point from which they had started. He supposed that from the craftsman's point of view the ideal way to carry out a building would be for the architect to design the carcass of the building, and then to call in a number of craftsmen, each in his own line, and to band them together, and hand over the decorative parts of the work, so that they might deal with it individually and collectively in their own way, giving them, in short, the freest possible hand. Theoretically that seemed a very fascinating idea. He had that idea put before him some ten years ago by one of the leaders of the craftsmen, who said that that was what ought to be done. At the time he thought so too, and said he would try it as soon as he had a chance. Before, however, that chance presented itself, someone else tried it, and the result was an absolute failure; everyone of the craftsmen had gone his own way without caring anything about the rest of the work. What had been said as to cost and the expense of really good things was, of course, perfectly true. A good thing, and a thing which had cost a man much thought and labour, had to be paid for at its proper price. But ordinary articles of commerce, which we were bound to use in every building, might be made beautiful in design, and yet at a price which would be within the reach of everyone, and he could not see why this should not be so. If we could only get the wholesale manufacturers to produce these things it would be found that the beautiful forms would not be more expensive than the ugly ones. Anything of a special character, however, that would take time and thought in the production, must, of course, be paid for accordingly.

The vote of thanks having been heartily agreed to,

Mr. Gilbert, in reply, said there was nothing new in the paper: it was only a reiteration of thoughts of different people who had dealt with the subject before. The question of cost was a serious one, but there was no reason why the artist should not take up and be master of the machine and of the mechanical productions. There was no reason why the stamping process should be in the hands of a wholesale manufacturer, who only thought of turning out so many gross of this or that. The artist could be just as well the master of these processes of production as the wholesale manufacturer. The medals he had referred to were sufficient to show that machine production had a beauty of its own, and there was no reason why the ordinary articles which were used all over a building should not be produced in the same way. As to the collaboration of the architect and the craftsman, nothing was farther from his mind than to suggest that the craftsman should have a free hand altogether. The architect who designed a structure naturally wished to see it right through; but, on the other hand, he did not see how the architect could give full-size drawings of the plaster details or the metal work, etc. The architect, therefore, should be content to give the man who was going to execute such work a free hand to suggest, and then, under the approval of the architect, who had the whole scheme in his mind, to carry out the work.

The Chairman announced that the next meeting will be held on May 6, when a paper will be read by Mr. A. E. Munby on "The Value of Science in our Architectural Curriculum," with practical experiments.

The meeting then terminated.

A RAMBLE IN SHAKSPEARE'S LONDON.

UNDER the able guidance of Mr. T. Fairman Ordish, F.S.A., founder of the London Shakspeare League, a large and manifestly appreciative party visited, on Saturday last, several places associated with the poet's residence and career in London. After inspecting the exhibition of Shakspeariana at the British Museum, they went to St. Leonard's, Shoreditch, which may be called the "actors' parish," and saw the registered entries of the burials of Richard Tarleton (1588), the supposed original of Yorick in "Hamlet"; James Burbage (1596), the first builder of playhouses in London; his son Richard, a leading performer in Shakspeare's plays, and other famous players. They then went to the site of the Theatre built by James Burbage, the first of its kind, a round wooden house, and open at the top—at the left hand of one passing northwards through King John's-court out of Holywell-lane, Shoreditch—and the adjacent site of the Curtain in Hewett-street, originally Curtain-court; the actual spot, within the precincts of the dissolved Holywell Priory, is plotted in Peter Chassereau's survey of the parish, 1745. The latter playhouse derived its name from the land outside the priory gate, on which it stood; and there, in the opinion of Mr. Halliwell-Phillips, were first acted "Romeo and Juliet" and, at Shakspeare's intercession, "Every Man in his Humour." Then, after visiting St. Helen's Church and Crosby Hall, the company made their way to the Guildhall to see the original copy of Aggas's map and the deed bearing the poet's signature of conveyance to him of the house in Ireland-yard, Blackfriars, which he left by will to his daughter, Susanna Hall. Proceeding to Aldermanbury, where, in the former parish church, were buried John Heminge and Henry Condell, brother actors of the poet and first editors of his collected plays in the folio of 1623, they continued to Eastcheap, passing King William IV.'s statue, that marks the site of Mistress Quickly's tavern, the Boar's Head, and so to Southwark. At St. Saviour's are preserved the Communion-token books in which are entered the names of some sixteen of the actors enumerated in the first folio as having performed in the plays; the registers were courteously exhibited which contain record of the burials of the poet's youngest brother Edmund, "a player" (1607); Laurence Fletcher, his fellow in the Lord Chamberlain's company (1608); Henslowe, the manager; John Fletcher; and Phillip Massinger, "a stranger." In the Liberty of the Clink, on Bankside, so largely connected with the early history of London theatres, were pointed out the situations of the Globe, by the southern end of Horseshoe-alley, Park-street; the Rose, Henslowe's and Alleyn's theatre, in Rose-alley; and the Bear Garden (afterwards the Hope Theatre), in Bear-gardens, near which Shakspeare lived on removing from St. Helen's, Bishopsgate. A long programme, yet replete with interest throughout, concluded with visits to Playhouse-yard, the site of the Blackfriars Theatre, in which Shakspeare often acted; Middle Temple Hall, wherein "Twelfth Night" was performed, as the student Manningham's diary testifies, at the Readers' feast on February 2, 1601-2; and to Gray's-inn, in the hall of which the "Comedy of Errors" was acted as part of the Revels in 1594, and the memory of "good Queen Bess" is solemnly toasted on Grand Day in each term; and where, in the garden, still lives a catalpa tree planted by Francis Bacon.

THE SURVEYORS' INSTITUTION:

LONDON STREETS AND STREET TRAFFIC.

AN ordinary general meeting of the Surveyors' Institution was held on Monday last week, at No. 12, Great George-street, Westminster, S.W., Mr. A. Buck, President, in the chair.

The minutes having been read and confirmed,

Mr. J. C. Rogers, Secretary, read a list of donations to the Library and the Library Fund, and, on the motion of the Chairman, a vote of thanks was accorded to the donors.

Mr. Rogers also read a list of names proposed for the new Council for the ensuing year. Mr. H. T. Stewart will be the new President.

Mr. Thomas Blashill then read a long paper on "London Streets and Street Traffic," in the course of which he said we do not want a new London, however well laid out; probably not many districts require to be rebuilt, and he was sure that we do not want half nor a quarter of the new streets through old neighbourhoods that some enthusiastic projectors have indicated We want first of all the removal of obstacles. For a long time back the population of London had gone on doubling every forty years. In some such period a new generation became weary of the increasing pressure of the traffic, which in certain places grew four times as fast as the population, and anxious to try some new remedy of its own. It happened nearly forty years ago that, upon some such periodical awakening of public sentiment, he had the privilege of assisting his friend Colonel Haywood, then the engineer to the City Sewers Commission, in the inquiries which resulted in his report of 1867 to the Court of Common Council on the Traffic and Improvements of the City. That report had influenced all succeeding investigators and projectors. Among the considerations in that report was the question how far modern arrangements for facilitating traffic met the increase in its volume. And it appeared that, however great the temporary benefit might seem, the effect of all such arrangements quickly disappeared, and within a very short time the crowding was greater than before. Indeed the things which might seem to render such crowding less necessary, by facilitating business greatly increased the throng. Cheap postage and the telegraph were then fairly developed, but the necessity for transacting business in person had caused the traffic to outgrow all former records. He believed that more recent experience confirmed this evidence. Since Haywood's report the following important works for facilitating the traffic in Central London had been carried out:—The Holborn Valley Improvement, Queen Victoria-street, the Victoria-embankment, Shaftesbury-avenue, Charing Cross-road, Clerkenwell-road, Rosebery-avenue, the Tower Bridge, widening and extension of Eastcheap to Tower Hill.

The Tower Bridge was first advocated by Haywood. Its approaches were, however, much less developed than he desired; but all the other schemes were complete and answering the purpose for which they were expressly designed. Nor was this all. The "Inner Circle" had been completed by the formation

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of the District Railway, which had an enormous passenger traffic, and the Tube railways were carrying their hundreds of thousands—all this without much noticeable effect on the traffic of the streets, indeed, the overcrowding of particular thoroughfares and the blocks at crossings were worse than before.

Among the remedies that suggested themselves he had put the removal of obstacles in the first place. Whatever we might say about the subsoil, the surface of the roadway did not belong unconditionally to the frontager more than to anyone else. It did not belong to the ratepayers as such, nor to the local council whose duty it was to take care of it and keep it clean; and whatever works the local authority might have to execute upon it, they were bound to bear in mind that it was dedicated to the general public and not to those of their locality alone.

Beginning with the highway itself, we might notice the way in which streets were constantly being broken up by the companies who had acquired powers in respect of underground pipes, and by the borough councils for repaving and for work to sewers. The companies were bound to give notice to the local authorities except in cases of emergency, but it was stated that in the thousands of cases per annum upon which in every metropolitan borough they interfere with the roadway they never gave any notice, and as the authorities would have no power of refusal the companies might consider that no useful object would be served by a compliance with the law. He was not sure that there was any remedy for this sort of empowering the borough councils to do all the work on the roadways and to charge the cost to the parties concerned. And that might be the beginning of a reform that we might hope to see in the system of carrying on works in the public ways. All such work in important streets should be carried on continuously, night and day, by three gangs, say, their hours and wages suitably arranged, sheltered when necessary from rain and snow, whether they were working for a company or for the public authority.

He saw the first experimental specimens of modern street pavements put down, and he hoped to see the last of the old granite which they are superseding. Whatever the respective merits of wood and asphalt they had this in common; each was laid on a permanent foundation, each was, in fact, a wearing surface to the permanent road on which it was laid. If he were an inventor he should look out for some material for covering a permanent foundation by a thin layer that could be applied or renewed in a night without disturbing the traffic; something that would form a tough elastic skin rougher than asphalt under the hoof—if horses were still to be used—and smoother than wood under the wheel. One could easily imagine such a renewable skin that would keep the traffic from contact with the pavement beneath.

Upon the footway of this road dedicated to public use the shopkeeper projected his counter and stood outside serving his customers. Upon the carriage-way small traders sought their livelihood and costermongers set up their stalls, the police being advised that their power over these obstructions was doubtful. But, if doubtful, they might reasonably get its legality settled by the proper tribunal. When one of our borough councils found courage to take a case before a magistrate they were successful, and some of their main thoroughfares were cleared and restored to public use.

Besides such wholly illegitimate occupations of the highway, there was a much more serious obstruction by the frontager whose vehicles were for a great part of the day loading or discharging in front of his warehouse or loitering about awaiting their turn. In the narrow streets of Genoa the old palaces have each their indoor court, stone-paved and devoted to all external traffic, and it seemed reasonable to suggest that people who needed the exclusive use for long periods of room for loading should provide them on their own ground. Perhaps an indoor space of a hundred feet superficial that would accommodate a horseless vehicle would answer every ordinary purpose.

This consideration suggested the question whether factories or even warehouses were rightly placed in the central and more crowded parts of London, to which a vast multitude of persons not at all concerned with business of that class must frequently resort. This applied most forcibly to factories which got, not only their materials, but their workpeople by hundreds from outside the Metropolis. Many of these factories could be very beneficially removed to the locality where the workpeople had gone to live, and this was slowly being done. But to decrease the burden of London traffic it was not necessary to get rid of London occupations or of the Londoner. There were large districts in a middle ring round Central London where buildings of all kinds were worn out and squalid and ought to be replaced, some by better residences and some by such factories as could most conveniently be retained near to the centres of business, the workpeople being drawn largely from the families that must live near the same centres. As to warehouses where goods were stored in bulk for sale, it was very questionable whether all this was really necessary. Could not something more be done by selling wholesale from samples and delivering the goods direct from the distant storehouse or factory so as to avoid carriage both ways and costly storage in Central London?

There was room for vast improvements in the modes by which the enormously heavy market traffic was carried on. Smithfield Market stood over a network of converging railways by which it was expected to receive its supplies, but only the Great Western made use of that convenience for its traffic. The great bulk of the dead meat brought to market still came by railway vans through the streets. The great roads entering London and also the inner streets were still thronged by vans and carts resorting from distant places to the very few centres where markets exist, Covent Garden and Spitalfields Markets blocking the main streets in their vicinity. There might have been some recent improvements, but there was great and ever increasing need for the establishment of new wholesale markets near to railway stations and accessible from the great roads. In Germany, the most modern market arrangements have been adopted. All such towns had their cattle stations with lairs and markets in the outskirts connected with abattoirs in which were spacious halls for the different kinds of animals. There the whole of the processes involved in preparing the meat for the retail markets and the butchers' shops were carried on without the least offence. Nobody would guess that the handsome buildings standing in their clean courtyards were used for their actual purpose. No animal could be killed and no dead meat could be brought to these towns except at those depôts.

They were not concerned with questions as to the proper authorities for supplying these and other important public requirements so long delayed, but if the movement towards decentralisation went on as slowly in other respects the congestion of traffic in Central London would be intolerable. Following the directions in which all classes had been spreading outwards, the great retail business establishments, the branch banks, churches and chapels, hospitals, theatres, and all places of amusement, everything that must keep in touch with the people might be found in the nearer and the outer suburbs, giving to many of the new centres the accommodation and the appearance of populous country towns. As public institutions, like the Post Office and the Fire Brigade, had obeyed the same instinct, we might live in hope. And when in the near future we had the option of talking to friends and to tradespeople and to City agents over the wire without leaving our own houses, the busiest amongst us, and the idlest, and the feeblest, and all who need not encumber the routes to the greater business centres would make room for those who must.

There were classes of vehicles obstructive to all other traffic. Steam traction engines were getting more common, as they would convey heavy loads at half the cost of haulage by horses. While legislation had been proceeding rather deliberately with the question of light railways, some genius seemed to have discovered that by omitting the flange from the wheel a train of wagons might be drawn upon the public way. At present the largest number so combined was three, but that was probably due to the moderation of the owners. It was difficult to imagine anything more obstructive to ordinary traffic or more likely to cause alarm to horses. Amongst obstructive vehicles we must class the tramcar, which, however convenient it might be to those riding by it, was quite unsuitable in crowded thoroughfares not specially designed for such traffic. The tramcars really required a central landing at each stopping place and in many cases police assistance for the safety of passengers. The rails were a source of danger to ordinary vehicles, and they very greatly obstructed driving in crowded thoroughfares. Having spent much time in tramcars in this country and on the Continent from their introduction more than thirty years ago, he thought they ought not to be extended in our streets, which were becoming more crowded than ever with ordinary traffic and more obstructed than ever by refuges and lamp standards. But we were probably approaching a time when cars would be run more cheaply without rails. Among the obstructions by special traffic, that which was due to the crowding of cabs on the routes to railway stations for particular trains was one of the most important. The electrification of short lines of railway would soon be copied by the longer routes. It appeared that on the new system each carriage would be provided with its separate motor, and when that came to pass there would be an end to the necessity for long trains. Long trains were due to the discovery that the wheels of an engine would take such hold on the rails that a number of carriages might be drawn behind it as had already been done by horse traction. When we adopt the principle of "one carriage one motor" the carriages might follow each other at intervals on our longest routes just as one tramcar followed another in the street. The railway carriage of the future would be self-complete, with buffer compartments holding luggage fore and aft, and there would no longer be a chance of great catastrophes from the "telescoping" of many carriages. As a matter of convenience, three or four carriages might be combined into a train sent off for Liverpool or Aberdeen every quarter of an hour. But time-tables would become almost superflous. One would drive to the station not at the time fixed by the company but at one's own time, and take one's place in the next available carriage. That would have its effect on the traffic of the streets. We were still suffering—after seventy years—from the timorous steps by which the great railway companies first approached London, halting at such remote places as Chalk Farm and Nine Elms and Bricklayers' Arms and Shoreditch. Had they waited a few years each one would have placed its terminus on the side of London furthest from its line and picked up its passengers *en route*. Ever since they were thought to have actually come into touch with the Metropolis they had been struggling to get nearer the great centres. When this maze of underground railways now under construction became organised into a system one would not drive to Euston or to Cannon-street or Victoria, or even to Moorgate-street, but would drive, or more probably walk, to some neighbouring underground station and find a long distance train line carriage that would pick up its local passengers and take its proper place in the continuous procession along the main line. And what happened with passengers would happen with goods, the receiving offices for which ought to be at many stations on the system of underground lines, from which they would be sent without encumbering the streets.

With regard to moving vehicles, or such as were supposed to be on the move, we had arrived at a time when new conditions must enter into any consideration of the future. A motor cab obstructs little more than two-thirds of the length of cab and horse, and so with the motor victoria and landau and omnibus and tradesman's cart and van. When these vehicles became so numerous as to dominate the traffic the speed of all vehicles using principal streets would be fixed at a rate uniformly high, and all slower vehicles would be turned into side streets. From his own observation there were very few roads which, except at crossings, would be insufficient for their traffic were it not for the mixture of slow with quick traffic. If every vehicle were now decreased in length by one-third, the capacity of every street would be practically increased in nearly that proportion. There would be no struggle to pass, as the need for one vehicle to pass another was due to the difference in the pace of horses and the difference in the weight of their loads. With motor traction, light and heavy traffic, subject to a few exceptional loads, would go at the same rate and use the same track. They were not concerned with streets of ample width where quick traffic could go its own pace, but with crowded streets where even the quickest traffic went not faster than an average of six miles an hour and probably not faster than four miles, while the slow traffic went rather under three miles an hour.

But whatever might be said about delays

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and facilities in respect of ordinary street traffic, that which forced itself most into prominence was the obstruction caused at the crossings of important thoroughfares. There might not be very many places where one was liable to be delayed for more than half a minute, but a distinct period of stoppage was easy to recognise, though it was probably of less real consequence than the continuous delays along the ordinary route. The most obvious way of facilitating the crossing of two streams of traffic was to marshal the vehicles in two lines, and thus to reduce the length of stoppage by one-half. If the delay was still too great something further must be done. A considerable number of vehicles moving north and south with others moving east and west upon an open plain would pass without any sensible delay, by spreading out so as to take plenty of room and by some little skill in driving. The nearest approach we could make to this condition was the formation of a circus, like St. George's-circus in the Borough, and Piccadilly-circus and Oxford-circus. This idea was adopted by Haywood at Holborn-circus and afterwards at Ludgate-circus. At the first of these there was never any obstruction, but at Ludgate-circus, which was obstructed by monuments and other obstacles, the crossing traffic was much more serious, and called for some further remedy.

Another great remedy applicable to all the over-crowded crossings was the dispersing of the traffic by the provision of new routes or the greater utilisation of existing streets for particular classes of vehicles. There were many lines of thoroughfare little used along which slow traffic might be directed, and there were useful routes by which omnibus traffic might travel instead of concentrating at a few points and actually creating this particular kind of obstruction. Indeed the great principle to be kept in view was the dispersing of traffic so as to prevent its concentration at a few spots. It was only when all such plans failed that one turned to the more serious expedients of new thoroughfares, and the bridges and tunnels which were so easy to suggest and so difficult to adopt.

The district lying between the Thames and the great boulevard formed by the City-road, Euston-road, and Marylebone-road, and extending from St. Paul's on the east to Kensington on the west, would supply the few cases which seemed necessary for illustrating what he had to say. If our royal parks within this area were in any large continental capital they would be the resort of parties of pleasure and crowds of all classes, attracted partly by games for the children, refreshment rooms and concert halls for the elders, and the music of many bands. From Kensington on the west to Whitehall on the east there was a length of three miles—chiefly park and garden—with only one unrestricted route across it, that by Park-lane and Grosvenor-place. If we might not make a new road across Hyde Park or improve such road as exits—there would be no difficulty in forming a tunnel under it or under Kensington Gardens for the relief of the traffic at Kensington, at the Marble Arch, and at Hyde Park Corner. He was not sure how a road from the space in front of Buckingham Palace across the Green Park and Piccadilly, as far as Curzon-street and beyond to Grosvenor-square and Berkeley-square, would affect the amenities of the King's palace and the new arrangements thereabout, but it would be convenient for the traffic, and the levels would allow of its being carried by a tunnel under Piccadilly, greatly to the relief of existing routes. There seemed no reason why all the traffic going by Regent-street and Pall-mall towards Westminster should go round by Whitehall, which with all its width was overcrowded. A carriage-way could be formed passing in two branches on each side of the Duke of York's Column on to Storey's-gate and to Victoria-street. He would assume that the new Kingsway would fulfil all present requirements of the north and south traffic between Holborn and the Strand. With regard to the east and west traffic south of Holborn and Oxford-street two or three routes needed to be formed, chiefly by utilising existing streets. A very useful thoroughfare might be made in relief of the Strand by widening the line of Chandos-street and Tavistock-street as far as Kingsway. A very useful tunnel, easy to make, had been suggested by Sir John Wolfe Barry to take a portion of the traffic from Knightsbridge to Piccadilly at the western angle of the Green Park. Other suggestions had been made of a road in relief of Piccadilly, to go the length of the Green Park to a junction with Pall-mall. No doubt the addition of a large amount of general traffic to that of Pall-mall would diminish the comfort of those who resort to that thoroughfare, but if no one was to be put to inconvenience, and no important building was to be removed, it was hard to see how the difficulties of London traffic were to be diminished.

The main line of Piccadilly, extending by Coventry-street and Long Acre to Lincoln's-inn-fields, must form an important portion of any improved route towards the city in relief of the line of Oxford-street and Holborn. Arrived at Lincoln's-inn-fields one might contemplate the obstacles which old and new structures combined to place in the way of improved routes for traffic. An autocrat would make an example by driving a road through that Inn of Court to the wide part of Holborn near Gray's-inn-road, or to Holborn-circus. The Holborn-viaduct, a route never blocked or overcrowded, would take this traffic and transmit it to Newgate-street, which, however, we knew to be quite inadequate for that which it already had. To remedy this block which continued through the City, Haywood, about 1865, proposed a new street from St. Sepulchres Church to run north of the Guildhall as far as the Whitechapel-road. Everybody had spoken well of it. Some projects embody it, but no steps had been taken to carry it out. Since 1865 many obstacles in the shape of important buildings had been rising in its path. It would have taken all the through traffic clear of the busy city streets, and would have facilitated access to the city very materially at many points. Moreover the proposed route from Holborn-viaduct to the Whitechapel-road would have been shorter by one-fifteenth of a mile than the route by Newgate-street, Cheapside, and Cornhill. There was at the present moment an opportunity for making a beginning. On the vacant land of the Christ Hospital site, now about to be shared by the Post Office and St. Bartholomew's Hospital, a part of this proposed road might be made so as to divide the Post Office land from the Hospital land, giving and taking where necessary, as the hospital is about to be rebuilt. The route could easily be carried as far as Little Britain, and on to Aldersgate-street, which would be one-seventh of the whole line, and an exceedingly useful thoroughfare in itself. Then we should come to property extremely costly, consisting of city warehouses as far as Moorgate-street, city offices as far as Bishopsgate-street, and the closely-packed quarter which needed to be opened up between Bishopsgate and Whitechapel-high-street.

Failing this route, so near to business centres, he suggested as worth consideration a line somewhat further north. Starting from Holborn-circus it would go down Charterhouse-street, the gradient of which was excellent, being 1 in 45, and, crossing the Farringdon-road, would proceed along the north side of the Corporation Meat and Poultry Markets, striking the line of the Metropolitan Railway at Aldersgate Station. Then the road would be formed above the railway at the level of the streets by Moorgate-street through Finsbury-circus, and would leave the railway at Bishopsgate Station, going straight to the Whitechapel-road, as before-mentioned. That scheme would involve the reconstruction of three Metropolitan stations and, for the public advantage, would place the railway line in tunnel, just as the greater part of that line was originally put in tunnel for the advantage of the railway company. The length from Holborn-circus to Whitechapel would be a mile and two-thirds, which was exactly the same length as the route by the Post Office and the Bank. It would pass in front of the Broad-street and Liverpool-street Stations, would relieve all the streets on the north of the City, and might lead to a better direction of the northern traffic towards the Tower Bridge. It would be of ample width for its traffic; while the existing route was so over-crowded that through traffic ought to be forbidden. But, before forbidding the passage of vehicles where they require to go, some such substitute as he had indicated must be provided. As to traffic north and south through the City, what he thought should be done was to reduce the height of Southwark Bridge as much as possible, and get the advantage of a foot or two feet at Upper Thames-street. Then form a new route in tunnel on the east side of Queen-street passing under Cannon-street, Queen Victoria-street, and Cheapside, and rising to the level of Gresham-street. If no more should be done at first than to widen Gresham-street and the bit of Lothbury, to a junction with Moorgate-street at the northern corner of the Bank, there would be formed a good route rather shorter to the Elephant and Castle than that by London Bridge, and with gradients better throughout than the existing gradients of Southwark Bridge. He doubted if there would now be any block of traffic at the Bank, were it not for the great number of omnibuses. If these new routes should be made, the omnibuses going east and west might be invited to go by the new northern route, or by Cannon-street, and those going north and south might be turned from Moorgate-street towards Southwark Bridge.

Mr. Blashill subsequently dealt with the traffic of Oxford-street and Holborn, and the densely-populated districts on both sides. The crossing-places should be made more numerous, and the omnibus should traverse these neglected areas. South of Oxford-street there is a great district of mean streets between Regent-street and Shaftesbury-avenue, in which a line of thoroughfare running northward to Oxford-street opposite to Great Portland-street would be a very useful improvement, relieving the traffic of Regent-street and at the crossing of Oxford-circus. For the relief of the traffic crossing of Oxford-street at the Tottenham Court-road, a new line of main street might be made from Cambridge-circus by way of Soho-square, crossing Oxford-street near to Rathbone-place, and proceeding northward parallel with Tottenham Court-road across the Euston-road as far as the Cobden Statue, or beyond. There would be no serious difficulty in making this new route dip under Oxford-street and also under the Euston-road, so as to prevent crossing the traffic of those crowded thoroughfares. From this new road a branch might be taken to run to the Portland-road Station. He had a strong opinion that the Midland Railway, which was on the high level, ought to run over the Euston-road and through the district due south, crossing over or under Theobald's-road, and over or under Holborn, to a terminus on the north side of Lincoln's Inn-fields.

Mr. Daniel Watney moved a hearty vote of thanks to Mr. Blashill for his paper, and, on behalf of Mr. Howard Martin, he also moved the adjournment of the discussion.

Mr. T. M. Rickman seconded, and the motion was agreed to.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A meeting of the members of the Association of Municipal and County Engineers was held in the Town Hall, Great Grimsby, on Saturday, April 23. The meeting brought together a large gathering of members, among those present being the President (Mr. W. Weaver, C.E., of Kensington), Messrs. C. F. Wike, Sheffield; A. D. Greatorex, West Bromwich; J. Lobley, Hanley; A. E. White, Hull; E. P. Hooley, Nottingham; W. H. Hopkinson, Keighley; E. Rushton, Cleethorpes; J. Clare, Sleaford; T. Henry, Retford; J. W. Cockrill, Great Yarmouth, hon. district secretary; and others.

The Mayor (Councillor Bannister), presided at the opening of the meeting, and heartily welcomed the Association to Grimsby.

Alderman G. Doughty, M.P., spoke of the progress of Grimsby in recent years. He remembered Grimsby when it had not many more than 12,000 inhabitants; now it had 70,000. He believed they were on the threshold of the greatest development of any town on the East Coast—the construction of a deep water dock at Immingham. The Bill had passed the House of Commons, and in the case of an enterprise of that kind he could not conceive serious people who had spent thousands of pounds in fruitless opposition in the House of Commons, going on with the opposition in the House of Lords.

The President thanked the Mayor and Corporation for the cordial welcome given to the Association. The proceedings were then adjourned, the Mayor entertaining the members to luncheon in the banqueting chamber.

On resuming, the President took the chair, and expressed his pleasure in meeting the members of the Eastern Counties.

On the proposition of Mr. Wike, of Sheffield, Mr. J. W. Cockrill, C.E., of Great Yarmouth, was unanimously re-elected honorary secretary for the Eastern Counties district.

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Municipal Works of Great Grimsby.

Mr. H. Gilbert Wyatt, Assoc.M.Inst.C.E., Borough Engineer and Surveyor, presented a paper on the municipal works of Great Grimsby. He described it as the largest county borough in Lincolnshire, and not as stated in a London newspaper on the occasion of the fishing dispute two years ago, "a small fishing village on the Yorkshire coast." The town is very flat, and the greater part of it is only a few feet above the level of ordinary spring tides. Probably one-fifth of the town does not lie more than one foot above tide level, and, speaking generally, in that portion of the town which has already been built, there is not more than 7 ft. difference in the levels between the lowest and the highest parts. The area is 3,120 acres, the population 63,138, living in 13,330 houses. Assessable value for poor rate purposes (which includes borough and education rates), 254,881*l.* The death-rate for the year ending December 31, 1902, was 15·294 per 1,000, with a zymotic death-rate of 2·213. These figures show that Grimsby ranks amongst the healthiest towns in the country. There are about 43⅝ miles of highways and dedicated streets in the borough, and about seven-eights of a mile of private streets which have not been taken over. The whole of the roads in the town are macadam. The Private Street Works Act, 1892, has been adopted by the Corporation, but it is very seldom put into force. The author has only made four provisional apportionments during the period he has held office at Grimsby; of these only two have been carried out, and each of these cases was a back street 12 ft. and 14 ft. in width. There are probably two miles of streets and roads in Grimsby in which trees have been planted. In view of the nature of the soil, and its proximity to the sea, there are not many trees suitable for street planting. Those which stand the climate best are: English elm, sycamore and lime, red-twigged. The tramways in Grimsby are in the hands of the Great Grimsby Street Tramways Company under a lease of twenty-one years from July 21, 1900. The company agrees to pay to the Corporation for way-leave the sum of 1,000*l.* per annum for the first five years; 1,250*l.* per annum for the next five years; 1,500*l.* per annum for the next three years; 1,750*l.* per annum for the next three years; 2,000*l.* for the remaining five years, making a total of 30,000*l.* for the twenty-one years' lease. The Corporation supplies the whole of the electricity required at a charge of 1½d. per Board of Trade unit for the first 360,000 units used during each year; 1¾d. per unit for the next 100,000 units, and 1½d. per unit for all current used in excess of 460,000; and it is also provided that the company shall pay the Corporation for the first 360,000 units whether such quantity shall or shall not have been actually supplied to or used by the company. The company also repair the paving between, and to the extent of 18 in. outside, the tramlines. The total length of road on which tramways have been laid is 4¼ miles, there being 2 miles of double lines and 1⅞ mile of single line, with ¼ mile of passing places, making a total of 6¼ miles of tramway on the 4⅛ miles of road. There is no sewage problem in Grimsby except when the sewers are overcharged with storm water, and at such times small areas of the town are flooded to the extent of a few inches. The sewage is discharged without any treatment into the Humber. Prior to the erection of the pumping-station, and as a consequence of the low level of the town, the original sewers of the town were laid at a very shallow depth, and, the ground being saturated with subsoil water, cellars were not as a rule constructed. An ordinary flap valve was placed at the sewage outlet, and for a certain period during every tide, that is, twice in each twenty-four hours, the sewers were compelled to act as elongated reservoirs of sewage. As the town extended, the quantity of sewage became greater than the reservoir room, and it was found necessary about 1890 to construct deep sewers through the town and to build a pumping-station. The scheme was very well laid out, the works were constructed in the best possible manner, and up to the present the writer has not found anything which he could mend. Trial openings were made some two years ago in various parts of the town to ascertain the condition of the sewers and the writer was able to report them as being in perfect condition. The pumping-station was designed by Mr. Marshal Petree Assoc.M. Inst.C.E. (the author's predecessor and a former member of the Association). The invert of the main sewer at this point is 3·20 ft. below ordnance datum, and ordinary spring tides rise to 10·33 above ordnance datum. Pumping is commenced three and a-half hours before high tide, that is, when the tide reaches the level of ordnance datum, and continues until three and a-half hours after high tide, by which time it has again fallen to that level; the ordinary maximum lift being, therefore, between 13 ft. and 14 ft., and the duration of pumping seven hours out of every twelve and a-half. The pumps are centrifugal, 18 in. diameter, and were constructed so as to be capable of dealing with 600,000 gallons per hour. Owing to the flatness of the town, continual flushing of the sewers is necessary, and in connection with the pumping-station an elevated tank containing 90,000 gallons was constructed which is filled twice daily by subsidiary pumps. From this elevated tank a system of water mains is laid through a large portion of the town, and the water is used for sewer flushing, street watering, and similar purposes. The gas supply is in the hands of a private company; the price being 2s. 5d. per 1,000 cubic feet.

The water supply is also in the hands of a private company. The supply is derived from artesian wells sunk into the chalk; is ample in quantity and excellent in quality. The water is somewhat hard being 10·10 degrees on Clarke's scale, but the hardness is chiefly temporary, 14·35 being removed by boiling. A committee has been formed by the Town Council for the purpose of making inquiries as to the advisability of acquiring the water-works, but their deliberations have not yet taken the form of a report.

The public lighting is done in three portions. About 3⅛ miles of streets are lighted by electricity from the Corporation's own electricity works; the number of lamps is eighty, being Gilbert's arc lamps—some 10 ampères and some 6 ampères. The electricity committee supplies the lamp-column, lighting, extinguishing, cleaning, repairs, carbons, painting of lamp-column, etc., at an inclusive charge of 1¾d. per hour for the 10 ampère arcs, and ·85d. per hour for the 6 ampère arcs. Half the lamps are lit 3,637 hours per annum, and the remainder, being extinguished at midnight, for half this time. The remainder of the town is lit by two gas companies; all the lamps having been converted within the last twelve months into incandescent mantles. One company has 770 street lamps in use, and the charge is 3*l.* 12s. 9d. per lamp for 3,802 hours; this price including lighting, extinguishing, cleaning, mantles, repairs, painting column, etc. The other company has 144 street lamps, and the inclusive charge is 3*l.* 19s. 2d. He was informed by the manager of one of the companies that they estimate to use twelve mantles per annum. The lamps are lighted all the year round from sunset to sunrise. The Corporation expends about 750*l.* per annum in cleansing street gullies, and gullies under slopstones and sinks on private property. There are about 26,000 gullies in the town, and of these about 17,000 are emptied by means of scoops about five times per annum, being filled with water immediately after being emptied. It is unfortunate that the local name for these gullies is "cesspools," and occasionally papers outside Grimsby call public attention to the fact that there are 20,000 "cesspools" in the town; the fact being that there are not more than half-a-dozen altogether, and the term refers to ordinary trapped gullies. It is possibly a question as to whether this cleansing ought to be done at the ratepayers' expense; but, on the other hand, if owners were compelled to put in self-cleansing gullies, the sedimental matters would be washed into the drains and thence into the sewers, resulting in the necessity of a greater expenditure on sewer flushing; the expenditure on gully cleansing is not only good, from a sanitary point of view, but is probably economical. The question of the disposal of household refuse had been a cause of considerable anxiety to the Corporation for a long time, and the erection of a destructor, for the purpose of disposing of the refuse in a more sanitary manner, had been talked about for nearly ten years before it actually came to pass. A specification was prepared for a 4-cell destructor, capable of burning forty tons of refuse per day, and tenders were invited in April 1901; that of the Horsfall Destructor Company for 8,507*l.* 11s. was accepted, and application was made to the Local Government Board for sanction to borrow 10,500*l.*, which sum was to cover the above amount and the cost of offices, boundary walls, paving, clerks of works, and contingencies. The contract with the Horsfall Destructor Company was sealed on June 11, 1902, and the erection of the destructor was commenced on the following day, ten months being allowed for the carrying out of the work. The drying fires were lit on April 20, 1903, and the consumption of refuse began on Monday, May 11, so that the contract time was very closely adhered to. The site chosen for the destructor is land belonging to the Corporation adjoining its electricity works, the idea being that any surplus steam made by the destruction of refuse should be transferred to the electricity department at an agreed charge. The chimney had already been erected of sufficient size to suit the electricity works and the destructor. A clinker crusher is provided together with a revolving screen; and since the opening there has been a good demand for the hard clinker which is produced. A mortar-mill is included in the scheme, and in all specifications for work carried out by the Corporation it is provided that the mortar shall be obtained from the destructor department. The Local Government Board prohibited the sale of mortar, and thus prevents, to some extent, municipal trading. So far as is possible, the destructor answers every expectation, but the quantity of steam produced is limited by the amount of refuse received. During the first few months of working the refuse brought in amounted to 18½ tons per day, while the capacity of the destructor is 40 tons. Since the winter season commenced the refuse has become heavier, and has amounted to 25 or 26 tons per day; the consequence is that it has been possible to supply steam during the whole twenty-four hours, and the average receipts per month have been about 11*l.* The amount paid at present is ¼d. per unit for each unit of electricity produced from steam supplied by the destructor, but it must be remembered that, whilst the electricity department is using steam from the destructor, they have a boiler lying idle, and, at the same time, are saddled with its capital charges in the way of interest and repayment. When the next boiler is laid down at the destructor—that is, when the electricity department next requires a boiler, the steam will be charged at a higher and a fairer price. The Corporation possesses two hospitals; one for ordinary infections, and one for smallpox. Great difficulty has been experienced in procuring suitable pieces of land for the erection of permanent hospitals, though the Corporation is now finding its way out of its difficulties; the consequence is that the whole of the buildings are of corrugated iron and timber construction. The isolation hospital is situated in Little Coates, about three-quarters of a mile outside the borough. The accommodation is for forty beds. The smallpox hospital has been erected within the last twelve months, on a plot of land the Corporation were able to purchase at Laceby, about three miles beyond the borough boundary. The accommodation is for twenty-four patients in two pavilions of twelve beds each, and the administration block contains seven bedrooms. There are three parks in Grimsby. One of these—containing 23¼ acres—is situated in the south part of the borough, on land presented for the purpose by Lord Heneage. The second is situated on the west boundary of the borough, lying along the north bank of the river Freshney, on land forming part of the Corporation estate. The third is situated on the east side of the borough on land presented by Mr. A. W. T. Grant-Thorold. It contains 8 acres, and has been laid out by the author during the past year.

In the course of discussion, the President said he did not agree with the cleansing of gullies on private property by the Municipality. The more public employees were kept off private property the better. As to the selling of steam generated by the destructor, he did not know any case where that had been successful, owing to the variation in the quantity of pressure of the steam produced. He knew many cases where large destructors had been designed on these lines where the bypass for the steam had not been opened after the first three months.

Mr. Vignole, electric lighting engineer, said the arrangement as to the rate of sale to the electric lighting department worked very well, but the amount of steam was very small. In his opinion a great deal too much had been made in the past of raising steam from destructors. There was no doubt the first duty of a destructor was to destroy refuse, and the

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secondary consideration was the raising of steam

Mr. C. F. Wike, Sheffield, considered the taking over of macadam-made roads was an important question in regard to maintenance. It had been done in old times in Sheffield, and now they had the unenviable reputation of being the heaviest rated town in England. They now insisted upon the streets being paved and flagged before they were taken over.

Ald. Doleson, Grimsby, said he was of opinion that the bargain the Corporation had made with the Tramway Company was a very good one.

Mr. Wyatt briefly replied.

Ventilation of Sewers.

Mr. Wyatt, Assoc.M.Inst.,C.E., also read a paper on the ventilation of sewers. He said—"Many medical scientists have proved to their own satisfaction that sewer air is incapable of disseminating the germs of disease, but it is certain that more diseases are now popularly supposed to be traceable to sewer gases than was the case some years ago. It is almost certain, too, that those who live in houses to which sewer gas has access are much more liable to infection from zymotic diseases than those who live in pure atmosphere; whilst, on the other hand, the men whose work occupies them several hours each day in and about sewers seldom acquire any of these diseases. Many municipal engineers and medical officers of health blame the intercepting trap for the increase in the quantity and foulness of sewer air. Some go even so far as to advocate its omission altogether. The chief point raised by them is that the trap is never adequately flushed out, and that decomposable matters remaining in the trap putrefy before they reach the sewer. The intercepting trap was introduced by the experts who were consulted by the Local Government Board in the preparation of their Model Bye-laws in 1876; whilst being correct in theory, it has many drawbacks in practice, and has tended to obstruct the ventilation of sewers through the house drains. Owing to the small quantity and irregular flow of sewage from a small block of houses, putrescible matters are always left in the trap, sometimes for several hours, to be partly carried away by the next flush. Where more solid matters find their way into the drains these are washed along into the trap, there subside, and the trap becomes choked. It has also been found in Grimsby that many drains from properties enter the sewers at so low a level that the junction is submerged, and when the sewage rises above its ordinary level, the air in the length of pipe between the intercepting trap and the sewer becomes compressed, and prevents a flow of sewage through the trap. On account of this frequent blocking of the traps and the obstruction to the ventilation of sewers, many municipal engineers desire to do without them, and some local authorities have ceased to use them. In view, however, of the probability of defects existing in the house drains, the author does not recommend that the intercepting trap should be abandoned. In the author's opinion, the ventilation of sewers (and by this is meant a continuous current in one direction) is not desirable, except on those occasions where workmen have to descend for certain purposes. In this case the opening of manhole covers in the neighbourhood for some period of time before the workmen descend will ventilate that portion of the sewer and the men may descend with safety. Nor is a continuous current of air in any one direction along a sewer a necessity; what is required is a system of vent openings on the sewers, so arranged as to act either as inlets or outlets, discharging the sewer gases away from human beings, house windows, etc. Many attempts have been made to filter the air as it passes up the manhole, either through trays of charcoal or sheets of felt, and in other ways. An effective method of deodorisation is by arranging chemicals so as to have a continual flow of chemical into the sewer air, but these methods are so expensive that no local authority is likely to maintain them for any lengthened period. The conclusions at which he had arrived were (1) That ventilation of sewers at the level of the street is both objectionable and dangerous. (2) That the ventilation of sewers by means of alternate surface openings and tall shafts, on the assumption that the surface openings will always act as an inlet, whilst there is a constant updraught in the tall shaft, is unsatisfactory in practice, as it is found that the direction of the air currents is often reversed, and the surface openings act as an outlet. (3) That the filtration of sewer air whilst passing upwards through surface openings has been proved a failure. (4) That the destruction of sewer gas by cremation, the prevention of the formation of sewer gases by chemicals, and the mechanical removal by fans are too expensive for ordinary use in towns. (5) That the use of factory chimneys or of a few tall shafts of large sectional area is not satisfactory, as their influence is often local. (6) That the solution of the problem appears to be the adoption of a large number of reasonably-sized vent shafts at frequent intervals (this being practically the adoption of surface ventilation at the level of a horizontal plane a few feet higher than house roofs), the vent shafts to be provided in all cases with rust pockets. (7) That sewers must be regularly and frequently flushed so that putrefactive matters may be removed before the production of foul gases commences. (8) That the ventilation of the length of drain between the sewer and the intercepting trap should be arranged for and carried out by the person building at the time of the erection of the property."

The President said that they must recognise that the intercepting trap, which had thrust upon the public authority the nuisance created by the abutting house, had come to stay. He was erecting 6 by 4 ventilating shafts, jointed with molten lead, and carrying them up suitable buildings. That was, in his opinion, about the best thing that municipal engineers could adopt in the present state of things.

Mr. W. A. Vignoles, electrical engineer, presented a paper descriptive of the electrical works.

The afternoon was devoted to an inspection of the destructor, the electricity works, and the fire station, and on the conclusion of the round of visits the Mayor entertained the party to tea at the Yarborough Hotel.

THE INSTITUTION OF CIVIL ENGINEERS:

THE JAMES FORREST LECTURE.

IN the "James Forrest" lecture on "Internal Combustion Motors," delivered last week by Mr. Dugald Clerk at the Institution of Civil Engineers, we have a most useful contribution on the subject of internal combustion motors. Although directing his attention chiefly to work that remains to be done for the improvement of such engines, Mr. Clerk gave some account of what has already been accomplished, thus helping his hearers in some measure to appreciate the probable line of future progress. So far as mechanical details are concerned, there has been manifest improvement during the last twenty years, and in the same period a steady increase of heat efficiency has been manifested. For instance, in Slaby's first test, in 1882, the heat converted into indicated work was only 16 per cent. of the total heat given to the engine, and in the tests by Humphreys and by Witz in 1900, the proportion is 28 per cent. In this question of heat efficiency the chemist and the physicist can undoubtedly help the engineer, and the suggestion made by Mr. Clerk was that such assistance could be best afforded at the present time by settling the data necessary for the formulation of a quantitatively accurate standard engine of comparison. Before such a machine can be realised, more knowledge is required as to the actual conditions prevailing during gaseous explosions, and, as to the specific heat of air and various gases at high temperatures, Mr. Clerk, who possesses no mean claim to be called a physicist—although modestly differentiating himself as an engineer—proposed three methods for determining the specific heat of such substances:—(1) By compressing the gas in a pump cylinder, and, after comparing compression and expansion curves together with heat flow, by calculating the specific heat; (2) by heating the gas electrically, then measuring its temperature when incandescent, and absorbing the heat in a calorimeter; and (3) by causing a gaseous explosion, then measuring the inflammable gas not consumed, and so estimating for a given period of the explosion the amount of heat evolved at a given point. Such experiments are laborious and expensive, and several years' work might be required to obtain the essential data. The present position of gas-engine theory is much in the state occupied by steam-engine theory before the properties of steam were accurately determined, and a settlement of the points raised by Mr. Clerk would be of immense service to those who are interested, directly and indirectly, in the continued progress of the internal combustion motor.

TRADES UNIONS AND TRADE DISPUTES.

THE following is the text of the bill which was discussed on Friday last in the House of Commons, and is referred to in a Note in our present issue:—

A Bill to Amend the Law relating to Trade Unions and Trade Disputes.

"Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present parliament assembled, and by the authority of the same, as follows:—

1. Legislation of peaceful picketing.—It shall be lawful for any person or persons acting either on their own behalf or on behalf of a trade union or other association of individuals, registered or unregistered, in contemplation of or during the continuance of any trade dispute, to attend for any of the following purposes at or near a house or place where a person resides or works, or carries on his business, or happens to be:—

(1) for the purpose of peacefully obtaining or communicating information:

(2) for the purpose of peacefully persuading any person to work or abstain from working.

2. Amendment of law of conspiracy.—An agreement or combination by two or more persons to do or procure to be done any act in contemplation or furtherance of a trade dispute shall not be ground for an action, if such act when committed by one person would not be ground for an action.

3. Protection of trade union funds.—An action shall not be brought against a trade union, or other association aforesaid, for the recovery of damage sustained by any person or persons by reason of the action of a member or members of such trade union, or other association aforesaid.

4. Short title.—This Act may be cited as the Trades Dispute Act, 1904.

THE LONDON COUNTY COUNCIL.

THE first ordinary weekly meeting of the London County Council after the Easter recess was held on Tuesday in the County Hall, Spring Gardens, Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council, 10,249*l.* for electric lighting works; Hackney Guardians, 20,000*l.* for Poor Law purposes; Lewisham Borough Council, 4,202*l.* for sewers; Poplar Borough Council, 2,519*l.* for public libraries; St. Pancras Borough Council, 19,482*l.* for the erection of lodging-houses; and Whitechapel Guardians, 3,000*l.* for Poor Law purposes. Sanction was also given to the following loans:—Stepney Borough Council, 17,650*l.* for electric light installation, and 40,000*l.* for electric light installation and meters; and Westminster City Council, 6,000*l.* for paving works.

Housing Loans.—The Finance Committee reported that, as the result of negotiations with the Treasury, the Treasury were prepared to extend the period of loans for land to eighty years, and to waive the condition that this should be accompanied by the adoption of the instalment system of repayment.

Mr. A. Smith congratulated the Committee on having got the important concessions they had. He regretted, however, that the period for buildings had not been also extended.

Lord Welby, replying to Mr. Verney, said the Committee would continue to press the desirability of extending the period of loans beyond the sixty years. At present the Treasury did not cast any doubt as to the life of the Council's buildings, but they objected on principle to loans on buildings being for more than sixty years.

War Trophies.—The Parks Committee recommended that two guns which had been allotted to London should be placed within the railings of the Victoria Embankment-gardens. One is a 57mm. B. L. Krupp gun, a trophy of the South African War, and the other a bronze 5½-ton gun captured in the recent China Expedition.

Mr. Dolman moved, and Mr. Taylor seconded, that the recommendation be referred back.

Sir William Richmond said the Council had no business with political matters, and they were not called upon to say whether the Boer War or the Chinese War were just wars. There was, however, another question. Was it desirable to put in the face of a peaceful people the very implements which had been slaughtering their soldiers and the soldiers of other countries as good as theirs? Therefore, he supported the Amendment with all his heart.

The amendment was ultimately carried by seventy-four votes to forty.

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Paving and drainage of Stables and Stable Yards.—The following recommendation of the Parliamentary Committee was agreed to:—"That the course of action taken by the Parliamentary Committee in withdrawing the application to Parliament, sanctioned by the Council on June 23, 1903, for powers to enable the Council to make by-laws requiring stables to be paved with impervious materials, be approved.

Tramway Works.—The Highways Committee recommended, and it was agreed:—

"That the estimate of 5,000*l.* submitted by the Finance Committee be approved; and that expenditure on capital account, not exceeding that amount in all, be authorised in connexion with the purchase by the Council of the site known as 'The Gables,' East-hill, Wandsworth, for the erection thereon of a sub-station for the electrical working of a portion of the Council's tramways.

"That the site known as 'The Gables,' East-hill, Wandsworth, referred to in the foregoing resolution, be acquired from the Wandsworth Board of Guardians for the sum of 4,500*l.*; that the valuer do issue a draft contract, allowing, in addition to that amount, one surveyor's fee on Ryde's scale, an amount for solicitors' preliminary costs, the usual legal expenses of deducing title, and any other necessary expenses.

"That expenditure not exceeding 15,000*l.* be authorised in connexion with the supply, delivery, and laying of (i.) the high-tension cables, and (ii.) the low-tension cables, required in connexion with the reconstruction, for electrical traction, of certain short lengths, situated in the Metropolitan Boroughs of Southwark and Bermondsey, of the London County Council Tramways.

"That the offers of Messrs. Siemens Brothers and Co., Limited, and the British Helsby Cables, Limited, respectively, to supply, deliver, and lay, at the schedule rates under their existing contracts with the Council (i.) the high-tension cables, and (ii.) the low-tension cables, referred to in the foregoing resolution, be accepted.

"That the estimate of 410*l.* submitted by the Finance Committee be approved; and that expenditure of sums not exceeding that amount in all be authorised in connexion with the supply and erection of additional low-tension switchboards for the Elephant and Castle sub-station of the London County Council Tramways.

"That the offer of Mr. Bertram Thomas to supply and erect, at the schedule rates under his existing contract with the Council, the low-tension switchboards referred to in the foregoing resolution, be accepted.

"That the supplemental estimate of 4,000*l.* submitted by the Finance Committee be approved, in connexion with the purchase of single-truck electrical cars for use on the Streatham and other sections of the London County Council Tramways; and that expenditure of 112*l.* 8*s.* be sanctioned, in addition to the sums of 47,686*l.* and 11,200*l.* sanctioned for the purchase from Messrs. Dick, Kerr, and Co., Limited, of 100 single-truck electrical cars."

Holborn-to-Strand Lettings.—The Improvements Committee reported that they were considering what modifications, if any, should be made in the conditions upon which the Council's land, in connexion with the Holborn to Strand improvement, had in the past been offered for letting, but they had not yet had sufficient time to formulate any definite proposals.

Piccadilly Widening Rumour.—Earl Carrington asked the chairman of the Improvements Committee if his attention had been called to a newspaper report, which stated that certain property had been acquired by the Council for the widening of Piccadilly at the south end of Park-lane?

Mr. W. Davies replied that he had seen the statement that the Council had acquired Gloucester House for that purpose, but there was no authority for it.

The Council shortly afterwards adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

City.—(*a*) That the resolutions in respect of the erection of an open iron and concrete gangway across Water-street, City, to connect warehouses on the east and west sides of that street (Messrs. Cheston and Perkin for Messrs. Spicer Bros., Ltd.), be rescinded; (*b*) an open iron and concrete gangway across Water-street, City, to connect warehouses on the east and west sides of that street (Messrs. Cheston and Perkin for Messrs. Spicer Bros., Ltd.).—Consent.

Brixton.—(*a*) That the resolution consenting to the erecting of a building on the south side of Southesk-street, Stockwell (Mr. W. S. Huxley for Messrs. Hammerton and Co.), be rescinded; (*b*) a building on a site on the south side of Southesk-street, Stockwell (Mr. W. S. Huxley for Messrs. Hammerton and Co.).—Consent.

Lines of Frontage and Projections.

Clapham.—A show-case upon part of the forecourt of No. 81, Clapham-park-road, Wandsworth (Mr. G. Garner for Mr. W. Whiteman).—Consent.

St. George, Hanover-square.—An iron and glass shelter in front of the "York Hotel," Albemarle-street, St. George, Hanover-square (Mr. S. J. May for Mr. F. May).—Consent.

Hampstead.—The retention of an addition to a covered way in front of No. 38, Quex-road, Hampstead (Mr. J. D. Hunter for Mr. H. Marx).—Consent.

Dulwich.—Retention of two-story bay-windows to two houses on the west side of Carlton-road, Dulwich (Mr. A. E. Millins for Mr. J. H. Cooper).—Consent.

Hackney, North.—One-story shops upon part of the forecourts of Nos. 8 and 10, Stamford-hill (Mr. J. Hamilton for Messrs. Smallshaw and Walker).—Consent.

Hampstead.—Porches, bay-window, verandah, and projecting truss bracket to No. 58, Kidderpore-avenue, Hampstead (Mr. T. C. Ovenston, for Mr. C. Topham).—Consent.

Hampstead.—A timber-framed porch to a house in course of erection on the south side of Eton-avenue, Hampstead (Mr. A. F. Faulkner for Mr. Willett).—Consent.

Islington, East.—An iron and glass-covered way in front of the Highbury Athenæum, Highbury New Park, Islington (Messrs. W. Bradbear and Son for the Highbury Athenæum, Ltd.).—Consent.

Kensington, South.—An iron and glass porch to No. 13, Essex-villas, Phillimore-gardens, Kensington (Mr. G. H. Webb for Mr. R. L. Pugh).—Consent.

Lewisham.—Porches to Nos. 30 to 58 (even numbers only), inclusive, Homecroft-road, Sydenham (Mr. A. Haines for Messrs. Cakebread, Robey, and Co.).—Consent.

Marylebone, East.—A porch to block E, Clarence Gate-mansions, Glentworth-street, St. Marylebone (Messrs. Hudson and Hunt for the Clarence Gate-mansions Company, Ltd.).—Consent.

Marylebone, East.†—Bay-windows, porches, balconies, and projecting chimney stack at No. 54, Great Marylebone-street and Nos. 58 and 59, Wimpole-street, St. Marylebone (Mr. F. M. Elgood for Mr. S. Lithgow).—Consent.

Paddington, South.—Addition to an existing one-story shop in front of No. 58, Westbourne-grove, Paddington (Mr. J. C. Radford for Mr. H. C. Brown).—Consent.

St. George, Hanover-square.—The retention of an iron and glass shelter at the restaurant entrance at the Berkeley Hotel, No. 77, Piccadilly (Messrs. Forsyth and Maule for the directors of the Berkeley Hotel Company, Ltd.)—Consent.

Wandsworth.—Retention of three buildings on the south side of Oakhill-road, Wandsworth, westward of Putney-bridge-road (Messrs. Witham, Roskell, Munster, and Weld for the Misses Kenyon, Monahan, and Bodkin).—Consent.

Wandsworth.—That the application of Mr. C. W. Isitt for an extension of the periods within which the erection of a building on the south side of New-park-road, Brixton, eastward of Streatham-place, was required to be commenced and completed be granted.—Consent.

Wandsworth.—Retention of a greenhouse in the garden of No. 10, Lessingham-avenue, Wandsworth (Mr. R. Baylis).—Consent.

Wandsworth.—The retention of two porches to Nos. 63 and 65, Wimbledon-park-road, Southfields, Wandsworth (Mr. F. E. Boulting).—Consent.

Westminster.—An oriel window to a building on the south side of Great College-street, Westminster (Mr. A. B. Jackson for the Governing Body of Westminster School).—Consent.

Kensington, North.—Water-closet additions over the porches in front of Nos. 123, 125, 133, 135, 143 and 145, Elgin-crescent, Notting-hill (Mr. C. W. Boswell for Mr. G. Colley).—Refused.

Chelsea.—The enlargement of an existing bay-window at No. 22, Hans-place, Chelsea, abutting upon Pont-street (Mr. C. Eliot for Mr. C. Rose).—Refused.

Hampstead.—Building in front of "North-court" on the north side of Finchley-road, Hampstead (Mr. H. H. Collins for the Committee of the Home for Incurable Children).—Refused.

Kensington, South.—Buildings on a site on the south side of Kensington-road, Kensington, to abut also upon Palace-gate (Messrs. Millard and Pryce for the Royal Exchange Assurance Company).—Refused.

Lewisham.†—Two signs at No. 17, Sydenham-road, Sydenham (Mr. E. Bates for Messrs. Welfords Surrey Dairies, Ltd.).—Refused.

Wandsworth.—Buildings upon the site of Nos. 17, 19, 21, 23 and 25, Balham-hill, Wandsworth (Messrs. Searle and Hayes for Messrs. J. Garrett and Sons).—Refused.

Woolwich.—Permission to deviate from the plan approved for the erection of five cottages next the "Red Lion" public-house, and the adaptation and widening of a portion of an existing footway in front of such cottages, between Red Lion-lane and Shooter's hill, Woolwich (Mr. J. Cook).—Refused.

Lines of Frontage and Construction.

Hampstead.—The retention of a wood and iron shed erected at the rear of "Lynwood," No. 34, Eton-avenue, Hampstead, abutting upon Lancaster-road (Mr. V. Wilkins for Mr. Neresheimer).—Consent.

Width of Way.

Hammersmith.†—A porch at No. 14, Willowvale, Uxbridge-road, Hammersmith (Mr. A. G. Channer for Mr. J. Watts).—Consent.

Brixton.—One-story office building at No. 175, Ferndale-road, Brixton (Mr. W. H. Duffield for Mr. D. Greig).—Consent.

Finsbury, East.—A building on the south side of Bayer-street, Golden-lane, Finsbury (Messrs. Gordon and Gunton for Mr. C. Bayer).—Consent.

Hampstead.†—A one-story addition to Christchurch Cottage, Christchurch-passage, New-end, Hampstead (Mr. J. D. Hunter for Mr. A. E. Rusher).—Consent.

Limehouse.—Buildings on the site of Ratcliff-cross-wharf, Broad-street, Ratcliff (Mr. T. H. Dunch for Messrs. H. Evans and Sons).—Consent.

Southwark, West.—A building on the site of Nos. 1, 3, and 5, The Grove, Southwark (Messrs. F. Chambers and Son for Messrs. Barclay and Fry, Ltd.).—Consent.

Woolwich.—Buildings at Mast Pond-wharf, Dockyard Rails, Woolwich (Mr. H. P. Drew for Messrs. Carlo Gatti, Stevenson, and Slater, Ltd.).—Consent.

Hackney, North.†—Buildings on the east and west sides of a roadway leading out of the north side of Farleigh-road, Hackney, between Nos. 3 and 5 (Mr. G. H. Capper for Mr. A. C. Jackson).—Refused.

Width of Way and Line of Frontage.

Lambeth, North.—A one-story building on the north-western side of Sidford-place, Hercules-road, Lambeth (Mr. E. Brindley).—Refused.

Width of Way and Space at Rear.

Islington.—Blocks of flats at the rear of No. 17, Highbury-crescent, Islington, to abut upon Highbury-crescent West (Mr. E. C. Beaumont for the Prudential Mortgage Company, Ltd.).—Consent.

Width of Way and Construction.

Wandsworth.—A covered play-shed at the school on the north side of Holly-grove, Balham (Mr. T. J. Bailey for the School Board for London).—Consent.

Space at Rear.

Lewisham.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a two-story dwelling-house at No. 48A, Mount Pleasant-road, Lewisham, with an irregular open space at the rear (Messrs. Hatch and Hatch).—Consent.

Greenwich.—An addition at the rear of No. 119, Humber-road, Westcombe-park, Greenwich (Mr. A. Roberts for Mr. W. Ballard).—Refused.

Space at Rear and Projections.

Kennington.—Residential flats upon a site abutting upon the west side of Kennington-park-road and north side of Harleyford-street, Kennington (Messrs. T. Hooper and Son for the Duchy of Cornwall).—Consent.

Kensington, South.—A building on the northern side of Pelham-street and eastern side of Thurloe-square, Kensington (Mr. L. W. Green for the Metropolitan District Railway Company).—Consent.

Formation of Streets.

Lewisham.—That an order be issued to Messrs. Norfolk and Prior, sanctioning the formation or laying out of a new street for carriage traffic, to lead from Davenport-road to George-lane, Catford, and in connexion therewith the widening of a portion of George-lane (for Mr. C. C. Storey).—Consent.

Hammersmith.—That an order be issued to Messrs. R. B. Grantham and Son, sanctioning the formation or laying out of new streets for carriage traffic out of the east side of Old Oak-road, Uxbridge-road, Hammersmith.—Consent.

Means of Escape at Top of High Buildings.

Strand.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, from the eighth (top), seventh, sixth, and portions of the fifth, fourth, and third stories of the Savoy Hotel extension, Strand, for the persons dwelling or employed therein (Messrs. Collcutt and Hamp).—Consent.

Hoxton.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, from the topmost story

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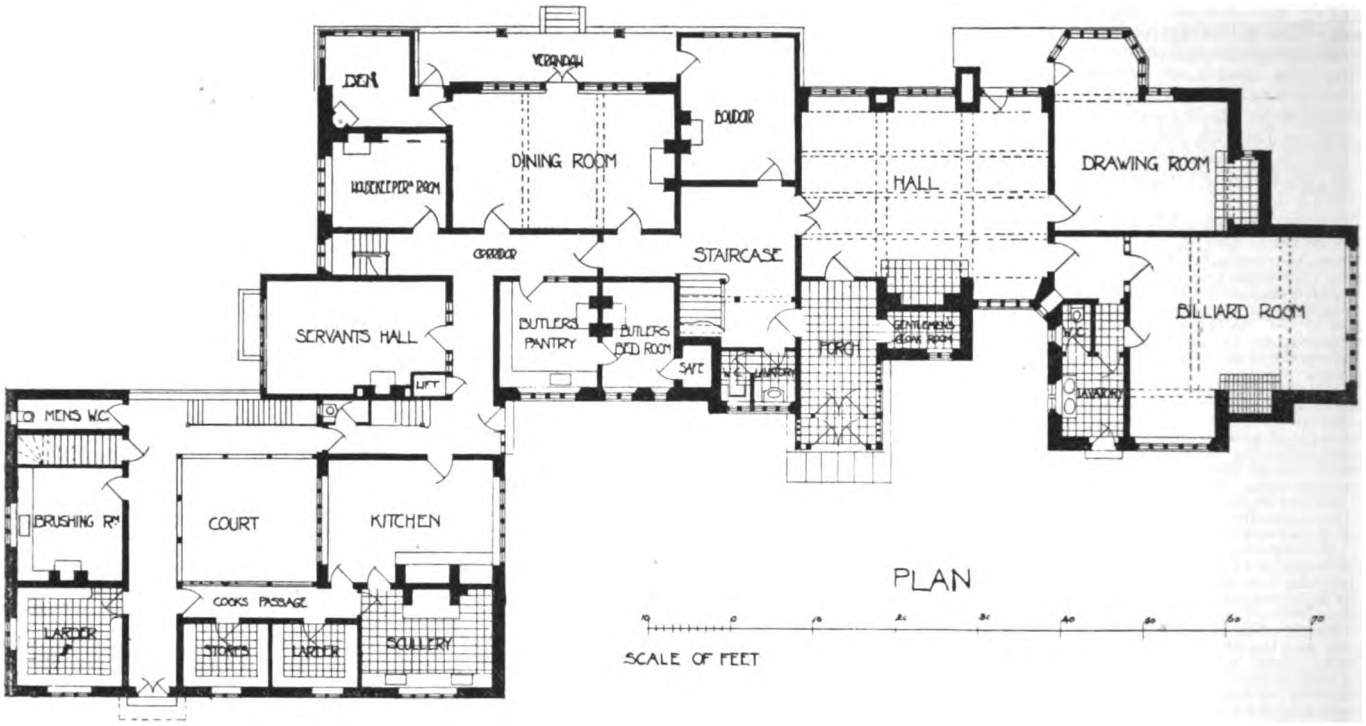


Chelwood Manor, Sussex. Plan.

of Nos. 2 to 12 (even numbers), Wilson-street, and Nos. 2 and 3, Eldon-street, Hoxton, for the persons dwelling or employed therein (Mr. G. Sherrin for Mrs. A. Sadgrove).—Consent.

Working-class Dwellings and Width of Way.

Holborn.—Dwelling-houses, to be inhabited by persons of the working class and proposed to be erected, not abutting upon a street, on a site on the west side of Leather-lane and south side of Portpool-lane, Holborn (Mr. R. Robertson for the Housing Committee of the Council).—Consent.

Holborn.—Buildings upon a site abutting upon Portpool-lane, Leather-lane, Leopards-court, Baldwin's-place, and Verulam-street, Holborn (Mr. R. Robertson for the Housing Committee of the Council).—Consent.

The recommendations marked thus † are contrary to the views of the local authority.

Illustrations.

NEW REREDOS, CHELTENHAM COLLEGE CHAPEL.

THIS reredos, which fills the whole of the wall of the chapel under the east window, is part of the Memorial to Old Collegians who fell in the South African war. It is frankly on the lines of the great altar screens at Winchester and St. Albans, with a Crucifixion group in the middle and niches on either side. The selection of the figures was left to the Principal of the College, the Rector of Lincoln College, Oxford, and the Architect; and apart from the central group, and the Magi group below it, with the four Archangels and the four National Patrons, it was agreed that all the other niches should be filled by figures of representative Englishmen. On the larger scale are:—(*a*) Founders and Champions—Alban, Arthur, Edmund, Columba, Augustine, Aidan; (*b*) Builders of Church and State—Becket, Langton, Dunstan, Anselm; (*c*) Makers of the English Bible and Prayer Book—Bede, Wycliffe, Cranmer, Tyndale; (*d*) Leaders of Great Movements—Wesley, Raikes, Howard, Keble, Colet, Wilberforce.

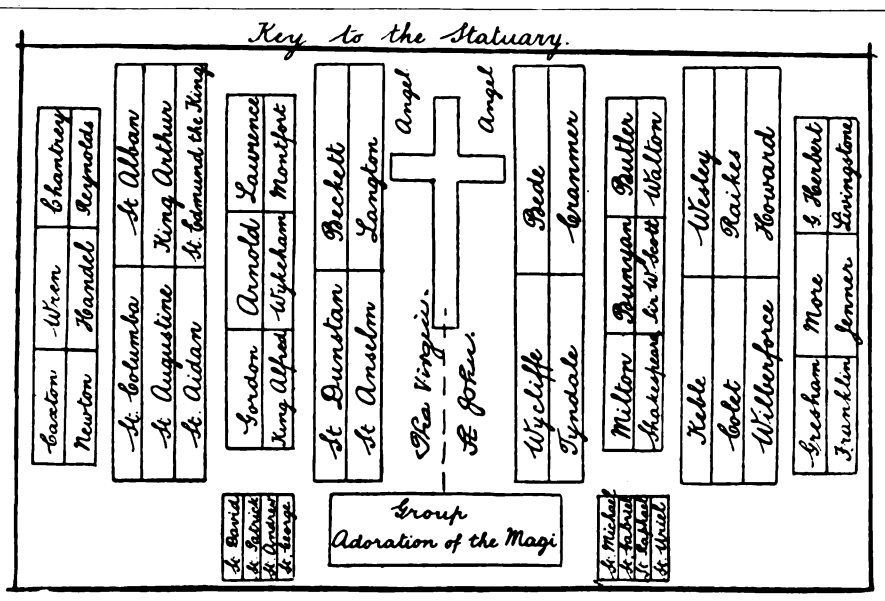
The smaller figures represent various arts, professions and walks in life:—Chantrey, Reynolds, Wren, Handel, Caxton, Newton, Lord Lawrence, Simon de Montfort, Arnold, Wykeham, Gordon, King Alfred, Bishop Butler, Walton, Bunyan, Scott, Milton, Shakespeare, George Herbert, Livingstone, Sir Thomas More, Jenner, Gresham, and Franklin.

The space between the niches is filled with the vine, rose, thistle, shamrock, and leek.

The whole work is carried out in Clunch by Messrs. Boulton and Sons, of Cheltenham, at their workshop; the statues being modelled and carved by A. Neal, J. Angel and T. Smith.

The annexed diagram gives the names and positions of the figures represented.

The alabaster retable, put up some years ago as a memorial to Lieutenant Moores, and the altar itself in memory of the Rev. T. A. Southwood, the well-know Head of the Modern Side for many years, were carved by Messrs. Martyn and Co., of Cheltenham. The picture forming the altar-front is by Sir W. B. Richmond. H. A. PROTHERO.



Reredos, Cheltenham College Chapel. Diagram of the names and position of the statues.

NEW PREMISES FOR THE ECCLESIASTICAL COMMISSIONERS, WESTMINSTER

This is the first block of buildings erected under the Westminster Improvement Act upon the Ecclesiastical Commissioners own property. The whole building is a four-square block of business premises for the Commissioners, their staff, their lawyers, architects and agents, and may be left to speak for itself.

Occasion has been taken to widen Millbank-street, and the Commissioners have in the public interests voluntarily set back their frontages in Great and Little College-streets, in some parts as much as 20 ft.

The property which this building takes the place of had no intrinsic interest, and was generally of the poorest character. Its displacement led to the extinction of two public house licences among other advantages.

Messrs. G. Trollope and Sons built the foundations and the basement story.

The superstructure is being erected by Messrs. Johnson and Sons of Leicester.

W. D. Caröe is the architect.

CHELWOOD MANOR, SUSSEX.

THIS half-timber mansion, which is now in course of erection, is intended for a dower house, and is charmingly situated on the southern border of the Ashdown Forest, some six miles from Forest Row.

The site is an entirely new one, and valuable help has been rendered by Mr. T. H. Mawson in forming the approach and gardens in keeping with a house of this class. Stables, cottages, and lodges are also being built. Odessa oak has been used for the outside timber work with an average thickness of four inches, and the woodwork is all framed and pinned after the old manner of timber houses, many of which are to be found in this locality. The base of the house is built of local sandstone in narrow courses, and the chimney stacks are formed in local brick. The hall, which will form the principal living room, is panelled in wainscot oak, and a feature has been made of the fireplace with radiating bricks and stone dressings.

The water supply is obtained from a spring in the low-lying ground about a quarter of a mile away from the house and is pumped into cisterns in the roof by means of an oil engine. This work, including the septic tank and heating, is being carried out by Messrs. Matthew Hall and Co., of London.

The Westminster Engineering Co. are supplying the electric light plant and the wiring; the contractor for the general work is Mr. Job

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Luxford of Forest Row. The iron casements are being supplied by Mr. George Wragge.

Mr. A. N. Prentice is the architect. The drawing is hung in this year's Royal Academy.

HOUSE AT ARISAIG.

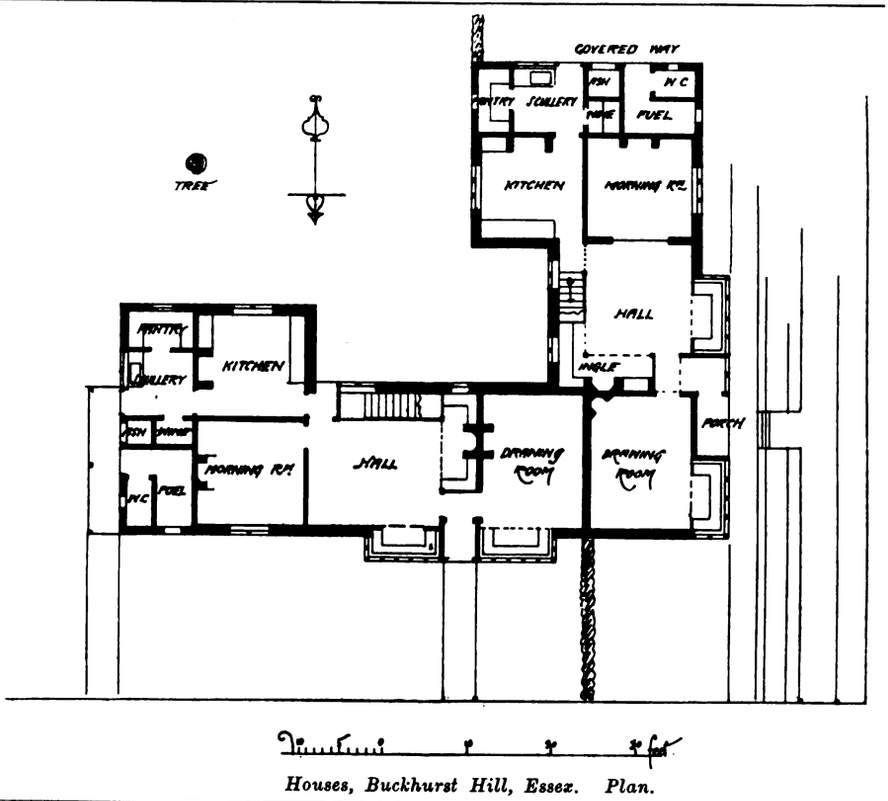
THIS is an illustration of a house which was exhibited in last year's Royal Academy in a very effective drawing. It may be taken as an attempt to produce a picturesque effect in a simple manner with local materials. Mr. George Jack is the architect.

HOUSES, BUCKHURST HILL.

The arrangement of these houses was governed by the necessity of preserving a fine tree on the site, and also to give both the full advantage of a view over the country.

The hall was intended for use as the dining-room also.

The materials to be used were grizzle bricks, rough-cast over, and Rosemary tiles for the roofs. A. NEEDHAM WILSON.



Houses, Buckhurst Hill, Essex. Plan.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—The annual meeting of the Liverpool Architectural Society was held on the 18th inst., Mr. J. Woolfall presiding. From the report of the council it appears that there are 54 Fellows, compared with 51 in the previous year. The Associates have increased to 59 from 57, the students to 36 from 31, and the honorary members are now 14 against 15, making a total of 163. The council regretted to record the death of Mr. James Rhind and Mr. J. H. Cook. Mr. T. E. Eccles has been appointed joint representative of the Society on the Board of Architecture of the University. Professor Simpson's seat on the council had been filled by the translation from Associate to Fellow of Mr. Arnold Thornely, and Mr. B. M. Ward had taken Mr. Thornely's place. Referring to the work of the session, the report stated that a deputation from the Master Builders' Association met the President, Mr. Thicknesse, and Mr. Culshaw, with reference to the growing custom of specifying that builders must include in tenders a sum for attendance on work to be done by specialists. They stated that the architect was in a better position for estimating the cost of attending on specialists, and it would be mutually fairer for him to state a sum, instead of leaving the amount to be guessed at by the builder. The council agreed that this was reasonable, and they hoped members of the society would see their way to follow the suggestion. The report of the Library Committee was of an encouraging character, special reference being made to the fact that the younger members were showing more appreciation of the advantage of the library as a club-room, with the benefit of mutual association. The accounts showed a balance in hand of 53*l.* 7s. 11d., as compared with a balance of 36*l.* 2s. 2d. from the preceding year. The report and accounts were adopted. Professor C. H. Reilly, of the Liverpool University, was elected a Fellow of the Society. Mr. Philip C. Thicknesse was elected President, Mr. T. E. Eccles and Mr. Hastwell Grayson, vice-presidents; Mr. Gilbert Fraser and Mr. Ernest C. Aldridge, hon. secretaries; Mr. Jas. Doi' hon. treasurer; Mr. L. P. Abercrombie, hon. librarian; Mr. W. J. Dobie and Mr. M. Honan, hon. auditors; Messrs. J. Dod, A. Thornely, W. E. Willink, E. P. Hinde, S. P. Morter, S. P. Powell, and J. Woolfall were elected members of the council; and Mr. B. M. Ward and Mr. F. B. Hobbs associates. A cordial vote of thanks was tendered to the retiring President, Mr. Woolfall, for his services during the past year.

EDINBURGH AND GLASGOW ARCHITECTURAL ASSOCIATIONS.—Members of the Edinburgh Architectural Association, to the number of over thirty, paid a visit to Glasgow an Saturday last. Leaving Princes-street Station at 1.5 p.m., they arrived at the Central Station, Glasgow, shortly after two o'clock, and were there joined by about forty members of the Glasgow Architectural Association. Conveyances were in waiting, and the joint party drove through the principal streets of the city with a view to inspecting the leading architectural features. Among the places visited were the Trades' Hall, Glassford-street; the Faculty Hall, St. George's-place; the University, Gilmorehill; and the Accountants' Hall, St. Vincent-street. The interiors of several west-end mansions were also inspected. In the evening a company of between seventy and eighty sat down to dinner in the Lansdowne Restaurant. The chair was taken by Mr. W. J. Blain, President of the Glasgow Association. The toast of the "Edinburgh Association" was proposed from the chair. Mr. A. Hunter Crawford, F.R.I.B.A., responded, and in turn proposed the toast of the "Glasgow Association." The Edinburgh members left by the 9.50 p.m. train from the Central Station.

MANCHESTER SOCIETY OF ARCHITECTS.—The annual report of the council of the Manchester Society of Architects states that the Manchester School of Architecture, and the inauguration of the Chair of Architecture at the Victoria University of Manchester, having become an accomplished fact, as set out in last year's report, the Council deemed it desirable that the members of the architectural profession should have an opportunity of subscribing to the endowment fund of the school. A circular was issued asking the members of the Society to subscribe, and several appeals have been addressed to the members, and to all practising architects in the neighbourhood. A sum of about 200*l.* only has been subscribed by way of donations and subscriptions. Members are reminded that the fund is still open, and donations or subscriptions can be sent to the secretary. In accordance with the regulations governing the appointment of the Advisory Committee of the Manchester School of Architecture, the Society is represented thereon by the President, Mr. J. W. Beaumont and Mr. Paul Ogden.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held on Wednesday, the 20th inst., when the President, Mr. R. E. Leader, B.A., occupied the Chair. Mr. A. R. Goddard, of Bedford, exhibited a curious Matabele knife, also an early XVIIth century carving-knife, which, Mr. Parkin, of Sheffield, said, corresponded in every respect to similar articles largely manufactured at Sheffield at the present time. Mr. Patrick, hon. sec., exhibited a fine example of penmanship in the shape of "A Copybook by John Ayres, Master of ye Writing School near St. Paul's Free School in London, sold by ye Author at Ye Hand and Pen in Paul's Church Yard." The quaintly-worded preface is dated 1683. Spare leaves at the end of the book have been filled at a later date with curious old woodcuts of animals, thought to be from early blocks by Bewick. The Rev. H. J. D. Astley, hon. editorial secretary, read a letter from a foreign archæological correspondent with reference to the discoveries at Chislehurst, in which he showed, from his own experience in similar explorations, that the opposite theories of Mr. Nichols and Mr. Forster with regard to the antiquity of the caves and their purpose may each be correct. A paper by Mr. Leader was read by him on "Sheffield Cutlery and the Poll Tax of 1379." It appears that the earliest known mention of Sheffield in connexion with knives is in a schedule of goods issued from the King's wardrobe at the Tower, about the fourteenth year of King Edward III. (1340), in which "viii cultells de Hiberto, xx paryos cultellos de Assheborne" and "i cultellum de Shefeld" are referred to. With Chaucer's reference in the Reeves Tale, to the "Shefeld thwytel," this is the only testimony to the existence of the cutlery manufacture, or of any other manufacture at Sheffield so early as the XIVth century. As the "Canterbury Tales" are usually assigned to the latter part of Chaucer's life, *i.e.*, from 1373 to 1400, and were probably put together as a whole rather later than 1386, the date is near enough to say that they were contemporary with the Poll Tax. From the name of Sheffield being associated by Chaucer with knives, we might have expected to find proof of the existence of the industry in the very carefully-prepared schedules for taxing the inhabitants. Those who levied the tax did their work very thoroughly, and were careful to record the status of any individual whose position justified the levying of a higher tax than the minimum of 4d.; and thus we find the ordinary tradesmen — smiths, cobblers, tailors, coopers, butchers, and the like, are mulcted in 6d.; farmers, 12d.; and drapers, innkeepers, tanners, merchants (of whom there were none in Sheffield) at this or even at higher rates. It is curious, therefore, to find that in the Sheffield return not a single cutler is thus distinguished. The only trace of the occupation in this town is the entry, "Johannes Coteler iiijd." Assuming that he was a cutler, the presence of one artisan of the humblest rank cannot be taken to be an adequate explanation how Sheffield could have acquired fame for the production of knives. Mr. Goddard, Mr. Gould, Mr. Rayson, Mr. Williams, Rev. H. J. D. Astley, Mr. Kershaw, Dr. Birch, and others joined in the discussion following the paper. A second paper was then read by Mr. Patrick, in the absence of the author, Mr. A. Denton Cheney; this was descriptive of "Shepway Cross" and the "Court of Shepway." In the days of the old Roman occupation Shepway stood upon the great Roman highway running from London, through Rochester and Canterbury, to the Portus Lemanus, the principal port in southern Britain. The peculiar point of interest attaching to Shepway Cross is, not that it stood upon the busy highway of Roman commerce, but in the fact of its intimate and important connexion with that most remarkable organisation, the "Confederation of the Cinque Ports," of which the "Court of Shepway" "was at once its parliament and its court of justice." There has

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been some difference of opinion as to the origin of the name Shepway; some writers having derived it from the vast numbers of sheep which for ages past have fed upon the Romney marshes; but there is little doubt that the name really means—the way to the ships of the Roman port. The monks of Christ Church, Canterbury, were large landowners in this district, and to them is due the erection of the wayside cross, or crucifix, which once stood at the cross roads where the way from Hythe is crossed by the old Stone-street. The paper dealt at considerable length and in a very interesting manner with the history of the Cinque Ports, and particularly with that unique institution the "Court of Shepway."

THE SANITARY INSTITUTE:

PROVINCIAL SESSIONAL MEETING AT CARDIFF.

A PROVINCIAL sessional meeting of the Sanitary Institute was held at the Town Hall, Cardiff, on Saturday last week, under the presidency of Mr. William Whitaker, B.A., F.R.S., F.G.S. In the absence of the Mayor, who was out of town, the deputy-mayor (Councillor Lewis Morgan) welcomed the members of the Institute.

The Chairman stated that until two or three years ago the Sanitary Institute only met in London, but there were so many members in various country places that it was deemed advisable to hold some of the meetings in the provinces. The experiment had been very successful, the last meeting in Birmingham being attended by 200 or more. The Institute also had branches in the Colonies. It was also a body for sanitary inspectors, a very large number of whom took advantage of the training they received.

Dr. Walford, medical officer of health, Cardiff, read a paper on "School Hygiene in Its Relation to Education Authorities." He pointed out that practically the education authority and the sanitary authority were now one and the same body, and thus an opportunity presented itself for organising a systematic and effective method of supervising the sanitation of schools and promoting the health of the scholars. The comparative neglect of hygiene in connection with school life in times past was probably due to erroneous ideas upon the subject of education. It was, however, a matter of grave national concern that teachers and pupils should carry on their educational work under conditions most favourable to health. Dr. Walford advocated chemical and bacteriological examination of the air of public schools and a more efficient control over the heating and ventilating arrangements of the buildings. Probably the most urgently needed reforms in most large schools, especially the old ones, wer improved methods of heating, combined with an artificial system of ventilation. Imperfect forms of desks and seats and improper modes of handwriting were largely responsible for spinal curvature, impaired vision and St. Vitus' dance. Dealing with another branch of his subject, Dr. Walford said that eighty per cent. of scarlet fever cases occur at school ages, and diphtheria was essentially a disease of school manufacture. He advocated single desks, because with multiple desks there was the danger of close contact between a healthy child and one suffering from some of the ordinary infectious disorders of childhood. He was also in favour of the desks and seats being adjustable so as to suit children of different size. Undoubtedly the changes in administrative methods brought about by the new Act would greatly facilitate improvements in the directions he had indicated, and there was every reason to anticipate a bright future of gradual and important reform. A useful lead had already been given in the recent report of the Royal Commission on Physical Training (Scotland), which contained, among many other important conclusions, one to the effect that it was desirable that all schools should be under regular medical inspection.

Dr. Howard Jones (Newport) deprecated the sending of children under six years of age to school. This country was spending 1,250,000*l.* a year on what was called the education of infants under five years of age. This sum, he thought, might be better employed in higher education, and that would also obviate the necessity of building new schools for several years, except in districts not provided for. Dr. Jones also contended that the health of the children suffered when they were sent to school at such an early age as at present.

Dr. H. Jones (Hereford) contended that the local authority should have the plans of school buildings submitted to them. He gave an instance in which the plans of a voluntary school were passed by the Education Department only three or four years ago, and now numerous improvements were considered necessary to put the building in a sanitary condition.

Dr. Paterson (Cardiff) spoke in favour of gymnasia in connection with elementary schools, and Dr. Tatham Thompson (Cardiff) argued that the present conditions had a tendency to make children short-sighted.

The discussion was continued by Dr. Richards (Croydon), Miss Hurbatt (principal of the Aberdare College), Dr. Thomas (Merthyr), and Dr. Morris (Chairman of the Glamorgan Education Committee), and a vote of thanks was accorded to Dr. Walford for his paper.

Subsequently the members and others proceeded to the Flat Holm, where they had lunch and inspected the isolation hospital and crematorium on the island, returning to Cardiff via Barry.—*Western Mail.*

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—At the Annual General Meeting of the Institution of Civil Engineers, held on Tuesday evening, Sir William H. White, K.C.B., President, in the chair, the result of the ballot for the election of Council for the sessional year 1904-5 was declared as follows:—President, Sir Guilford Molesworth, K.C.I.E.; Vice-Presidents, Mr. F. W. Webb, Sir Alexander Binnie, Dr. Alex. B. W. Kennedy, F.R.S., Mr. W. R. Galbraith; other members of Council, Mr. C. N. Bell (Wellington, N.Z.), Mr. C. A. Brereton, Mr. R. Elliott-Cooper, Col. R. E. B. Crompton, C.B., Mr. W. J. Cudworth (York), Mr. G. F. Deacon, LL.D., Dr. F. Elgar, F.R.S., Mr. R. A. Hadfield (Sheffield), Mr. G. H. Hill, Mr. C. W. Hodson (Bombay), Mr. J. C. Inglis, Mr. G. R. Webb (Birmingham), Mr. T. C. Keefer (Ottawa), Mr. A. G. Lyster (Liverpool), Mr. J. A. McDonald (Derby). Mr. W. Matthews, C.M.G., Sir Charles Metcalfe, Bart. (Cape Town), the Hon. C. A. Parsons, F.R.S. (Wylam-on-Tyne), Mr. A. Ross, Mr. W. Shelford, C.M.G., Mr. Alexander Siemens, Mr. John Strain (Glasgow), Sir John I. Thornycroft, LL.D., F.R.S., Professor W. C. Unwin, B.Sc., F.R.S., Sir Leader Williams (Manchester), Mr. A. F. Yarrow. The Council have made the following awards for papers read and discussed before the Institution during the past session:—A Telford Gold Medal to Major Sir Robert Hanbury Brown, K.C.M.G., M.Inst.C.E., a George Stephenson Gold Medal to Mr. G H. Stephens, C.M.G., M.Inst.C.E., and a Watt Gold Medal to Mr. Alphonse Steiger, M.Inst.C.E.; Telford Premiums to Mr. E. W. De Rusett, M.Inst.C.E., Mr. Hugh Robert Mill, D.Sc., LL.D., Mr. Alexander Millar, Assoc.M.Inst.C.E., and Mr. T. E. Stanton, D.Sc., Assoc.M.Inst.C.E.; a Manby Premium to Professor J. Campbell Brown, D.Sc., and a Crampton Prize to Mr. L. H. Savile, Assoc.M.Inst.C.E. The presentation of these awards, together with those for papers which have not been subject to discussion and will be announced later, will take place at the inaugural meeting of next session.

COMPETITIONS.

TORQUAY MUNICIPAL BUILDINGS. — The premiums in this competition have been awarded as follows:—First premium, to Mr. T. Davison, 28, Great Ormond-street, W.C.; second premium, Mr. S. Towse, 8, New Square, Lincoln's-inn, W.C.

BRIDGE, AYLESFORD.—The Maidstone Town Council have selected a plan for the proposed new bridge at Aylesford. Twenty-eight sets of plans were sent in for the premium of 100 guineas offered for that selected. The Council associated with their Committee the governing body of the Lower Medway Navigation Company, and also had the assistance of an assessor (Mr. A. V. Hurtzig), nominated by the President of the Institute of Civil Engineers. The result of the examination of the plans was that those of Messrs. Dodd and Dodd, of 37, Waterloo-street, Birmingham, were selected as being entitled to the premium.

FREE LIBRARY, STAMFORD—We are officially asked to state that the sending out of conditions and plans to architects in connexion with this competition, which was advertised in our columns, is temporarily delayed in consequence of a misunderstanding as to Mr. Carnegie's intentions in one particular. The Town Clerk has written to Mr. Carnegie, who, it is believed, is in America at present, for definite instructions on the point in question, and as soon as his reply is received the conditions and plan of site will be forwarded to those architects who have applied for them.

BOOKS RECEIVED.

ENGLISH AND SCOTTISH WROUGHT IRONWORK. By Barley Scott Murphy, architect. (B. T. Batsford. 33s.)

ANGLICAN INNOCENTS IN SPAIN. By F. E. Sidney, F.S.A. (Simpkin, Marshall, Hamilton, Kent, and Co. 7s. 6d.)

DYNAMO, MOTOR, AND SWITCHBOARD CIRCUITS. By W. R. Bowker, C.E. (Crosby Lockwood and Son.)

THE LIGHTING OF SCHOOLROOMS. By Stuart H. Rowe, Ph.D. (Longmans, Green, and Co. 3s. 6d.)

Correspondence.

REGISTRATION OF ARCHITECTS.

SIR,—With your usual sense of fair play and courtesy, I trust you will permit me to correct some unintentional mis-statements which you made in your Notes in last week's issue.

We have not sent a circular letter to architects generally, but only to members of the R.I.B.A.

Further, we have sent our circular and pamphlet to *every* member (including yourself and the President of the Institute), without in any way considering whether the recipient was for, or against, our views.

Also, in order that it might be known what we were doing, we sent the letter in question, and the pamphlet, to every member of the Institute Registration Committee, *before* that Committee first sat. This was nearly a week before the general issue to the members of the Institute.

Had you known the above facts, I am sure that you would not have commented as you did upon our course of action. What we have done, whether it is right or wrong, has been absolutely open and above board.

So far from being in any sense hostile to the Council, our only desire is to assist them in the inquiry now proceeding. We have collected much valuable information, and received many suggestions, all of which we shall be very glad to place at the disposal of the Institute Committee.

We had no desire to get a vote for Statutory Qualification in advance of the Report of the Institute Committee. We should have preferred the Council to take a poll, but they were not inclined to do so, and we therefore decided to take one ourselves. We believed that the vast majority of the Institute had long since made up their minds upon the matter, and this we desired to prove. Our belief is confirmed by the fact that, of the replies received to our inquiry, *ninety-five per cent.* are in favour of Statutory Qualification.

The Institute Committee is sitting to inquire if Statutory Qualification is desirable and practicable.

As to the first point, surely the first thing is to obtain the opinion of the members, for, if they do not desire it, it is useless to proceed further in the matter.

As to whether Statutory Qualification is practicable, that is, of course, a matter requiring the utmost consideration and care, but we believe that a sound and practicable Bill can be drafted.

The position is now the same as was the case when the Legal and Medical Acts were passed. They were opposed by many of the leading men in each of those professions, as we are now opposed in ours. Who now questions the benefit of those Acts, both to their respective professions, and to the public? Who of those who then opposed them would not now desire the memory of their opposition to be buried in oblivion?

W. GILLBEE SCOTT.
Hon. Sec. to the London Committee of members of the R.I.B.A., for promoting the Statutory Qualification of Architects.

[*** We have no recollection of ever receiving the papers referred to, either privately or at this office. The special pleading of our correspondent does not, in the least, alter our opinion that it was an improper action for the self-constituted committee to act behind the back of the official Institute Committee.—ED.]

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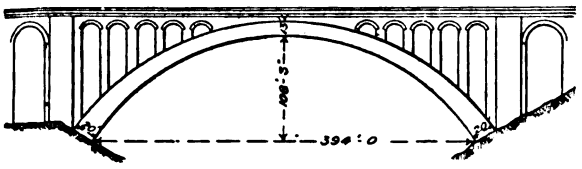

Fig. 68.

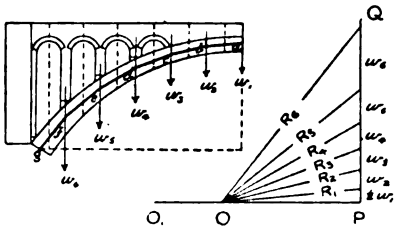

Fig. 69.

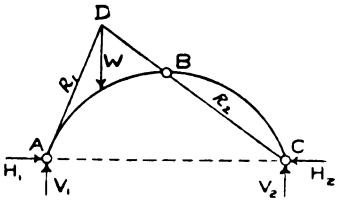

Fig. 70.

CONWAY CHURCH.

SIR,—I should be much obliged if you would kindly allow me to correct a few errors in the report of a lecture on Conway Parish Church published in the *Builder* of April 25. The date of the foundation of the Cistercian Abbey of Aberconwy should read 1186, not 1136. With reference to the western doorway, which has probably been rebuilt, I remarked that it might originally have been the entrance to the chapter-house, not a chapel, as stated in the report. The tomb of "the forty-first child of his father" belongs to the Hookes' family, and not to the Wynns'. HAROLD HUGHES.

[*** Mr. Hughes does not seem to have observed that the report was merely quoted from a provincial paper, the name of which was given and the mistakes are not ours.—ED.]

ST. BARTHOLOMEW'S HOSPITAL.

SIR,—I have been an interested reader of your valuable paper for many years, and have been specially pleased with your historical notes, as I am of antiquarian tastes. I thought that the following inscription, to be seen above the entrance to this famous building in West Smithfield, would probably be worth while printing in your columns:—

"Saint Bartholomew's Hospital. Founded by Rahere, A.D. 1102. Refounded by King Henry VIII., A.D. 1546. This building was erected A.D. 1842. Mathias Prime Lucas, Esq., Alderman, President; Philip Hardwick, R.A., Architect; Thomas Helps, Esq., Treasurer; and enlarged A.D. 1861. The Right Hon. William Cubitt, Lord Mayor, President; William Foster White, Esq., Treasurer; P. C. Hardwick, Architect."

OUTSIDE PASSENGER.

The Student's Column.

ARCHES.—XVII.

NO theory hitherto propounded for the voussoir arch is free from defects, and none of the results obtainable are more than approximately accurate. Consequently, the endeavour has been made to treat the masonry arch in accordance with the theory of the elastic arch, regarding the structure, as if it were an elastic curved beam fixed at the ends.

We have already stated that theoretically no difference exists between an arch of timber, iron, or steel on the one hand, and an arch of stone or brick on the other. But practically there is a considerable difference. When the theory of the elastic arch is applied to masonry several difficulties present themselves. In the first place, as we showed in Article VII., p. 170, much uncertainty prevails as to the precise character and incidence of the external forces. Next, definite and reliable data are still lacking as to the co-efficient of elasticity and the ultimate strength of masonry, and, as masonry is essentially non-homogeneous, the co-efficient is necessarily a variable factor. Finally, the accuracy of esults may be seriously influenced by defects of workmanship and by the design and manipulation of the centring employed for the purposes of construction.

Professor Ira O. Baker, in his "Treatise on Masonry Construction," says that "The application of the theory of elasticity to stone arches has been considerably discussed in late years; but it is generally conceded that the results are, for the most part, illusory, since the much simpler methods give results equally reliable."

As against this it is reasonably contended that some forms of the masonry arch are such that the stresses will practically follow the laws demonstrated for the elastic arch.

Methods for determining the true line of resistance, and based on the theory of the elastic arch, may be thus classified:—

(1) The exact solution, in which the general formulæ employed have been developed from the fundamental equations propounded by Professor Weyrauch.* The line of resistance so ascertained conforms very closely to theory, but this solution is complicated and very laborious.

(2) The approximate solution, in which the formulæ derived from Weyrauch's equations are presented in a simplified form. In some cases the line of resistance obtained agrees closely with that furnished by solution (1), but in other cases it differs considerably. As a general rule, the greater the ratio of span to thickness of an arch ring, and the greater the ratio of rise to span, the smaller will be the difference between the results obtained from solutions (1) and (2).

(3) The solution based on Professor Winkler's hypothesis,† which is to the effect that "for an arch of constant section, that line of resistance is approximately the true one which lies nearest the axis of the arch ring as determined by the method of least squares." The only confirmation of this theorem is to be found in the fact that it leads to certain conclusions which are in harmony with the theory of the solid elastic arch; but the demonstration depends upon various assumptions which cannot be strictly accurate. For the application of Winkler's hypothesis it is first necessary to construct a line of resistance; next, to measure its deviations from the axis of the arch; and then, to calculate the sum of the squares of the deviations. The same course must be followed with regard to all possible lines of resistance, and the line for which the sum of the squares of the deviations is least is said to be the true line of resistance. This method of solution gives a line of resistance deviating so much from that of solution (1) as to constitute a sufficient proof of its unreliability.

It would be impossible to enter upon the discussion of the elastic arch in this series of articles. Those who desire to study the subject in detail will find ample material in various available sources in addition to the treatise by Professor Weyrauch. The theory is fully discussed in "Théorie de l'Equilibre des Systèmes Elastiques" by Castigliano, Turin, 1879. Rankine investigates the matter in a somewhat complicated manner in "Civil Engineering," Article 180, applying the results to arched ribs of uniform stiffness, and making use of assumptions that are not strictly accurate. The "Proceedings of the Institution of Civil Engineers" also contains useful information in the papers of Mr. Martin, Vol. xciii., Mr. Young, Vol. cxxi., and in abstracts of papers from the "Annales des Ponts et Chaussées" in Vols. cii. and cxvi. We may also mention that the excellent treatise on the theory of the elastic arch by Professor Howe‡ contains numerous formulæ, which, by the aid of accompanying tables, can be applied with comparative ease to any given case.

A type of the masonry arch particularly suitable for treatment by formulæ for the elastic arch is illustrated in Fig. 68, which merely represents a design§ and not an arch actually constructed. The arch ring is a rib of masonry supporting thin transverse walls joined by small arches, upon which the roadway is carried, while retaining walls are provided at the abutments to guard against horizontal earth pressure.

This form of design obviously eliminates the uncertainty, existing in the case of arches with solid spandrels, as to the incidence of external forces. The dead weight consists of the weight of the transverse walls, the small arches, and the roadway. As the walls are separated one from another by an interval of space it is evident that the external forces acting upon the arch ring are applied vertically, and calculations need not be complicated by factors representing horizontal components, as we found to be desirable and necessary when discussing the ordinary type of arch construction.

By the principles governing arch design, all the voussoirs of an arch ring such as that here illustrated will be in compression if the equilibrium polygon lies within the middle third of each joint, and, except for the disturbing influence of the mortar in the joints, the masonry arch will behave similarly to a typical elastic rib of homogeneous material. Consequently, the formulæ deduced for the elastic arch may be applied with sufficiently accurate results.

In designing an arch of the general type shown in Fig. 68, it is necessary, as usual, to assume the dimensions of the arch ring and to calculate the loads. The equilibrium polygon is then to be constructed so that it may be seen whether the conditions of stability and strength are fully assured.

The method to be followed for constructing the equilibrium polygon for an arch of this type is somewhat similar to the procedure described in Article IX., p. 229.

Having set out one half of the arch to scale as in Fig. 69, draw vertical lines through the centres of the transverse spandrel walls, and produce the lines to intersect the axis of the arch at the points *a b c d e* and *f*. Connect these points with straight lines, and draw another line from *f* to the middle of the springing joint *g* Then *a b c d e f g* is one half of an equilibrium polygon, almost exactly following the axis of the arch. Next, determine the values of the loads w_1 w_2 w_3 w_4 w_5 and w_6 so that the points *a b c d e* and *f* may not be changed in position in relation to the axis of the arch, and consequently that the equilibrium polygon may continue to lie, as nearly as may be, along the axis of the arch ring. This determination is to be made by means of a force diagram, as shown in Fig. 69.

The crown load w_1 can be directly computed from the assumed dimensions and weights. From any point O_1 draw the horizontal line O_1 P, and from P draw the vertical line P Q, on which lay off, to any convenient scale, one half the value of w_1 the crown load. Draw R_1 parallel to *a b* intersecting O_1 P at the point O, and draw R_2 R_3 R_4 R_5 and R_6 parallel to *bc cd de ef* and *fg*. Then the vertical distances $\frac{1}{2}w_1$ w_2 w_3 w_4 w_5 w_6 on the vertical line represent the required values of the loads at *b c d e* and *f*, and one half the crown load at *a*.

The weight of the spandrel can now be adjusted so that these values may be obtained approximately, and, taking the loads as so settled, actual values of the horizontal thrust, the vertical reaction, and the moment at the abutments can be found by formulæ for the elastic arch. The true equilibrium polygon can then be drawn.

As the tendency of all blockwork arches is to sink at the crown upon or before the removal of the centring, it is impossible in practice to build an arch ring so that the axis may retain its intended form, and the effect of any change must be to render the true position of the equilibrium polygon more or less uncertain. A method largely adopted on the Continent for the purpose of obviating this uncertainty in the position of the equilibrium polygon is to make use of three or more joints which act as hinges, keeping the polygon within the area of the hinged joints, and making it possible to define the pressure at such joints.

These hinges are usually formed by placing lead in the middle third of joints at certain predetermined positions along the arch ring, as, for instance, at the crown and the springings. After the centring has been removed, the structure adapts itself to the new conditions until every joint is in equilibrium. Most of this adjustment occurs at the lead hinges, the movement at the other joints of the ring being very small. The movement that takes place is precisely similar to that described in Article

* "Theorie der Elastigen Bogenträger." Munich. 1879.

† "Zeitschrift des Architekten und Ingenieur Vereins zu Hannover." 1879.

‡ "A Treatise on Arches," by Malverd A. Howe, Professor of Civil Engineering, Rose Polytechnic Institute, New York, 1897.

§ "Zeitschrift des Osterr. Ingenieur- und Architekten-Vereines." 1895.

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V., p. 114. After the centring has been removed and the superstructure is completed the hinge joints are filled with cement, and the arch becomes fixed at the ends for any additional loading, including, of course, the live load.

A still more definite method of articulation recently applied to arch construction is exemplified by the Coulouvrenière concrete-steel bridge at Geneva, having a hinge at each springing joint and one at the crown consisting of convex steel bearings resting on concave steel sockets. The steel bearings are situated at the centres of the respective joints, and this mode of construction definitely fixes the position of the equilibrium polygon at the springing joints and at the crown.

The following is a simple graphical method for the treatment of a symmetrical three-hinged arch, with a hinge at each end and one at the crown.

Let A B C in Fig. 70 represent any arch having three hinges, at A, B, and C respectively. Then there can be no bending moments at A, B, or C and the reaction R_1 which is the resultant of V_1 and H_1, will pass through A, and the reaction R_2, the resultant of V_2 and H_2, will pass through C. For a single vertical load W, on the left half of the arch, the reaction R_2 must also pass through B, as there can be no bending moment at that point.

Here H_1 H_2 represent the horizontal thrust at the left and right supports respectively, and V_1 V_2 the vertical reaction at the left and right supports respectively. The determination of these forces is readily effected. From the hinge C draw C B and produce it to intersect W at the point D, and from the hinge A draw A D. Then, by resolution of the forces meeting at D, the values of H_1 V_1 and H_2 V_2 can easily be determined.

Three-hinged masonry arches have been built in Germany in spans of 150 ft. or more, with considerable advantage, as, the calculations being simple, it is safe to work very closely to the theoretical dimensions. In forming the hinges Mr. Liebbrand of Stuttgart employs lead plates about 1 in. thick extending over the middle third of the selected bed joints. If the pressure on the lead is uniformly varying, the centre of pressure must be within the middle third *of the lead*, or, in other words, it cannot deviate from the centre of the bed joints by more than one-eighteenth of its depth. In any case, the line of pressure is confined at the lead hinges within very narrow limits, but the restricted area on which the pressure acts involves much greater stress intensity than has hitherto been usual in masonry arches. In the Würtemburg hinged arches the limit of 110 tons per sq. ft. was allowed, which is about double the limit for the arches with fixed ends at Cologne and Coblentz.

Before closing this brief discussion of the elastic arch, it will be interesting to refer to some tests mentioned in the well-known report of the Austrian Society of Engineers and Architects.

Those tests, of special interest from our present point of view, were made upon three arches, of stone, concrete, and brick respectively. In each case the span was 75·4 ft., the clear rise 15·1 ft., and the width 6·56 ft.

(*a*) The first of these arches was built of rough quarry stone laid in 1 : 2·6 Portland cement mortar, and the test was made fifty-one days after completion. The thickness of the ring at the crown was 23·6 in., and at the springings 43·3 in. Loading was applied vertically at five points, dividing the half span into five equal parts. The arch failed under a load of 660 lb. per sq. ft. over one half of the span, when radial cracks appeared at the extrados near the skewbacks on the loaded side and over the haunches on the unloaded side.

(*b*) The concrete arch was built of segments of concrete of different mixtures, and at the springings the joints were filled with asphalte about ½ in. thick. The thickness of the ring at the crown and at the springings was 27·6 in. Loading was applied vertically, and the arch failed under a load of 742 lb. per sq. ft. over one half of the span.

(*c*) The brick arch was of the same dimensions as the stone arch, and failed in a similar manner under a load of 602 lb. per sq. ft. applied over one half of the span.

Careful measurements were made of all deformations following the removal of the centring, and due to temperature changes and to alterations of the loading. The appearance of the first crack and the corresponding load were duly recorded, and on the arches being tested to destruction, the load causing failure was determined. From the records so obtained a careful comparison with theory was made, from which we note the following points:—

(1) In the stone and brick arches failure took place in the joints by separation of the mortar, the adhesive strength of which was 120 lb. per sq. in. for stone and 70 lb. per sq. in. for brick.

In the concrete arch the average ultimate strength of the concrete was 290 lb. per sq. in.

(2) In the stone and brick arches the ends proved to be practically fixed on the loaded side and very nearly fixed on the unloaded side.

In the concrete arch with asphalte joints at the springings, the ends proved to be slightly articulated, and the theoretical results were taken as the mean of those obtained by treating the arch (*a*) as fixed and (*b*) as hinged.

(3) The following conclusions among others drawn from these tests were that the masonry arches behaved sensibly as elastic arches fixed at the ends; and that the method of loading employed constituted a strong argument in favour of the method of spandrel construction, which is illustrated in Fig. 68.

The dimensions in Table VII. are based upon the same report. If the width of the arch at the crown is small it is recommended that the width at the springings should be one-twentieth greater. For railway bridges it is advised that the track should be at least 3 ft. 4 in. above the crown, the intervening space being filled with material suitable for absorbing vibrations.

TABLE VII.—DIMENSIONS FOR STONE AND BRICK ARCHES.
(Calculated from the report of the Austrian Society of Engineers and Architects).

Span.	Thickness of arch ring.			Width (minimum).
	Crown.	Skewbacks.		
		Segmental.	Semicircular.	
Feet.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
100	3 8	5 6	6 3	8 0
150	5 3	7 10	9 0	11 4
200	6 8	10 0	11 4	14 0
250	8 4	12 6	14 2	17 6
300	10 0	15 0	17 0	21 0
350	12 0	18 0	20 4	25 0

ROYAL COMMISSION ON LONDON TRAFFIC.

THIS Commission resumed its sittings on Thursday last week, under the Presidency of Sir David Barbour.

Sir Robert Hunter, the Solicitor to the Post Office, gave evidence at some length, dealing with the powers possessed by the Postmaster-General in regard to the opening up of streets. Those powers were derived from the Telegraph Acts, or were the powers conferred by Parliament on the old telegraph companies in 1863, subject to certain extensions and modifications sanctioned by subsequent legislation. Generally speaking it might be taken that gas and water companies had the right to open and break up streets after a certain notice to the local authority, whereas the Postmaster-General could not take up any street for the purpose of placing telegraphs under it without obtaining the consent of the local authority. The proceedings which the Postmaster-General was compelled to take were much more cumbrous than those applicable to gas and water companies. When leave had been obtained to place a telegraph under a street, it could be maintained without further consent. Except in cases of emergency the Postmaster-General had to give ten days' notice, and conduct the work under the supervision of the road authority. No more than one-third of a roadway could be closed at one time. Although the Postmaster-General was bound to make good the road, it was generally found that the road authority preferred to do the work themselves. The streets of London had been broken up very considerably during the construction of the Post-Office telephones, but now the only reason for breaking up was to connect a new subscriber, and that necessitated breaking up only a small portion of the pavement. In the opinion of the Postmaster-General, the Post Office was not subject to the City Sewers Act of 1848.

Mr. John Gavery, the Engineer-in-Chief to the Post Office, said that he designed the telephone system of London. The work was done on such a scale as would provide for the needs of London for some time to come. Taking the City, Mayfair, Hampstead, Westminster, and Kensington districts, underground ducts had been constructed for nearly 60,000 subscribers. Witness then described the method of constructing the ducts. The ducts were of earthenware, laid in concrete, in the principal thoroughfares where the cables were likely to be large in number, and of iron pipes in the streets where the number was likely to be smaller. The average depth at which they were laid was 2 ft. 6 in. from surface to top of concrete. The number of ducts ranged from six to ninety, and each main duct was designed to contain one cable which would hold from 217 to 306 pairs of wires, serving an equivalent number of subscribers. From these main ducts branch pipes were led out to the adjoining premises.

Questioned as to the possibility of carrying out work during the night, witness said that he did not consider that such a course was practicable; neither would it be practicable, in his opinion, to endeavour to carry out such work simultaneously with work carried out by other authorities.

On Friday evidence was given by Mr. Alfred Willis, formerly general manager to the South Eastern and Chatham Railway Company, and a director of the Baker-street and Waterloo Railway. It was too late in the day for Parliament, or any other tribunal, to lay down any general scheme for providing railway accommodation or traffic facilities within the metropolis. The present congested state of the streets was very greatly due to the various improvements going on in London which involved heavy cartage through the streets, so that in the future he looked forward to a diminution of the traffic. He was not in favour of tramways in the City or the West-end. On the whole the requirements of the City and West-end were substantially met by the existing and projected tubes and omnibuses. The best means of providing for suburban requirements was to encourage railway companies to supplement their services with tramway connexions as feeders. With regard to the establishment of a tribunal, witness suggested an amalgamation of the lay members of the Railway and Canal Commission and the Light Railway Commission, with the addition of a traffic expert, and an engineer; or such a tribunal might be made a new department of the Board of Trade. In the course of further evidence, witness criticised the present Parliamentary procedure in regard to private bills.

Mr. Herbert T. Scobel, a Professional Associate of the Surveyors' Institution, was then called, and dealt at considerable length with the subject of the transference of manufactories from congested town areas to suburban or rural districts, and its effect on traffic.

WESTMINSTER CITY COUNCIL.

The first meeting of this Council since the Easter recess was held on Thursday last week at the City Hall, Charing Cross-road.

It was agreed that the application of the City Engineer and Surveyor to be allowed to act as Vice-President of the Engineering and Building Construction Section of the Royal Institute of Public Health be acceded to.

Drainage Work.—The General Purposes Committee reported having considered a presentment from the Works Committee, stating that they had had a letter before them from the Royal Institute of British Architects on the subject of the by-laws recently made by the London County Council under the Metropolitan Management Acts, with regard to the deposit of plans, sections, and particulars of drainage work, and calling attention to the great trouble and cost involved in complying with the by-laws in connexion with any but the smallest building. The Works Committee were in accord with the views expressed by the Institute, and the General Purposes Committee recommended: "That a communication be addressed to the County Council requesting them, in the interest of the building public, to modify the by-laws referred to." This was agreed to.

By-laws for Houses Let in Lodgings.—A report was presented, dealing with a communication from the London County Council referring to decisions of the High Court as to certain by-laws as to the cleansing of houses let in lodgings being invalid, as they did not provide for notice to be given before action was taken. The General Purposes Committee stated that they had caused a communication to be addressed to the Local Government Board inquiring whether, in view of the decisions, they had drawn up a model clause to meet the necessity.

Sanitary By-laws and Government Property.—The General Purposes Committee reported having received a letter from the Islington Borough Council with reference to the exemption of Government buildings from sanitary by-laws. The Islington Council had passed a resolution, urging the Government to place Government buildings on the same footing as other buildings with regard to such by-laws. It was resolved to acknowledge the receipt of the letter.

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Parliament-street Convenience.—The Works Committee, in a somewhat lengthy report, dealt with the steps to be taken to give effect to the order of the Court of Appeal in the case of the London and North-Western Railway *v.* the Westminster City Council, with reference to the eastern entrance and approach to the Parliament-street convenience. An injunction was granted requiring the Council to remove so much of the subway as is in the portion of the subsoil of Parliament-street, which is vested in the Company as owners of 35, Parliament-street, and is unnecessary for the purpose of an approach to the convenience. The Committee recommended, and the Council agreed, that steps be taken for the shortening of the opening in the street from its present length of 33 ft. 2 in. to 25 ft. 9 in., the placing of the staircase wholly in the roadway, and the reduction of the width of the passage from the staircase to the women's convenience from 10 ft. to 4 ft. 6 in. so far as it is in the Company's land.

Parapets, Cornices, etc.—A letter from the London County Council had been considered by the Works Committee, with reference to accidents which had occurred through portions of parapets, cornices, and copings of buildings becoming defective and falling into the street. As, however, the City Council had no jurisdiction in the matter, they merely submitted the letter for the purpose of drawing public attention to the subject.

Widening of Charing Cross Railway Bridge.—The drawings of certain works to be carried out in Villiers-street by the South-Eastern Railway had been considered by the City Engineer, who reported that the plans showed the proposed building line in Villiers-street in connexion with the widening of Charing Cross Railway Bridge, which was in accordance with the Parliamentary plans. The present plans referred only to the building line, and further plans will have to be deposited and dealt with in connexion with the new foot bridge to be constructed, and the widening of the railway bridge. The plans were approved.

OBITUARY.

MR. ANDREW KERR.—Mr. Andrew Kerr, Architect and Surveyor to the Mansion-house, Greenock, died on the 25th inst., at his residence, 21, Union-street, Greenock, in his fifty-seventh year. Deceased was a native of Edinburgh.

GENERAL BUILDING NEWS.

CHURCH OF ST. HILDA, OLD TRAFFORD.—The Church of St. Hilda, Old Trafford, has been built from the designs of Mr. F. P. Oakley, architect, the contractor being Mr. W. Thorpe, Cornbrook, Manchester. A portion only of the church has been built, consisting of the chancel and part of the nave and aisles, with a temporary west end of brick. On the south side is an organ transept with a vestry on the ground floor. On the north side is a shallow transept with a double gable outside, and the north aisle is continued along the north side of the chancel to form a morning chapel, the east end of which is only temporary. There is no clerestory or chancel arch; the main roof is, therefore, continuous from end to end over the nave and chancel, both of which are of the same width, viz., 22 ft. The aisle roofs are of flatter pitch than that of the nave, and rest on high aisle walls containing large windows. The floor of the nave and aisles is laid with red deal blocks, on which the seats stand at the same level as the gangways. The chancel floor is of plain small red tiles, with a narrow coloured border, and the floor of the sacrarium is of black and white marble. The nave floor is arranged with a slope of about 6 in. from west to east. When completed there will be accommodation for a congregation of rather over 650. The part now built provides accommodation for 467. The cost of the building so far has been about 4,400*l.* To complete the church, not including the tower, will probably cost another 2,500*l.*

PRESBYTERIAN CHURCH, LONDONDERRY.—The plans for the erection of a new Presbyterian Church for the Park-avenue congregation have been completed by Mr. M. A. Robinson, architect. The contract has been secured by Mr. Robert Colhoun. The interior of the building will be 63 ft. long by 45 ft. wide, and is designed to seat a congregation of about 500 people on the ground floor, additional accommodation being available in future, if required, by the introduction of side galleries.

CONGREGATIONAL CHURCH, SUNDERLAND.—A new Congregational Church for the worshippers who used to attend the Dundas-street Church, Monkwearmouth, was opened on the 13th inst. at Roker. The new church has been built of Hancoat pressed bricks, with stone dressings; it is Gothic in style and will seat about 520 persons. The main entrance is in Forster-street, with a door into the north transept in Roker Baths-road. The church is entered through an outer porch and inner vestibule. The roof is on the hammer beam principle, covering the whole width of the building—43 ft.—in one span. The height from floor to ridge is 41 ft. In the ridge are placed Messrs. Boyle's patent concealed air-pump ventilators. The windows are fitted with leaded cathedral glazing, with ornamental heads, and are the work of Mr. T. B. Goldstone, of Sunderland. The chancel has a frieze under the ceiling of ornamental plaster panels, while the windows are treated in a more decorative manner than those in the body of the church. The pulpit stands on six small columns on a plinth, having carved Gothic panels. The work has been carried out by Mr. H. J. Wootton, of Newcastle. The heating of the building is effected by means of hot-water pipes and radiators, and has been carried out by Messrs. R. T. Vaux and Son. The contractor is Mr. J. B. Stott, Monkwearmouth, and the whole of the work has been carried out to the designs and under the superintendence of Messrs. Joseph Potts and Son, architects, Sunderland.

WESLEYAN CHURCH, MUSWELL-HILL.—The foundation stones of a new Wesleyan church, which is to be erected in Colney Hatch-lane, Muswell-hill, were laid on the 21st inst. Mr. W. H. Boney is the architect. It is estimated that the total cost, including the site, will exceed 6,500*l.*

NEW BAPTIST CHURCH, STOCKTON.—The opening of the new Baptist Church at the corner of Bowesfield-lane and Lightfoot-grove, Stockton, took place recently. The edifice has been designed by Mr. T. W. T. Richardson, architect, and comprises a nave, 72 ft. long and 25 ft. wide, with aisles on both sides 12 ft. 6 in. wide, making a total width of 50 ft. Over the vestibule is a gallery to accommodate seventy-six persons, and the church will seat 600 people altogether. The contract has been carried out by Mr. John Davison, whilst the heating apparatus has been supplied by Messrs. Blakeborough and Rhodes, Ltd. The cost of the work has been 4,000*l.*

PROPOSED WESLEYAN CENTRAL HALL, LIVERPOOL.—A site has been acquired in Renshaw-street, Liverpool, for the purpose of erecting a new Wesleyan Central Hall. Messrs. Bradshaw and Gass, of Bolton and London, have been appointed architects of the new hall, and the contract has been placed in the hands of Messrs. William Brown and Son, contractors, of Salford. Through an entrance and crush hall the grand staircase leads to the great hall, which gives accommodation for about 2,500 people, with a platform and orchestra. There is a small hall, seating over 700 people, entered from the street level, for smaller meetings. Clubrooms for men and women and for young men in the business houses in the city are provided. There are a café and supper-room, drill hall, and a lads' club, specially arranged for the use of the boys' brigade and for the Sunday school scholars. Provision is made for the administration of the mission, with rooms for the ministers and assistants, the lady workers, and the lay and clerical agencies connected with the missions in various parts of the city. Shops and offices are to be provided. The estimated cost of the building, exclusive of site, is 45,000*l.*

MISSION HALL, DERBY.—The opening of a new mission hall in Boyer-street, Derby, took place recently. The new building has seating accommodation for 380 people, with twenty additional seats in the chancel and baptistry. The total cost of the undertaking has been 1,600*l.* The architects were Messrs. Naylor and Sale, of Derby, and the builder Mr. Alfred Smith, also of Derby.

PROPOSED CHURCH HOUSE, BANBURY.—At a meeting of the Church House Site Committee, held at the Vicarage, of the Banbury Parish recently, it was decided to commence the work of erecting the proposed Church House, at the north end of the Horse Fair. Tenders for the work were received from three local builders, the lowest being that of Mr. J. S. Kimberley, the amount of which was 3,540*l.* The architect is Mr. W. E. Mills. The building is to be in the Tudor style. The roofs are of red tiles. The large hall extends north and south. It is 62 ft. by 31 ft., excluding the platform, which is 30 ft. wide by 15 ft. deep. The height of the hall, which has a dome-shaped plaster ceiling, is 25 ft. 6 in. in the centre. At the back of the large hall a suite of small apartments is arranged.

GRAMMAR SCHOOL, ORMSKIRK.—The memorial stone of the extension of the Ormskirk Grammar School was laid on the 13th inst. The extensions will considerably increase the size of the buildings, and will provide accommodation for 125 mixed scholars. The existing building is being converted into chemical and physical laboratories, with lecture-room, store for balances, etc. The new building is two stories in height, and consists of central hall, with five class-rooms arranged round same, large room for advanced art, music-room, and two practising-rooms, lavatories and cloak-rooms for boys and girls, and rooms for assistant master and mistress. The principal elevation to the road is faced with local stone from the same quarry as that in the existing building, the other elevations being in St. Helens bricks. The ventilation will be carried out by means of Tobins' inlet tubes and Boyle's extractors, assisted by extractors into flues in chimney stacks, and the heating will be by low-pressure hot water by means of radiators. The new work has been designed to harmonise with the existing structure, which is of a Gothic character, the architect for the work being Mr. Frank Rimmington, of Liverpool. The work is being carried out by Mr. James Whittle, of Ormskirk, at a total cost, including furniture, of 5,000*l.*

GIRLS' SCHOOL, HAMMERSMITH.—On the 15th inst. the Princess of Wales opened St. Paul's Girls' School, Brook-green, Hammersmith. The building is of red brick with stone embellishments, above the entrance being reliefs representing the Tree of Knowledge and the Tree of Life; while there is a niche for a statue of Dean Colet, the founder of St. Paul's School in 1510. In another niche will be placed the arms of the Mercers' Company, by whom the new school has been built and endowed. There are also reliefs representing science and art by Mr. H. Pegram, the sculptor. The new school has been erected from designs by Mr. Gerald C. Horsley. There is accommodation for some 400 girls, and the cost has been 60,000*l.* Illustrations of the school were given in our issues of May 31, 1902, and August 29, 1903.

NEW WESLEYAN SCHOOLS, SOUTHPORT.—New schools were recently opened in connexion with the Southbank-road Wesleyan Church, Southport. The plans have been prepared by Mr. E. Gill, architect, Bury. The total cost of the work has been 5,000*l.*

BANK, LOTHBURY, CITY.—The new London and Provincial Bank at the junction of Lothbury and Old Jewry covers an area of 5,800 sq. ft. The building consists of two basements below the ground floor, the latter being occupied by the principal office, while there are four floors above. The new premises are faced with Portland stone and backed with white glazed bricks. The design is of the Renaissance character. The new premises have cost about 55,000*l.* The architect is Mr. Arthur Blomfield, the architect to the Bank of England, and the contractors were Messrs. W. Cubitt and Co., Gray's Inn-road. The electrical work has been done by Messrs. Strode and Co., electrical engineers, under the superintendence of Mr. Bernard Drake, the electrical adviser to the Bank of England. The lifts have been constructed by the Otis Lift Company, and the strong-rooms by Messrs. Chubb and Co. The heating and ventilation have been furnished by Messrs. R. Crittall and Co. from the designs and under the superintendence of Mr. E. Wingfield Bowles, consulting engineer. The mosaic floors have been laid by Messrs. Rust and Co., while the fittings are the work of the contractors.

ROYAL WATERLOO HOSPITAL FOR CHILDREN.—The new buildings for this hospital are being carried out in three sections to avoid interference with the working of the existing hospital. The present out-patients' department, now located on a portion of the site, will not be disturbed until the first section of the new building is complete. The new hospital, when fully completed, will contain provision for about 200 beds, with a separate nurses' home. The portion now in progress will provide for about 100 beds, and the out-patients' department, which will occupy the whole of the lower ground floor, will be approached from Waterloo Bridge-road, with separate entrances and exits. The ground floor will contain the administrative offices, with accommodation for secretary, committee, matron, resident medical staff, waiting-rooms, hall, and entrance-porch, situate at the corner of Waterloo-road and Stamford-street. The first, second, and third floors will be devoted to the wards. Each ward has an open balcony facing Waterloo-road, with separate sister's room and ward scullery. The bath-rooms and sanitary offices are separated by a ventilated corridor on each floor. Provision is made for a day-room on the first floor, an isolated ward on the second floor, and operating theatre on the third floor. The fourth floor is reserved for the kitchen offices and bed-rooms for the staff. A hydraulic patients' lift and service lifts will travel from top to bottom of the building. The floors are of fire-resisting construction throughout. Hydrants, with fire hose, will be

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attached to each landing, and an iron escape staircase will be provided outside with exits from every floor. The heating will be by hot water, and electric light will be provided throughout. The contract for the buildings now in progress, viz., the first two sections, is 30,000*l.*, and the total cost will amount to about 50,000*l.* The front of the new buildings will be red brick and terra-cotta. The corner entrance-porch will be of glazed ware, the cost of which is being defrayed by Messrs. Doulton and Co., as a gift to the hospital. The contractors are Messrs. Holliday and Greenwood, and the architects Messrs. Waring and Nicholson.

NEW ASSEMBLY BUILDINGS, BELFAST.—The new Assembly buildings in Fisherwick-place, Belfast, are now in an advanced state of progress. The contractors are Messrs. Robert Corry, Ltd.; the architects, Messrs. Young and Mackenzie, while the lighting and ventilating are being carried out by Messrs. Musgrave and Co., Ltd.

PROPOSED ALTERATIONS TO THE SHIRE HALL, NOTTINGHAM.—At a meeting of the Notts Standing Joint Committee, held in the Shire Hall on the 9th inst., the question of the proposed alterations came under consideration. Mr. E. P. Hooley, the County Surveyor, presented a report, in which he stated that up to the present twenty-two rooms had been added to the Shire Hall at a total cost of about 6,000*l.* in fifteen years, and the rooms had been rearranged as circumstances had arisen. The proposed new block will consist of three stories, the ground floor being devoted solely to police purposes. It is to contain an entrance and waiting hall, leading out of which is to be the charge office, and from this room access will be obtained to the prisoners' cells. Between the cells and the adjoining property an airing court is to be provided. The office for the Deputy Chief Constable is to be on the opposite side of the waiting hall, and from the same side a passage will lead to a store, lavatory accommodation for constables, and a guard-room. A motor-car shed, with a small store and workshop adjoining, is provided for in the rear. On the first floor will be erected a suite of offices for various county officials. These offices may be approached two ways, viz., either directly from High Pavement by means of the staircase in the waiting hall on the ground floor, or through the Shire Hall by continuing the corridor by the side of the civil court. This floor is to contain offices for the Chief Constable and his staff, and the Magistrates' Clerk and his staff, besides a spare office and a small committee room. The top floor is to be devoted to providing accommodation for the resident sergeant, and quarters for single men, which may be approached by a separate entrance and staircase from the roadway. The five offices in the Shire Hall which would be vacated by the Chief Constable and the Magistrates' Clerk would then become available for the accommodation of the Clerk to the County Council and his staff. The estimated cost of the work is 8,000*l.* After some discussion, the consideration of the matter was deferred.

CO-OPERATIVE LAUNDRY, BRADFORD.—The laundry, recently built by the City of Bradford Co-operative Society, Ltd., at Barnard-terrace, Usher-street, has just been opened. The building, which was erected from the plans of Messrs. Rycroft and Firth, of Bradford, under the supervision of Mr. F. Moulson, the Society's clerk of works, has cost 6,000*l.*, and the machinery 2,500*l.* The following is a list of contractors:—Mason's work, Messrs. Charles Booth and Son; joiner's work, Messrs. E. Fearnley and Sons; plasterer, Mr. Andrew Taylor; slater, Mr. G. H. Wilkinson; plumbing, Messrs. J. and A. Clapham; painting, Mr. William Cockcroft. The machinery is by Charles Bell, of Bradford; W. Summerscales and Sons, Ltd., of Keighley; and T. Bradford and Co., of London and Manchester.

POLICE COURT, ETC., BUILDINGS, SUNDERLAND.—A Local Government Board inquiry was conducted at the Sunderland Town Hall on the 20th inst. by Colonel A. G. Durnford, R.E., into the aplication of the Sunderland County Borough Council for leave to borrow 50,170*l.* for the purpose of providing Quarter Sessions and police-court buildings, police and fire-brigade stations, etc. The Town Clerk (Mr. F. M. Bowey) presented the case of the Corporation, and said that the cost of the land for the proposed new buildings was 7,720*l.*, and the cost of the buildings themselves 42,450*l.* Mr. Wm. Milburn explained the plans of the proposed new buildings in detail, mentioning that they had received the approval of the Home Office. There was no opposition, and the inquiry was closed.

THE "OLD RED BULL," MORPETH.—The "Old Red Bull" Inn, at Morpeth, which had been pulled down, has been re-erected on the same site. Mr. R. Charlton Hall was contractor, and the sub-contractors were Messrs. M. Routledge, joiner; T. Daglish, plumber; T. W. Athey, slater and plasterer; T. Dick, painter; all of Morpeth; and the electric light was installed by Messrs. Rowland Barnett and Co., Newcastle-on-Tyne. The architect was Mr. L. A. Soames, of Morpeth.

BILLIARD HALL, WINDSOR, BELFAST.—A new billiard hall has been erected in Belfast for the Windsor Recreation Club. The premises have been built from the plans of Messrs. Blackwood and Jury, architects, and the cost has been 400*l.*

STAINED GLASS AND DECORATION.

STOREY MEMORIAL WINDOW, PARISH CHURCH, LANCASTER.—The new window, recently placed by his family in the west-end of the south aisle, to the memory of Sir Thos. Storey, contains four figures of personages from the Old Testament—Abraham, David, Job, and Tobit. These stand under canopies, corresponding in style with the stonework of the window; and below them, within an architectural base canopy, are small subjects from their lives, illustrating four of the acts of mercy. Below, the figure of Abraham is the scene of his entertaining the three angels, illustrating: "I was a stranger, and ye took me in." Under that of David, the mighty men bring the water from the well at Bethlehem: "I was thirsty, and ye gave me drink." Beneath the figure of Job, his care for the widow and fatherless: "I was hungry, and ye gave me meat," Job xxxi. 17; and below Tobit, his clothing the naked of his countrymen, during the captivity. The names of the four saints are written largely across the base of the window, and on small scrolls at the feet of each are texts bearing on their characters. In the eight principal openings of the tracery are angels holding a scroll, with the first and third verses of the CXII Psalm: "Blessed is the man that feareth the Lord, that hath great delight in his commandments. Riches and plenteousness shall be in his home: the righteous shall be had in everlasting remembrance." The window has been executed by Messrs. Shrigley and Hunt, of Lancaster.

NEW WINDOWS, EXETER CATHEDRAL.—A memorial window, consisting of three lights and tracery, has just been executed by Messrs. Percy Bacon and Brothers, of London, and placed in Exeter Cathedral, to the memory of Dr. Blackmore, the author of "Lorna Doone," etc., etc. The lights contain three figures, representing Jonathan, David, and Samson. The figures are treated in a much more free and natural style than is usual in stained-glass design for churches; the heads of the figures are relieved against a background of foliage, amid which is a scroll containing the name of the figure beneath. Judging from the illustrations in black and white sent to us, the windows are very successful, and form a very suitable memorial to Blackmore.

APPOINTMENTS.

THE NEW ROYAL COLLEGE OF SCIENCE, DUBLIN.—The Commissioners of Public Works, under authority given by the Lords Commissioners of His Majesty's Treasury, and with the concurrence of the Department of Agriculture and Technical Instruction, have appointed Mr. Aston Webb, R.A., President of the Royal Institute of British Architects, and Mr. T. Manly Deane, A.R.H.A., C.E., of Dublin, to be architects, jointly, of the New Royal College of Science, of which the foundation stone was laid by His Majesty the King on the 28th inst.

SURVEYOR, MAIDSTONE TRUSTEES OF THE POOR.—The first meeting of the newly-constituted body of Trustees was held at the Town Hall, Maidstone, on the 19th inst., Ald. W. Morling, the Mayor, presiding. The clerk reported that he had received five applications for the post of Surveyor to the Trustees, as follows:—Mr. Walter Cox, 22, Stone-street, Maidstone; Mr. William Day, jun., 23, High-street, Maidstone; Mr. A. J. Waterman, 20, Week-street, Maidstone; Mr. A. W. Smith, Week-street, Maidstone; and Mr. J. Tootell, 13, King-street, Maidstone. It was decided that the election should take place by ballot, and the result of the voting was as follows:—A tie between Messrs. Cox and Day, with fourteen votes each. There was, however, one spoilt voting paper, and the Mayor decided on a fresh vote. This was taken, with the result that Mr. Cox was elected by the majority of one vote; the figures being Mr. Cox fifteen, Mr. Day fourteen.

SANITARY OFFICERS.—The Local Government Board has sanctioned the following appointments:—Battersea—Mr. A. Peverett, as sanitary inspector in place of Mr. A. Chuter. Greenwich—Mr. G. J. Bridel, temporary reappointment as sanitary inspector. Southwark—Mr. H. Abson as sanitary inspector in place of Mr. H. King.

SANITARY AND ENGINEERING NEWS.

BYFLEET SEWERAGE.—The Chertsey Rural District Council have received a report on the Sewerage and Sewage Disposal of Byfleet, Surrey, from Messrs. Elliott and Brown, of Nottingham. The scheme comprises seven miles of sewers, with pumping station, and bacterial purification works. The estimated cost of the works is 18,992*l.*

FOREIGN.

FRANCE.—At Paris the work is shortly to be commenced for the opening of the Boulevard Raspail, between the Rue de Vaugirard and the Boulevard Montparnasse.——It is announced that the government intend to acquire the Palais de Castille, in the Avenue Kléber, in order to fit it up as a lodging for Royal personages *en route* through Paris.——The jury in the competition for new schools and other municipal buildings at St. Denis, have awarded the first premium to MM. Piate' and Roy.——It is proposed to erect at Nancy a group of buildings intended to include a Bourse, a Chamber of Commerce, a lecture-hall, and a club.——A new hospital for incurables is to be built at Lille.——The jury in the competition for a public abattoir at Angers have awarded the first premium to M. Jules Blitz, architect, of Compiègne.——A new prison building at Evreux is proposed, at an estimated cost of about half a million francs.——A municipal theatre and art museum are to be built at Vannes.——A committee has been formed to erect at Nimes a monument to the architect, Henri Revoil, who restored the principal ancient monuments and ecclesiastical buildings of the South of France. He completed and decorated the cathedral of Marseilles, and rebuilt, to a considerable extent, those of Montpellier and Nimes.——The death is announced, at the age of sixty-one, of M. Edward Perronne, member of the Société Centrale des Architectes, and a divisional architect of the City of Paris.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The partnership between Mr. A. B. Houchin and Mr. R. P. Morris, practising as architects, surveyers, and valuers, under the firm of "Frend, Houchin, and Morris," Bloomsbury Mansion, Hart-street, W.C., is dissolved, and the practice will be carried on at the same address by Mr. A. B. Houchin, under the style of "Frend, Houchin, and Co."

PUBLIC WORKS AND BUILDING ESTIMATES FOR 1904-5.—The Civil Service estimates for the financial year ending on March 31, 1895, show for Class I. a net increase of 53,726*l.*, in the total estimate of 2,617,368*l.* required in respect of public works and buildings; the estimated expenditure upon revenue buildings, which includes the largest increase, namely 31,300*l.*, is mainly for new works, with alterations and additions of post office buildings. An increase of 4,330*l.* to be spent upon the Houses of Parliament comprises items of 3,000*l.* upon improvements of the ventilation of the House of Commons, and 900*l.* for constructing a lift to the Press Gallery. The Officers' Convalescent Home at Osborne, which appears for the first time in the votes, takes 15,100*l.*, of which amount 2,955*l.* is apportioned to the salaries and allowances of the house-governor, and the staff of nurses, etc. The total amount under the head of the Royal Palaces is 61,500*l.*, those which are in the personal occupation of the King absorbing 23,750*l.*, and 1,000*l.* will be expended upon building new wine cellars at St. James's Palace. The Royal parks and pleasure gardens entail an estimated cost of 104,100*l.*, a sum of 25,568*l.* out of that amount is for their maintenance, and another of 10,642*l.* for the provision of park-keepers and police in Green, Hyde, and St. James's Parks. The expenditure under the Light Railways (Ireland) Acts of 1899 and 1893 is calculated at 24,734*l.* during the financial year, as compared with 47,038*l.* during the preceding twelve months. The rates upon Government property show an increase from 571,697*l.* in 1903-4 to 592,277*l.* in 1904-5, representing an increase of 20,580*l.*

PROPOSED LIBRARY, ART SCHOOL, ETC., AT CHELMSFORD.—A Local Government Board inquiry was held in the Council Chamber, Chelmsford, on March 31, by Mr. E. A. S. Fawcett, an inspector of the Board, into the application of the Town Council for sanction to borrow 4,000*l.* for the proposed Science and Art School and Museum, and 6,950*l.* for the purpose of water supply, including the provision of a new reservoir at Long Stomps. The Town Clerk, Mr. T. Dixon, stated that the present assessable value of the Borough was 60,259*l.* The outstanding loans amounted to 45,603*l.*, and loans sanctioned, but not yet

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taken up, amounted to 7,571*l*. Alderman Chancellor explained that at the present time they had a museum intact as regarded exhibits and curios, but it was stored away in small rooms, and could not very well be inspected. The Science and Art classes, which the Council established some years ago at Crane-court, had increased to such an extent that the accommodation was quite insufficient. There were 245 students now attending the classes. It was, therefore, intended to build Public Library premises, which would combine a library, science and art school, and a museum. Mr. H. Potter's tender for the building was 5,315*l*. There would also be 400*l*. for fittings and bookcases, and 100*l*. for furniture. The total cost would be about 8,000*l*. Mr. Carnegie had offered 2,500*l*. on condition that 500*l*. was raised, and he (Mr. Chancellor) had now about 400*l*. of that amount. The County Council were giving 1,000*l*. In reply to the inspector, Alderman Chancellor said that he was the honorary architect of the proposed buildings. After some discussion regarding the new water supply, Mr. Cuthbert Brown, the Surveyor, said that the new reservoir with the old one would hold a three days' supply for the town.

THE AUCTIONEERS' INSTITUTE.—The annual general meeting of the members of the Auctioneers' Institute of the United Kingdom will be held at the offices, 57 and 58, Chancery-lane, London, on Thursday, May 12, at 2.30 p.m., to receive the annual report and accounts, to elect members of Council and auditors, and to transact other business. The eighteenth annual dinner will take place at the Hotel Cecil, London, on Thursday, May 12, at 6.30 p.m., under the presidency of Mr. J. H. Townsend Green. The Council will meet at the offices of the Institute on Friday, May 13, at 2 p.m., to elect President and Vice-Presidents, and to make the awards in connexion with the recent examinations.

PLUMBERS' EXAMINATION AT KING'S COLLEGE.—Twenty-three plumbers, applying for registration under the National Registration of Plumbers, attended at King's College on the 23rd inst. for examination by the Worshipful Company of Plumbers. The candidates were from various parts of London, and also from Cambridge, Dorking, Egham, Esher, Hemel Hempsted, Sevenoaks, Walton-on-Naze, and Windsor. The practical test included lead bossing and the making of plumbers' joints, etc. The examination questions included the subjects of contamination of drinking water from faulty connexions, roof covering, arrangement of bath, sink, and closet wastes, drainage of town houses, and disconnexion with sewers. The examiners were:—Mr. Joseph Johnson, Mr. Charles Thomerson, master plumbers, and Mr. W. Smeaton and Mr. F. Wyatt, representing the United Operative Plumbers' Association of Great Britain and Ireland. Five candidates succeeded in passing the examination.

INCORPORATED CHURCH BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday the 21st inst. at the Society's House, 7, Dean's-yard, Westminster, the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz., building new churches at Osmaston-by-Derby, St. Osmund, 80*l*., for the first portion; Thurlstone, St. Saviour, near Sheffield, 130*l*., for the first portion; and Upper Stratton, St. Philip, near Swindon, Wilts, 75*l*., for the first portion; and towards enlarging or otherwise improving the accommodation in the churches at Lynton, St. Mary, Devon, 30*l*.; Richmond, St. John the Divine, Surrey, 40*l*.; and Winchelsea, St. Thomas, Rye, Sussex, 25*l*. Grants were also made from the Special Mission Buildings Fund towards building mission churches at Colchester, St. Stephen, Essex, 40*l*.; and Newport, St. Luke, Mon., 100*l*. The following grants were also paid for works completed:—Lydbury North, St. Michael, Shropshire, 30*l*.; Chatham, St. Mary, Kent, 100*l*.; St. Crantock, St. Carantoc, near Newquay, Cornwall, 10*l*.; Cley, St. Margaret, Norfolk, 25*l*.; Gileston, St. Giles, near Cardiff, 20*l*.; Thornby-on-Tees, St. Luke, 70*l*.; and Grimethorpe, St. Luke, near Barnsley, 60*l*. In addition to this the sum of 326*l*. was paid towards the repairs of thirty-two churches from trust funds held by the Society. The Society likewise accepted the trust of sums of money as repair funds for the churches at West Derby, The Good Shepherd, and Walkden Moor, St. Paul, Manchester. The annual general court of the Society will be held on May 19, at the Church House, Dean's-yard, at 3 p.m. The chair will be taken by the Bishop of London.

THE EASTERN COUNTIES MASTER BUILDERS' ASSOCIATION.—On the 21st inst. the members of the Eastern Counties Master Builders' Association dined at Ipswich Town Hall, Mr. T. Parkington, President of the Association, in the chair. The Chairman, having submitted the loyal toasts, Mr. J. E. Ransome proposed "His Majesty's Imperial Forces," and Lieut.-Colonel Brigade-Surgeon Elliston and Mr. W. H. Bloomfield responded. Mr. Charles Wall, of London, then proposed the toast of "The Town and Trade of Ipswich," coupled with the names of the Deputy-Mayor and Mr. Edgar Catchpole. The Deputy-Mayor, in responding to the toast, said that no one knew better than the builders how a town was prospering. Mr. Edgar Catchpole also responded, and gave some reminiscences of Ipswich in his boyhood. The prosperity of Ipswich was due to the enterprise of the local firms, many of which had grown from small beginnings into firms of very great importance. Mr. Thomas Costigan, Secretary to the Eastern Counties Federation of Master Builders, then proposed "The Architects and Engineers," and paid a high compliment to the Mayor, remarking that a town could not do better than have at its head a successful and honourable builder. The business of an architect now was very much more complex than it used to be. Architects were not now merely designers. The engineers were a more recent growth, arising out of the difference in the methods of building now prevailing. A good feeling now existed, he thought, between the builders and the architects and engineers, and he hoped it would continue. Architects were the natural protectors of the builders, and builders had often a good deal to contend against. Mr. T. Cotman and Mr. Hy. Miller, C.E., replied. Mr. Wm. Grayston proposed "The Mayor," and said that the builders of the town felt that they ought not to allow the Mayoralty of one of their number, Alderman Bennett, to pass without some special recognition. They were all well acquainted with their guest, the Mayor. Since he was elected as a member of the Ipswich Town Council, he had an unbroken record, and his fellow members of the Association were gratified to find that additional honour had been conferred upon him last year, and to see him in the proud position he now occupied as Mayor of the Borough. Mr. Grayston went on to say that, before he concluded, he had a very pleasant duty to perform—namely, to present to the Mayor an illuminated address, signed by his fellow members of the Master Builders' Association. The address was in the following terms:—"To Ald. Fred. Bennett. We, the undersigned, master builders of Ipswich and district, beg to offer you our sincere and hearty congratulations upon your being elected by your fellow townsmen to the office of Chief Magistrate and Mayor of Ipswich, your native town. We beg to tender you our best wishes for your future health and happiness, and ask your acceptance of this address of the evidence of our unbounded esteem and respect." The address was signed by Mr. Thomas Parkington, President of the Eastern Counties Master Builders' Federation, the officers of the Ipswich and District Master Builders' Association, and thirty-one master builders. The address is the work of Mr. F. Anstead Browne (from the office of Messrs. Eade and Johns, architects, Ipswich). The Mayor said it had given him great pleasure to find that his fellow members of the Association were so well disposed towards him. Mr. E. J. Brown, ex-President of the London Master Builders' Federation, proposed "Success to the Ipswich and District Master Builders' Association," which was responded to by Mr. Chas. Borrett, Treasurer, and Mr. H. Carr. The Chairman proposed "The Visitors," coupling the toast with the names of Mr. J. E. Ransome, Mr. J. S. Corder, and Mr. George Fenn, who responded.

MAINTENANCE OF COUNTY ROADS.—The fifteenth annual report of the Highways Committee of the Gloucester County Council, states that fifteen years ago the County Council, as the result of the Report of a Special Committee, determined to take over and control the whole of the main roads of this county. This resolution entailed the disestablishment of sixty-six different road authorities, and, as might therefore have been expected, it was carried out in the face of considerable opposition and created some local irritation. This was, under the circumstances, more than natural, but it is satisfactory to note that gradually these feelings have died out. The assumption of control by the county has allowed of the introduction of one uniform system, and the resources of the county purse alone made possible the large expenditure entailed by the introduction of steam-rollers and the gradual carrying out of many important improvements. The expenditure is now equally distributed over the whole county, and the anomalies that existed fifteen years ago have disappeared. Such were these anomalies that in one district, if the county contribution had not modified the inequality, the roads would have necessitated a rate of 18½d. in the pound, whereas in another 1½d. would have sufficed. At the present moment, if the main roads were maintained out of county funds alone, a rate on the county of 10½d. in the pound would be required. The report goes on to state that several experiments have been made for the purpose of comparing the relative value of local limestone and granite or Clee Hill stone. "One fact has undoubtedly been established, and that is, that the use of steam-rollers has added to the life of a road coated with limestone, and as a result, the use of local limestone has been extended, though the concomitant disadvantages of extra mud and extra duct have to be taken into account."

INSTITUTE OF SANITARY ENGINEERS.—Examinations were recently held in London and Liverpool in "Practical Sanitary Science," to qualify for admission to the Institute. The following are the results. In London, fourteen candidates presented themselves; six passing, qualify for admission as Associates, viz., Osmond Catlin, R. A. Skelton, Thomas Henry Wilson, Harry Ernest Booth, Frank Brittain, and Harry Todd Brainsby. At the Liverpool examination, twelve candidates presented themselves, of whom six passed, qualifying for admission as Associates, viz., Arthur Holt, John Hatton, George Brocklesby, William Osborn Thorp, and Cecil Braham Goodyer, and James Fletcher.

CORPORATION OF LONDON (SOUTHWARK AND OTHER BRIDGES) BILL.—The Parliamentary Committee of the London County Council reported as follows at Tuesday's meeting of the Council:—By this Bill it was proposed to empower the Corporation of the City of London to pull down and rebuild Southwark Bridge and to stop up the high-level foot-bridge on the Tower Bridge. The Bill also contains provisions for extending the jurisdiction of the City Justices and the City Police over the Tower Bridge, London Bridge, Southwark Bridge, Blackfriars Bridge, and the approaches thereto. The preamble to the Bill recites that it is expedient that Southwark Bridge should be rebuilt; that the Corporation are seised of the Bridge House estates in trust for the maintenance and support of the four bridges named above, and that it is expedient that the Corporation should be authorised to raise the necessary moneys for the proposed rebuilding on the credit of the Bridge House Estates and of their estates and revenues. A petition, in order to safeguard the Council's position, was presented as authorised on January 26, 1904, and clauses and amendments were submitted as to the protection of the Council's tramways—at the southern approach to Southwark Bridge—the reconstruction of the bridge so as to permit of a conduit tramway being laid along it if subsequently sanctioned by Parliament; the power sought by clause 34 to make by-laws, the proposal in clause 54 to extend the City area, and other matters. The Bill came before a Select Committee of the House of Commons on March 15, 16, and 17, when numerous opponents appeared against it, and counsel also appeared in support of the Council's amendments. The Committee decided that, as far as the Bill related to the raising of the level of Upper Thames-street by 3 ft., they did not consider the Corporation had proved their case. In consequence of this decision the promoters obtained an adjournment of the matter in order to consider their position. We have now been informed that upon the recommendation of the Bridge House Estates Committee the Court of Common Council have resolved not to proceed further with the present Bill, and it has accordingly been withdrawn.

ARCHITECTURAL EXHIBITION IN LEEDS.—English architecture has had its ups and downs, but the last dozen years have seen a revival of the best traditions of the art—a revival which it is a matter of sincere hope will be no temporary awakening, but will be lasting and permanent. Anything that will conduce to that desirable end is to be welcomed, and as something calculated to act as an incentive to even further improvement—for the millennium in architecture has not as yet been achieved—the exhibition arranged by the Leeds Arts Club, at their premises, 18, Park-lane, should be gladly received by all true lovers of the art. Visitors to the exhibition will find there a selection of some of the best modern domestic architecture of the country, in the form of photographs and drawings, both in colour and black and white. The amount of local work available is small, and this, perhaps, is rather to be regretted, though any deficiency in amount—for the work is consistently good—is more than compensated for by the variety and extent of the exhibits from different parts of the country. In the exhibition are some examples of the work of Mr. Henry Wilson, Mr. Baillie Scott, Mr. Leonard Stokes, Mr. Halsey Ricardo,

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Mr. Detmar Blow, Mr. J. H. Mawson, Mr. Dunbar Smith, Mr. Cecil Brewer (London), Messrs. Penty and Sons (York), Mr. Edgar Wood, Mr. G. B. Bulmer (Leeds), Mr. W. H. Thorpe (Leeds), Messrs. Bedford and Kitson (Leeds), Messrs. Perkin and Bulmer (Leeds), Mr. A. A. Gibson (Harrogate), Mr. C. F. A. Voysey, Mr. Reginald Blomfield, Mr. Walter Millard (London), Mr. F. Rowntree (York), Mr. W. H. Brierley (York), Messrs. Howdell and Howdell (Leeds), Mr. Percy Robinson (Leeds), Mr. H. A. Chapman (Leeds), and Mr. A. E. Kirk (Leeds).—*Yorkshire Observer.*

YORKSHIRE FEDERATION OF MASTER BUILDERS.—A meeting of the Yorkshire Federation of Master Builders was held at the Builders' Exchange, Sheffield, on Thursday last week, when delegates from all parts of the country were present, including Mr. E. Good, President (Hull), Alderman Jessop and Mr. L. Ratcliffe (Huddersfield), Messrs. Ledgard and Wilson (Leeds), Messrs. Topham and Raynor (Harrogate), A. Lyons (Malton), Messrs. J. Marsden, J. Townsley, Beilby, and Councillor Scott, and G. Stanley, Federation Secretary (Hull); Messrs. W. R. Thompson, G. Smith, and Coope (Dewsbury), H. Fallis (Wakefield), Councillor England, G. Lindly, G. Mellor, and J. Smith (Barnsley), J. D. Cook (President of Sheffield Association), A. J. Forsdike, J. Biggin, Councillor J. Longden, A. Mastin, H. H. Hodkin, J. Vasey, Councillor Watson, and J. L. Taaffe (Secretary of Sheffield Association). After transacting business, the delegates adjourned to the exhibition, which, it was stated, is to be an annual affair.

CAPITAL AND LABOUR.

THE PAINTERS' STRIKE ON THE TYNE.—Regarding the shipyard painters' strike, the men state that one Tyne firm has conceded the 2s. advance, and that the men there have started work. It is further announced that the masters have asked for a conference with the men's delegates, and this will shortly be held. Half of the strikers of the Tyne district have, it is said, already secured employment, mostly at house work. At a conference recently it was decided by painters' representatives to lay certain proposals before the branches, with a view to the settlement of the strike.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

9,769 of 1903.—J. LEARMONTH, G. G. CALDERWOOD, and PLANET FOUNDRY COMPANY, LTD.: *Cast-iron Brackets for Pedestal Water-closets, and the like.*

This relates to means for increasing or decreasing the height or size of a cast-iron bracket for pedestal water-closets, and the like, consisting of removable collars or rings, and screws passing loosely through the same, also loosely through holes or openings in the lower edge of the bracket, and the collars and screws capable of being removed entirely; or of one or more of the collars being transferred to a point above the part to which each set is attached.

11,864 of 1903.—H. ROTHWELL and J. SLEDDEN: *Tiles for Walls, Roofs, and other surfaces.*

A method of providing tiles with an absorbent backing, which consists in applying a flux to the back of the tile, in then dusting powdered material, such as brickdust, or its equivalent, thereon, to a suitable depth, and in finally subjecting the tile to heat, whereby the said flux and powdered material amalgamate with the tile back in a sponge-like absorbent form.

26,262 of 1903.—D. W. TOWER: *Furniture Handles, Knobs, Tools, and like fittings.*

A securing device for furniture fittings, consisting of a revoluble-threaded member provided on its inner face, with projections, and a dished-washer having corresponding projections on its outer face, the inner face of said washer being provided with a plurality of wood engaging spurs at its flanged margin, the spurs serving by engagement with the wood to prevent turning movement of the washer in either direction.

26,342 of 1903.—R. W. H. RODNEY: *Locks and Latches.*

Locks and latches, consisting in the combination of a reversible latch bolt, having an inclined nose and a closed cam link, in which the follower works with one or more lock or latch mechanisms.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

81 of 1904.—C. DAHLSTROM: *Metallic Doors.*

A door formed of sheet metal, and having one sheet provided with a panel formation serving as one side of the panel and being recurved on opposite sides of the panel formation to form the stiles of the door, and another sheet forming the other side of the panel, and having its side edges connected with the side edges of the first-mentioned sheet.

767 of 1904.—R. C. HYLE: *Fireproof Structures.*

A fireproof construction, consisting in forming the support for the body of concrete of twisted wire cables anchored in opposite walls, and embedded in the body of concrete near the lower surface thereof as the latter is laid.

1,617 of 1904.—T. CREW: *Brick Kilns.*

Kilns for drying and burning bricks, which consist in connecting the inner flues with outside flues of an adjoining kiln or kilns, having branches extending under the furnaces communicating with the interior of the kiln.

2,923 of 1904.—F. WINKLWIEK and A. MISSIK: *Construction of Walls, Wall Coverings, ceilings, and the like.*

A method of constructing walls, wall coverings, ceilings, and the like, consisting in arranging a sheet-metal covered wooden backing behind a frame or lattice work, composed of iron bars, and arranged in the central plane of the wall, or the like, to be erected, a mortar of gypsum, broken or pounded slag, water and glue being then applied until the desired thickness of wall, or the like, is obtained.

3,806 of 1904.—M. KOHL and B. NOLDNER: *Apparatus for Manufacturing Cement Pipes, and the like.*

An apparatus for manufacturing cement pipes, and the like, consisting in the combination of an outer casing and an inner core, with a pressing-piece having a curved pressing-surface arranged on the core or the casing, and this curved surface becoming gradually farther from the centre of the core.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 13.—By MADDISON, MILES, & MADDISON (at Great Yarmouth).

Yarmouth, Norfolk.—7, Euston-rd., u.t. 40 yrs., g.r., etc., 1*l.* 7s., p. £395
Runham, Vauxhall, piece of building land, f. 100

April 14.—By W. & S. FREEMAN [(on the premises).

Notting Hill.—1A, Codrington-mews, beneficial lease for 14 yrs., y.r. 52*l.*, with goodwill.. 131

April 18.—By CLARKE & CO.

West Kensington.—205, North End-rd., f., y.r. 135*l.* 1,450
207 to 215 (odd), North End-rd., f., y.r. 280*l.* 3,890
2 and 4, Beaumont-cres., f., y.r. 100*l.* 1,270

By FRANCIS DOD & CO.

Plaistow.—93 to 115 (odd), Upperton-rd., u.t. 96½ yrs., g.r. 72*l.*, w.r. 374*l.* 8s. 1,610

By MAPLE & CO.

Euston-road.—Nos. 208 to 228 (even), (including the "Douglas Hotel"), f., e.r. 1,075*l.* 14,290

By T. WOODS, jun.

Hounslow, Middlesex.—High-st., The Town Hall, f., y.r. 250*l.* 4,550

By DEBENHAM, TEWSON, & CO., with T. LAVINGTON (at Swindon).

Ogbourne St. George, Wilts.—Freehold enclosures of land 47 a. 0 r. 37 p. 300
Enclosures of land, 32 a. 2 r. 3 p., part f. and part u.t. 113 yrs., g.r. nil 300
"Lower Yielding" enclosure, 39 a. 3 r. 0 p., part f. and part u.t. 113 yrs., g.r. nil 310

By T. LAVINGTON (at Swindon).

Ogbourne St. George, Wilts.—"Moore's Wood," etc., 43 a. 3 r. 2 p., f. 370
Cottage tenement and 1 a. 2 r. 11 p., f. 300
Tenement smithy and 0 a. 2 r. 10 p., f. 235
"Landy Cottage," f. 180
Five tenements, part f. and part long leasehold 285
Enclosures of land, 10 a. 1 r. 24 p., f. 160
Four tenements and 0 a. 2 r. 24 p., f. 210

April 19.—By S. B. CLARK & SON.

Cavendish-sq.—147, Harley-st., u.t. 78 yrs., g.r. 16*l.*, p. 5,250

By COCKETT & HENDERSON.

Wanstead.—11, Grove-rd., f., e.r. 85*l.* 1,000
Wanstead-pl., a plot of freehold building land 550

By DEBENHAM, TEWSON, & CO.

Fulham.—North End-rd., f.g.r. 10*l.*, reversion in 27½ yrs. 305
Beddington, Surrey.—Croydon-rd., "Brandries," and 7½ acres, f., p. 4,500
Putney.—197 and 199, Lower Richmond-rd. (s.), u.t. 70½ yrs., g.r. 14*l.*, y.r. 90*l.* 980

By G. F. HARRINGTON.

Plaistow.—85 and 87, Balaam-st., f., y.r. 88*l.* 8s. 780
12, Grange-rd., f., w.r. 27*l.* 6s. 280
East Ham.—91, 93, and 95, York-rd., f., w.r. 110*l.* 10s. 815

By E. H. HENRY.

Clapham.—17, Sandmere-rd., u.t. 76 yrs., g.r. 8*l.* 10s., p. £440
Camberwell.—298, Camberwell New-rd., u.t. 51 yrs., g.r. 7*l.*, y.r. 40*l.* 365

By MARK LIELL & SON.

Mile End.—259 to 267 (odd), Bow Common-la., u.t. 43½ yrs., g.r. 22*l.* 10s., w.r. 156*l.* 1,040
29 and 31, Bridge-st., f., w.r. 59*l.* 16s. 650
Bow.—415, Old Ford-rd. (Ivy Gate Wharf), u.t. 31 yrs., g.r. 32*l.*, e.r. 60*l.* 400
25, Bow-rd., u.t. 13 yrs., g.r. 8*l.*, y.r. 68*l.* .. 375
22, Coborn-rd., u.t. 13 yrs., g.r. 4*l.* 10s., w.r. 42*l.* 18s. 125
44 to 52 (even), Coborn-rd., u.t. 13 yrs., g.r. 15*l.*, y.r. 185*l.* 12s. 600
Limehouse.—22 and 26, Aston-st., u.t. 22½ yrs., g.r. 6*l.* 10s., w.r. 75*l.* 8s. 300
Mile End.—1, Colmer-st., u.t. 22½ yrs., g.r. 3*l.* 3s., w.r. 49*l.* 8s. 210
74 and 76, Grafton-st., u.t. 22½ yrs., g.r. nil, w.r. 72*l.* 16s. 425
West Ham.—30, Meeson-rd., u.t. 75½ yrs., g.r. 5*l.*, w.r. 29*l.* 18s. 180
Commercial-road East.—14, Walter-st., u.t. 10½ yrs., g.r. 2*l.*, w.r. 37*l.* 14s. 125
Forest Gate.—57, Romford-rd., f., y.r. 40*l.* 525
219, Romford-rd., f., e.r. 70*l.* 565
Stratford.—81 to 84, Bridge-rd., u.t. 65½ yrs., g.r. 10*l.*, w.r. 78*l.* 455
38, 40, and 42, Martin-st., u.t. 46½ yrs., g.r. 7*l.*, w.r. 70*l.* 4s. 555
12, Hamfrith-rd., f., y.r. 36*l.* 440

By F. A. & A. W. MELLERSH (at Guildford).

Guildford.—Onslow-st. House, also s., offices, etc., f., p. 1,160
Onslow-st. residence, Blacksmith's s., yard, etc., f., p. 1,560
New-rd., plot of land with buildings thereon, also timber yard, f. (including goodwill).. 2,300
Worplesdon, Surrey.—Ryde's Hill brick yard, 11 acres, f., p. 1,580

By FRED. WARMAN (on the premises).

Gravesend, Kent.—Manor-rd., freehold mineral water manufactory, including, goodwill, machinery, plant, etc. 1,500

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

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MEETINGS.

FRIDAY, APRIL 29.

Royal Institution.—Rev. J. A. Robinson, D.D., Dean of Westminster, on "Westminster Abbey in the Early Part of the XVIIth Century." 9 p.m.

Junior Institution of Engineers.—Visit to the Cassland-road Higher Grade Board School, Wells-street, Hackney, to Inspect the Heating and Ventilating Systems. 6.30 p.m.

Institution of Civil Engineers.—Students' Visit to the Works in progress at the new Thoroughfare between Holborn and the Strand, in course of construction. 11 a.m.

SATURDAY, APRIL 30.

Royal Institution.—Mr. Cyril Davenport, F.S.A., on "Jewellery," III. 3 p.m.

Edinburgh Architectural Association (Associates' Section).—Visit to Roslin.

Institute of Sanitary Engineers, Ltd.—Visit to Guy's Hospital, Borough, S.E.

Builders' Foremen's Association (Memorial Hall, Farringdon-street).—Mr. H. J. Harding on "Aggregates for Concrete and Mortar." 8.30 p.m.

MONDAY, MAY 2.

Royal Institute of British Architects.—Annual General Meeting.

The Sanitary Institute.—Dinner at the Whitehall Rooms, Hôtel Metropole. 7 p.m.

Society of Engineers (Jubilee Meeting).—A paper will be read, entitled "British and American Coal-cutting Machines," by Mr. A. S. E. Ackermann. Previously to the reading of the above paper a short contribution will be read, entitled "A Jubilee Retrospect," being a brief history of the Society since its inception to the present time, by Mr. Perry F. Nursey, past president and secretary. 7.30 p.m.

Society of Arts (Cantor Lectures).—Professor R. Langton Douglas, M.A., on "The Majolica and Glazed Earthenware of Tuscany," II. 4.30 p.m.

TUESDAY, MAY 3.

Royal Institute.—Mr. L. Fletcher, M.A., F.R.S., on "Meteorites," I. 5 p.m.

WEDNESDAY, MAY 4.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.

Society of Arts.—Mr. W. Pollard Digby on "Statistics of the World's Iron and Steel Industries." 8 p.m.

THURSDAY, MAY 5.

Society for the Encouragement of the Fine Arts.—Dr. J. S. Phené, F.S.A., on "Anecdotes and Adventures in the Search for Science and Art." 8 p.m.

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FRIDAY, MAY 6.

Architectural Association.—Mr. A. E. Munby, M.A., F.C.S., on "The Value of Science in an Architectural Curriculum." 7.30 p.m.

Junior Institution of Engineers (Westminster Palace Hotel).—Mr. A. W. Young on "The Design of a Dry Dock." 8 p.m.

Tramways and Light Railways Association (at the Society of Arts).—Discussion on "Running Powers." Introduced by Mr. Thos. W. How. 8 p.m.

Incorporated Association of Municipal and County Engineers.—Visit to Catcleugh Reservoir (Newcastle and Gateshead Waterworks).

SATURDAY, MAY 7.

Edinburgh Architectural Association.—Visit to Dunfermline—the Carnegie Baths and Gymnasium and the Abbey.

Northern Architectural Association.—Visit to New Buildings in Dean-street, Newcastle, and the Laing Gallery.

Incorporated Association of Municipal and County Engineers.—Northern District Meeting; Newcastle-on-Tyne.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" " "
Red Wire Cuts	1 13 0	" at railway depôt.
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality, White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	30 0	per ton, "
Best Ground Blue Lias Lime	21 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8¼	" "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	" "
Ancester in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality*

	s. d.	
Scappled random blocks	2 10	per ft. cube. "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "

STONE.—(*continued*).

HARD YORK—		
Scappled random blocks	3 0	per ft. cube, deld. rly. depôt.
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides (slabs random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
" " " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt
" " " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 "	13 17 6	" "
20 × 10 best seconds "	12 15 0	" "
20 × 12 " " "	13 10 0	" "
16 × 8 " " "	7 0 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 best blue Portmadoc	6 12 6	" "
20 × 10 best Eureka unfading green	15 17 6	" "
20 × 12 " "	18 7 6	" "
18 × 10 " "	13 5 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 12 6	" "
18 × 10 " "	9 12 6	" "
16 × 8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. " "
Best Brosely tiles	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Stafford shire do. (Peakes)	51 9	per 1000 " "
Do. Ornamental do	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced	50 0	per 1000 " "
Do. pressed	47 6	" " "
Do. Ornamental do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	" "
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOINERS' WOOD.

White Sea:	At per standard.	
first yellow deals, 3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6

WOOD.—(*continued*).

JOINERS' WOOD (*contd.*).	At per standard. £ s. d.	£ s. d.
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube	0 4 0	—

Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, £ s. d.	or delivered Railway Vans, £ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders, ordinary sections	8 2 6	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6	8 5 6

METALS.

IRON—	Per ton, in London. £ s. d.	£ s. d.
Common Bars	7 5 0	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0	8 5 0
Staffordshire "Marked Bars"	10 0 0	—
Mild Steel Bars	8 15 0	9 5 0
Hoop Iron, basis price	9 5 0	9 10 0
" " Galvanized	17 10 0	—

(*And upwards, according to size and gauge.)

Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0	—
" " 24 g.	10 15 0	—
" " 26 g.	12 5 0	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	—
Ordinary sizes to 22 g. and 24 g.	13 5 0	—
" " 26 g.	14 5 0	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	16 0 0	—
" " 22 g. and 24 g.	16 10 0	—
" " 26 g.	18 0 0	—
Galvanised Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0	—
" " 22 g. and 24 g.	13 0 0	—
" " 26 g.	13 15 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0	—
" " 26 g.	14 0 0	—
Cut nails, 3 in. to 6 in.	9 0 0	9 10

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lb. and up	15 0 0	—
Pipe in coils	15 10 0	—
Soil pipe	18 0 0	—
Compo pipe	18 0 0	—
ZINC—Sheet— Vieille Montagne ton	26 15 0	—
Silesian	26 10 0	—
COPPER— Strong Sheet per lb.	0 0 10½	—
Thin " "	0 0 11½	—
Copper nails " "	0 0 11	—
BRASS— Strong Sheet	0 0 10	—
Thin " "	0 0 11	—
TIN—English Ingots " "	0 1 4	—
SOLDER—Plumbers' " "	0 0 6½	—
Tinmen's " "	0 0 8	—
Blowpipe " "	0 0 9	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft. delivered.
" fourths	1¾d. " "
21 oz. thirds	3d. " "
" fourths	2¾d. " "
26 oz. thirds	3¾d. " "
" fourths	3d. " "
32 oz. thirds	4¾d. " "
" fourths	4d. " "
Fluted Sheet, 15 oz.	3¾d. " "
" 21 oz.	3¾d. " "
⅛ Hartley's Rolled Plate	1¾d. " "
⅛ " " "	1¾d. " "
¼ " " "	2¾d. " "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 6
" " " in drums	"	0 1 9
Boiled " " in pipes or barrels	"	0 1 9
" " " in drums	"	0 2 0
Turpentine, in barrels	"	0 3 7
" in drums	"	0 3 9
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	"	19 0 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 12 0

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VARNISHES, &c.	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

W. R. (Amounts should have been stated).——Rev. J. C. B. (Below our limit).——"A COMPETITOR" (We cannot attend to letters without name and address enclosed).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

*** Denotes *accepted*. † Denotes *provisionally accepted*.**

BOGNOR (Sussex).—For tar paving Victoria-drive South, for the Urban District Council. Mr. O. A. Bridges, C.E., Surveyor and Engineer, Bognor. Quantities by Surveyor:—

	Per yd. s. d.		Per yd. s. d.
S. Decley & Co.	3 4	La Brea Asphalte Co., Ltd.	2 0
Asphaltic Limestone Concrete Co., Ltd.	2 9	E. Bradshaw & Son	2 0
J. Smart	2 4	A. C. W. Hobman & Co.	2 0
J. Haigh	2 3	F. G. Sheppard & Co.	2 0
P. Smith	2 2	Asphaltes United	1 11
J. Brook	2 0	J. Wainwright & Co., Ltd., 85, Belgrave-road, S.W.*	1 10
North of England Asphalte Co.	2 0		

BRIDGWATER.—For laying out new burial ground, new shelter, boundary walls, etc., for the Westonzoyland Parish Council. Mr. Charles Hiscock, architect, Bridgwater:—

Gleed Bros.	£459 0	Davis & Son	£365 10
Fursland	450 0	Stacey, Westonzoyland*	348 0
Hubbard	378 0		

BRIGHTON.—For alterations to Fire Brigade Station, Duke-street, for the Corporation. Mr. F. J. C. May, Borough Engineer, Town Hall, Brighton:—

Box & Turner	£1,478	R. Cook & Sons	£1,157
J. Longley & Co.	1,349	Rowland Bros.	1,146
F. G. Winter	1,240	J. & W. Simmonds	1,100
W. Olliver	1,200	W. A. Field & Co., Brighton*	1,100
H. J. Penfold	1,197		
Sattin & Evershed	1,194		

BROMYARD.—For new shop and premises at Bromyard, for Mr. John James. Messrs. Groome and Bettington, architects, Palace-chambers. Quantities by the architects:—

W. James	£875	A. Newbold	£870

BROXBOURNE.—For Broxbourne and Wormley Water Supply Works, for Ware Rural District Council. Messrs. Bailey-Denton, Lawford, & Symons, engineers, 9, Bridge-street, Westminster, S.W.:—

Ekins & Co., Ltd., Hertford* £5,300

CREWE.—For alterations and additions to two cottages in West-street, for the Town Council. Mr. G. Eaton-Shore, Borough Surveyor, Crewe. Quantities by Surveyor:—

J. Williams & Son	£140 0 0	J. H. Jervis	£120 0 0
T. Smith & Son	138 0 0	J. R. Goulden	116 0 0
Atkinson	131 2 8	W. Micklewright & Sons*	110 0 0

[All of Crewe.]

CHEPPING WYCOMBE.—For sewer leakage prevention and surface water drainage works, for the Chepping Wycombe Borough Council. Mr. T. J. Rushbrooke, Borough Surveyor, High Wycombe:—

T. Watson, jun.	£19,603 15 9	Horsell	£3,937 0 0
O. G. Osinton	12,100 0 0	Knight & Son	3,925 0 0
T. Free & Sons	9,687 19 0	Renshaw	3,897 0 0
T. & J. Burgoyne	7,761 15 10	Chamberlain	3,885 0 0
W. Lee & Son	7,750 0 0	Whitehead & Co.	3,875 0 0
J. Jackson	7,618 5 3	Watson	3,839 0 0
T. Adams	7,410 0 0	Foster	3,788 0 0
Case Sea Defence Syndicate, High Holborn*	7,322 0 0	Minter, Putney*	3,783 0 0
T. H. McDonald (withdrawn)	6,188 13 0		

CHERTSEY.—For boiler house, chimney shaft, laundry additions and machinery, rain water tank at workhouse, Ottershaw, for the Guardians. Mr. C. Welch, architect, London-street, Chertsey. Quantities by the architect:—

G. Wells	£4,265 0 0	Horsell	£3,937 0 0
G. Gray	4,179 0 0	Knight & Son	3,925 0 0
Drowley & Co.	4,176 0 0	Renshaw	3,897 0 0
R. Neal	4,130 0 0	Chamberlain	3,885 0 0
Page & Son	4,039 0 0	Whitehead & Co.	3,875 0 0
Goddard	4,000 0 0	Watson	3,839 0 0
Dean & Co.	3,993 8 0	Foster	3,788 0 0
Mussellwhite & Sap.	3,986 0 0	Minter, Putney*	3,783 0 0

DUBLIN.—For drainage works at new buildings at lunatic asylum of workhouse, South Dublin, for the Guardians. Mr. W. M. Mitchell, R.H.A., architect, Leinster-street, Dublin:—

P. Dowd & Son	£260	T. Farquharson	£220
G. Dixon	244	J. Kennedy, 11 and 12, Merrion-row*	168
T. Little	242		

DUNDEE.—For iron fencing at Baxter Park and Dudhope Park, for the Town Council. Mr. John Carnochan, Superintendent of Parks:—

E. & J. Raybould & Co., Workington* £225 15 7

EALING.—For erecting three blocks of shops and houses in Northfield-lane, Ealing. Mr. E. A. Tyler, architect, 253, Lavender-hill, Clapham Junction, S.W.:—

Block A.

W. Ray ..... £4,284†

Block B.

Maddicks & Co.	£4,600	J. Cronk†	£4,385

Block C.

Franks Bros.	£3,750	Maddicks & Co.†	£3,225

EAST DEREHAM (Norfolk).—For gasholder, etc., for the Urban District Council. Mr. Henry Kitson, engineer:—

Gasholder Tank.

W. Moss & Sons, Ltd., Foleshill, nr. Coventry* £994 18 0

Gas and Masons Patent Gasholder.

R. Dempster & Sons, Ltd., Elland* 700 0 0

FENTON (Staffordshire).—For the erection of a free library, for the Urban District Council. Mr. F. R. Lawson, architect, Church-street, Fenton. Quantities by architect:—

Ball & Robinson	£5,050	Tompkinson & Bettelley	£4,217
G. Ellis	4,950	Meiklejohn & Sons	4,129
P. H. Bennion	4,691	J. Bagnall, Fenton*	4,102
T. Goodwin	4,374	Young & Son	3,927

FROME.—For sewerage works, for the Urban District Council. Mr. F. W. Jones, Engineer and Surveyor to the Council. Quantities by Engineer:—

T. Free & Co.	£2,199 7 8
Ernest Irelane	2,148 8 6
J. Hodder & Sons	2,045 0 0
J. Riley, Cheltenham*	1,952 18 0

GILLINGHAM, KENT.—For the erection of thirty cottages in St. George's-road. Mr. E. J. Hammond, C.E., architect, 21, Balmoral-road, Gillingham, Kent:—

W. G. Hogg	£7,500 0	A. S. Engleton	£6,000 0
J. A. Davison	6,750 0	G. J. Bragg	5,512 0
G. James	6,690 0	White & Co.	5,490 0
W. W. Hammond	6,375 0	H. F. Capsoll	5,370 0
H. J. Galer	6,172 10	J. Wilford, Snodland*	5,370 0
A. G. Candler	6,060 0	O. Hollett	4,800 0

GRAYS (Essex).—For making-up and kerbing roadway and laying sewers at Grays, for the Kent and Essex House, Land, and General Investment Co. Mr. G. W. Cobham, surveyor, 1, Edwin-street, Gravesend:—

T. Adams	£852 0 0	J. Jackson	£680 0 0
E. Lamble	785 0 0	G. Harber, 18, Rutland-rd., East Ham, E.*	663 10 3
G. B. Rons	779 0 0		
T. W. Marsh	755 0 0		
Parsons & Parsons	750 0 0		

GREAT YARMOUTH.—For erecting furniture showrooms, 45, Middlegate-street, for Mr. Woolsey. Mr. J. E. Teasdel, architect, 3, Queen-street, Great Yarmouth. Quantities by architect:—

G.W. Beech	£1,304 0 0	J. E. Pestell	£1,233 0 0
F. Grimble	1,249 10 0	Moore & Son	1,190 0 0

Bricklayers.

G. W. Beech	£559 0 0	J. M. Dawson	£538 19 0
J. Leggett	557 0 0	J. E. Pestell	520 0 0

Carpenter.

J. G. Cooper	£730 16 0	O. Wright	£620 0 0
W. Balls	631 0 0		

Lowest single, including plumber .. £1,249 0 0

Plumbers.

J. Pitcham	£123 0 0	G. W. Goode	£119 18 0
J. Ankerton	120 0 0	Platt & Son	109 0 0
Bricklayer	£520 0 0	Plumber	£109 0 0
Carpenter	620 0 0		
			£1,249 0 0

HEREFORD.—For erecting a residence at The Barton, for Mr. H. Evans. Messrs. Groome and Bettington, architects, Palace-chambers, Hereford. Quantities by architects:—

R. L. Friend	£860 0 0	W. Bowers & Co.	£748 5 0
R. Taylor	790 0 0	W. Powell	746 8 6
T. Hiles	772 0 0	C. Cooke	712 0 0

[All of Hereford.]

HIPPERHOLME (Yorks.).—For laying about 3,746 yards of water mains, etc., for the Urban District Council. Mr. G. W. Thompson, Surveyor, Council Offices, Hipperholme:—

F. G. Applegate	£3,018 10 2	R. Bowers	£709 4 0
J. T. Short	1,703 5 4	Bower Bros.	695 0 0
W. Jowett	1,123 0 0	H. & W. Barraclough	688 6 2
T. C. Starkey	1,057 19 5	S. Bedford & Son	654 6 0
Riley Bros. & Hartley	780 7 10	Wilson Stocks	548 10 0
W. Barrick	774 19 0	M. Hall	513 19 7
Hill & White	742 0 0	H. E. Buckley, Bingley*	419 19 2
W. Ward	710 10 0	S. Hall	417 14 8

HONLEY.—For the erection of a villa residence and out-offices at Farbank, Honley, near Huddersfield. Messrs. Lunn & Kaye, architects, Milnsbridge. Quantities by architects:—

Mason: A. Graham & Sons, Huddersfield	£472 0 9
Joiner: E. Holroyd & Sons, Honley	250 0 0
Plumber: T. France, Honley	109 19 0
Tiler: A. Bower, Crosland Moor	56 0 0
Plasterer: G. H. Day, Milnsbridge	58 0 0
Painter: Spence & Co., Honley	11 13 0
Concreter: J. E. Dyson, Lindley	28 16 0
Electrician: T. A. Armitage, Huddersfield	37 17 6

HORFIELD.—For construction of road and sewer. Mr. W. P. Saunders, architect and surveyor, Rupert-chambers, Quay-street, Bristol. Quantities by the Surveyor:—

W. Galbraith	£1,182 17 9	W. & J. Bennett	£563 0 0
M. Lovell	1,008 0 0	J. Dare	565 0 0
E. Monks	853 19 2	Wilkins & Gosling*	564 0 0
Thatcher Bros.	669 16 2	M. Parker	548 0 0
E. A. Jenkins	658 10 0		
Mereweather & Sons	582 0 0		

[All of Bristol.]

LEOMINSTER.—For erecting a pair of semi-detached villas at Leominster, for Mr. A. Gardner. Messrs. Groome and Bettington, architects, Palace-chambers, Hereford:—

C. Cooke	£1,365 0 0	W. Powell, Hereford†	£1,291 15 0
J. Watkins	1,325 5 0		
J. H. Davies	1,297 10 0		

LONDON.—For repair to river wall and end wall to the salt shed at Belgrave Wharf, for the Westminster City Council:—

J. W. Hobson	£158 0	Kirk & Randall	£136 0
Bull & Esdaile	155 0	T. W. Haylock	133 0
W. Wright & Son	150 0	Love & Co.	114 15
H. & E. Lea	143 10	J. R. Sims*	99 10

LONDON.—For the supply of plant for the electrical working of the Southwark, etc., tramways, for the London County Council:—

	Weeks.
British Westinghouse Electric and Manufacturing Co., Ltd. £5,492	12
Dick, Kerr, & Co., Ltd., London* 5,150	12
British Thomson-Houston Co., Ltd. 4,837	20

LONDON SCHOOL BOARD TENDERS.

Magdalen-street Temporary School, Horselydown.

On the 24th March, the Committee submitted to the Board a list of the tenders which had been received for the erection of a junior mixed and infants' school of one story on the site in Magdalen-street, Horselydown, to provide accommodation for 372 children; and the Board then agreed to accept the lowest tender, that of Messrs. Edwards & Medway, amounting to 7,400*l.* A letter, however, has since been received from the Contractors, stating that their price should have been 8,200*l.*, but that they would be willing to allow a reduction of 200*l.*, making the amount of their tender stand at 8,000*l.* The Committee recommend the acceptance of the second lowest tender, that of Messrs. Spencer, Santo & Co., Ltd., amounting to 7,947*l.*, subject to the approval of the new authority.

Timbercroft-road Site, Plumstead, for New School.

Halls: Senior mixed school, 57 ft. 7½ in. by 26 ft. 6 in.; junior mixed school, 57 ft. by 25 ft.; infants' school, 54 ft. by 26 ft. 6 in. Classrooms: Senior mixed school, 48, 48, 48, 48, 40, 40, 40, 30. Junior mixed school, 56, 50, 48, 48, 48, 48. Infants' school, 50, 50, 48, 48, 48, 48, 48. Planned for future extension—Senior mixed: one classroom, 40; junior mixed: one classroom, 56; infants, one classroom, 50. Heating by low-pressure hot-water apparatus and open fires. Area of site, 66,700 sq. ft. Playgrounds, area per child: Boys', 57 sq. ft.; girls, and infants', 31 sq. ft. Playgrounds calculated for the completed school:—

J. Garrett & Son	£22,100	F. & H. F. Higgs	£20,751
J. Greenwood, Ltd.	21,850	Thomas & Edge	20,455
Martin, Wells, & Co., Ltd.	21,450	J. Smith & Sons, Ltd.	20,315
Patman & Fotheringham, Ltd.	21,025	J. & C. Bowyer	20,266
E. Lawrance & Sons	20,842	Treasure & Son	20,150
		W. Downs	19,999
		G. E. Wallis & Sons, Ltd.*	19,356

Elizabeth-street School, North Woolwich, for Enlargement.

W. Akers & Co.	£4,183 0	[Unsigned]	£3,693 0
J. Smith & Sons, Ltd.	4,128 0	T. D. Leng	3,659 0
Martin, Wells, & Co., Ltd.	3,883 0	W. Harris	3,621 16
J. Garrett & Son	3,876 0	J. & C. Bowyer	3,597 0
Rice & Son	3,834 0	Treasure & Son	3,446 0
G. E. Wallis & Sons, Ltd.	3,798 0	Enness Bros.	3,319 0
Lathey Bros.	3,701 0	Edwards & Medway	3,318 0
Thomas & Edge	3,697 0	E. P. Bulled & Co.*	3,299 0

Sigdon-road School, Dalston-lane, for Enlargement.

A. Porter	£2,028 0 0	Staines & Son	£1,890 0 0
W. Gregar & Son	2,024 0 0	Treasure & Son	1,656 0 0
Perry & Co.	2,012 0 0	C. Dearing & Son	1,808 10 0
Marchant & Hirst	2,000 0 0	J. Willmott & Sons	1,771 0 0
W. Shurmur & Sons, Ltd.	1,971 0 0	G. Neal	1,727 0 0
McCormick & Sons	1,914 0 0	J. Chessum & Sons*	1,686 15 9

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LONDON SCHOOL BOARD—*Continued.*

Dunt's Hill Site, Wandsworth New School.

Senior mixed school, 376; junior mixed school, 376; infants' school, 388; total, 1,140. Senior mixed school—Hall 60 ft. by 25 ft. 6 in. Classrooms, 56, 50, 45, 45, 45, 45, 45. Drawing classroom and science room, area 600 sq. ft. each. Junior mixed school—Hall, 60 ft. by 25 ft. 6 in. Classrooms, 56, 50, 45, 45, 45, 45, 45. (Senior mixed and junior mixed school—two-story building). Infants' school on one story—Hall, 54 ft. by 26 ft. 6 in. Classrooms, 50, 50, 48, 48, 48, 48, 48, 48. Heating by low-pressure hot-water apparatus and open fires. Schoolkeeper's house. Area of site, 70,525 sq. ft. Playgrounds, area per child, senior and junior boys, 51 sq. ft.; senior and junior girls and infants, 38 sq. ft. :—

J. Garrett & Son	£24,910	W. King & Son ..	£23,947
Leslie & Co., Ltd.	24,575	Lathey Bros.	23,849
E. Lawrance & Sons	24,509	Martin, Wells, & Co., Ltd.	23,819
J. Carmichael	24,171	J. & M. Patrick ..	23,654
J. Simpson & Son	24,090	W. Johnson & Co., Ltd.	23,499
F. & H. F. Higgs	23,995	Stimpson & Co. ..	23,450
J. & C. Bowyer ..	23,987	Holliday & Greenwood, Ltd.* ..	23,337
Holloway Bros., Ltd.	23,957		

Rosendale-road Site, West Dulwich, for School for Sixty Mentally Defective Children.

J. Marsland & Sons	£4,167	F. & H. F. Higgs..	£3,581
W. Akers & Co. ..	3,845	Rice & Son	3,533
Enness Bros. ..	3,741	W. J. Mitchell & Son	3,525
Martin, Wells & Co., Ltd.	3,721	J. Garrett & Son ..	3,499
F. G. Minter.. ..	3,678	T. D. Leng	3,469
J. Smith & Sons, Ltd.	3,668	Holliday & Greenwood, Ltd.	3,423
E. P. Bulled & Co.	3,629	E. Triggs	3,356
W. Smith & Son ..	3,610	Edwards & Medway	3,300
		J. & C. Bowyer* ..	3,297

Ambler-road Site, Finsbury-park, for School for Sixty Mentally Defective Children.

C. Dearing & Son..	£3,632	Marchant & Hirst..	£3,282
G. S. S. Williams & Son	3,486	W. M. Dabbs & Son	3,252
J. Grover & Son ..	3,450	G. Neal	3,225
A. Porter	3,423	E. Lawrence & Sons	3,213
L. H. & R. Roberts	3,388	Stevens Bros. ..	3,178
McCormick & Sons	3,285	Treasure & Son ..	3,108
		J. Wilmott & Sons*	3,095

Middle-row Site, Kensal New Town, Manual Training Centre.

The Board on the 24th March authorised the Committee to place in the hands of Mr. E Triggs, the contractor who is now completing the erection of the junior mixed department on the Middle-row site Kensal New Town, the work of providing a Manual Training Centre on the site for forty boys (such centre to take the place of the existing centre at Wornington-road); upon the understanding that the cost of the work, which is estimated at £947, shall be calculated as a variation on his contract for the junior mixed school. A letter has since been received from Mr. Triggs, stating that the position intended for the proposed new building will considerably add to the cost of erecting it, and offering to carry out the work providing an addition of 7½ per cent. be made to his contract schedule of prices, plus 1½ per cent. for measuring up and a proportionate amount on the preliminary items. The Committee are advised that this offer is fair and reasonable, and they recommend the Board to accept it.

Ensham-street, Mitcham-road, Lower Tooting, Enlargement of Manual Training Centre.

The Board, on the 24th March, authorised the Committee to place in the hands of the contractors for the new school recently erected on the Ensham-street site, Lower Tooting, the work of enlarging the Manual Training Centre, so as to accommodate forty boys instead of twenty, upon the understanding that the cost of the work, which is estimated at £475, shall be calculated as a variation on their contract for the new school. The Committee have now received a letter from the contractors—Messrs. W. H. Lorden & Son—stating that they have inspected the site of the proposed extension of the manual training centre, but that as there are no means of getting materials on to the site except by drawing them across the tarpaving, they are unable to carry out the work at their Schedule of prices for the new school; and suggesting that a reasonable amount to be added to their schedule would be 10 per cent. The Committee are advised that this proposal is a fair and reasonable one, and they accordingly recommend that it should be adopted.

Sussex-road Site, Brixton—Third Classroom for Special School.

The Board, on the 3rd March, agreed to give instructions to Messrs. W. J. Mitchell & Son, the Contractors for the new school for mentally defective children, recently erected on the Sussex-road site, Brixton, to provide a third classroom for twenty children, upon the understanding that the cost of the work, which is estimated at £360, should be calculated as a variation on their contract for the special school. The Committee have since received a letter from the Contractors, stating that they cannot undertake the provision of the third classroom for the special school on their Contract Schedule of prices, as the schedule was a very low one; and offering to do the work for an additional 10 per cent., plus measuring fees. The Committee are advised that this request is a reasonable one, and they recommend the Board to accept the offer of the Contractors.

Plassy-road School, Catford—Fourth Classroom for Special School.

The Board are erecting a school for mentally defective children, consisting of three rooms for twenty children each, on the site in Plassy-road, Catford, and the building has been planned for enlargement by an additional classroom to accommodate twenty children. The School Management Committee have recommended that the fourth classroom should be provided at once, instead of being left over for subsequent provision. The Works Committee now recommend that the additional classroom should be provided by the Contractors who are engaged in erecting the special school, as a variation on their contract for the work now in progress.

St. John's Hill Site, Wandsworth, erection of Iron Building for use of Visitors.

Robert Iles, Ltd. ..	£849	W. Harbrow	£515
T. Cruwys.....	739	Humphreys, Ltd. ..	489
T. J. Hawkins & Co.	586	F. Smith & Co.	430
J. McManns	550	A. Leather*	415

Highbury Truant School—the provision of a Swimming Bath and for Carrying out other Works.

T. L. Green	£3,693	W. Downs.....	£3,490
W. Shurmur & Sons, Ltd.	3,663	J. Willmott & Sons	3,450
J. Grover & Son ..	3,626	McCormick & Sons	3,408
G. S. S. Williams & Son	3,566	E. Lawrance & Sons	3,258
Stevens Bros.	3,524	C. Dearing & Son*	3,253

For Adaptation of "Oak Lodge," Nightingale-lane, Wandsworth Common, for the Purpose of Establishing a Residential Home for Elder Deaf Girls :—

R. A. Jewell	£5,463	W. Downs	£4,879
E. Lawrance & Sons	5,155	J. Appleby & Sons	4,820
F. & H. F. Higgs..	5,029	Treasure & Son ..	4,803
E. P. Bulled & Co.	4,997	W. Johnson & Co., Ltd.	4,780
J. Garrett & Son ..	4,979	F. G. Minter	4,700
J. Carmichael	4,948	E. Triggs*	4,700
J. & C. Bowyer ..	4,947		
Lathey Bros.	4,923		

For Adaptation of Houses, Nos. 48 and 50, Acre-lane, Brixton, for the Purpose of Establishing Home for Mentally Defective Girls :—

Rice & Son	£3,769	W. J. Mitchell	£3,547
E. B. Tucker	3,756	H. Groves	3,533
W. Akers & Co. ..	3,637	E. Triggs	3,475
J. Garrett & Son ..	3,624	J. Appleby & Sons	3,415
E. P. Bulled & Co.	3,593	Holliday & Greenwood, Ltd.	3,383
J. & C. Bowyer....	3,587	Edwards & Medway*	3,160
F. & H. F. Higgs..	3,563		

Cator-street School, Peckham, for Sanitary and Drainage Works.

J. W. Falkner & Sons	£3,532	W. Hammond	£3,352
W. Downs.....	3,508	J. & C. Bowyer ..	3,279
W. J. Mitchell & Son	3,485	H. Leney & Son ..	3,263
G. Parker	3,439	Lathey Bros.	3,207
		J. Peattie*	3,198

Scawfell-street School, Hackney-road, for Sanitary and Drainage Works.

E. Lawrance & Sons	£3,076	J. Peattie	£2,682
G. S. S. Williams & Son	2,947	Stevens Bros.	2,668
G. Neal	2,806	F. Bull	2,614
L. H. & R. Roberts	2,788	J. Willmott & Sons*	2,585

Gideon-road School, Battersea, for Reconstructing Offices.

E. Triggs	£2,423	J. & C. Bowyer ..	£1,657
W. Downs.....	1,900	H. Leney & Son ..	1,654
G. Parker	1,821	R. P. Beattie	1,568
E. B. Tucker	1,763	Davis & Bennett..	1,560
Maxwell Bros., Ltd.	1,716	Whitehead & Co., Ltd.*	1,498
Lathey Bros.	1,669		

Credon-road School, Rotherhithe New-road, for Sanitary and Drainage Works.

J. Carmichael	£1,640	0 0	G. Parker ..	1,480	0 0
H. Leney & Son	1,634	0 0	F. Bull	1,479	0 0
W. J. Mitchell & Son	1,598	0 0	J. W. Falkner & Sons	1,436	0 0
J. & C. Bowyer	1,587	0 0	R. P. Beattie	1,431	14 9
Lathey Bros.	1,547	0 0	Davis & Bennett	1,430	0 0
W. Downs ..	1,512	0 0	A. Porter* ..	1,393	0 0

Brownhill-road Site, Catford—(a) *Higher Grade School of Three Stories, and*—(b) *Junior Mixed and Infants' School of Two Stories, for Heating Apparatus.*

Stevens & Sons ..	£1,600	Brightside Foundry & Engineeering Co., Ltd.	£1,297
W. G. Cannon & Sons	1,495	B. Harlow & Son	1,297
J. & F. May	1,400	Wippell Bros. & Row	1,295
Paragon Heating Co.	1,372	J. Wontner-Smith Gray, & Co.	1,246
Z. D. Berry & Sons	1,335	J. Fraser & Son* ..	1,183
C. Kite & Co.	1,300		

Myrdle-street Site, Stepney—(a) *Graded School of Three Stories, and* (b) *Higher Grade School of Three Stories—for Heating Apparatus.*

Stevens & Sons	£1,100	0 0	R. H. & J. Pearson, Ltd.	£953	0 0
J. Grundy ..	1,095	0 0	J. Williams & Sons, Ltd.	945	0 0
A. H. Skinner & Co.	1,085	0 0	J. Fraser & Son	899	0 0
J. & F. May	1,077	0 0	Paragon Heating Co. ..	896	0 0
Davis & Bennett	1,073	0 0	J. Wontner-Smith, Gray & Co.*	879	0 0
J. Richmond & Co., Ltd.	1,055	18 0			
Wippell Bros. & Row....	1,050	0 0			

Flora-gardens School, Hammersmith, for Re-constructing Offices, etc.

J. Carmichael ..	£2,000	0	R. P. Beattie .. £1,755 10
Martin, Wells, & Co., Ltd.	1,850	0	J. Peattie 1,736 0
G. Neal	1,837	0	Lathey Bros. .. 1,709 0
C. W. Killingback & Co. ..	1,790	0	F. Bull..... 1,658 0
W. Hammond..	1,779	0	Davis & Bennett* 1,598 0

Denmark Hill New School, Camberwell, for Heating Apparatus.

W. G. Cannon & Sons.....	£962	0	Purcell & Nobbs . £796 0
Wright Bros.	940	0	Z. D. Berry & Sons 785 0
J. & F. May	920	0	Paragon Heating Co. 772 10
J. Yetton & Co...	850	0	Brightside Foundry & Engineering Co., Ltd. .. 757 0
R. H. & J. Pearson, Ltd.....	840	0	Lancashire Heating Co.* 670 0
Werner, Pfleiderer, & Perkins, Ltd.	836	0	

Blakesley-street New School, Stepney, for Heating Apparatus.

Wright Bros.	£984	0	J. Wontner-Smith, Gray, & Co. £686 0
Stevens & Sons ..	850	0	J. Richmond & Co., Ltd..... 681 18
J. Esson & Son ..	769	0	Paragon Heating Co. 654 0
Wippell Bros., & Row	750	0	J. Yetton & Co.* 650 0
Comyn Ching & Co., Ltd.....	690	0	

Duncombe-road Senior Mixed School, Upper Holloway, for Heating Apparatus.

Wippell Bros., & Row.....	£450	0	Palowkar & Sons £389 0
R. Clarke	426	0	Paragon Heating Co. 378 0
J. Yetton & Co. .	420	0	B. Harlow & Son 372 0
Davis & Bennett.	405	0	G. & E. Bradley* 363 10

Essendine-road School, Maida-hill, for Heating Apparatus for Enlargement.

J. Williams & Sons, Ltd.	£131	0	Palowkar & Sons. . £88 0
C. Kite & Co.	110	0	J. & F. May..... 78 0
Wippell Bros., & Row	110	0	G. Davis 76 0
W. Simmons	103	5	Lancashire Heating Co. 76 0
Purcell & Nobbs ..	98	0	J. Wontner-Smith, Gray, & Co.* .. 75 0
Brightside Foundry & Engineering Co., Ltd.	94	0	

Haselrigge-road School, Clapham, for Adapting House for Housewifery and Fitting-up Rooms for Schoolkeeper.

Rice & Son	£599		E. B. Tucker £433
J. Garrett & Son....	588		Maxwell Bros., Ltd.. 430
J. C. Chalkley	472		R. A. Jewell 425
E. Triggs	460		R. S. Ronald 420
W. Hammond	447		H. Leney & Son* .. 398

St. John's, Halley-street, Limehouse, for Adaptation of House on Site for (a) *Housewifery Centre, and* (b) *Use of Schoolkeeper.*

Woollaston Bros.	£362	0	Geo. Barker .. £260 0
Vigor & Co. ..	297	10	A. E. Symes .. 252 0
J. T. Robey ..	290	0	A. J. Sheffield .. 236 0
J. Dolman & Co.	285	0	A. Heard & Co.* 218 0

Running Contracts for the Supply of Various Articles of Furniture.

(*a*) Mr. H. Bouneau for the supply of (i.) inkwell cupboards, at £3 15s. each; (ii.) science demonstration tables, at £2 2s. each; and (iii.) tables, 6 ft. by 3 ft. 6 in., at £3 3s. each.

(*b*) Mr. H. Burman, for the supply of honour boards for graded schools at £1 each.

(*c*) Mr. A. Duncan, for the supply of rack cupboards at £5 8s. 6d. each.

(*d*) Messrs. Galbraith Bros., for the supply of (i.) No. 14 cupboards (gymnastic apparatus), at £4 9s. 6d. each; (ii.) hat and coat stands, at £1 14s. each.

(*e*) Messrs. R. Goodman & Sons, for the supply of (i.) attendance boards, at 15s. each; (ii.) time-table frames, No. 1, at £2 4s. per doz.; and No. 2, at £1 12s. per doz.

(*f*) Messrs. G. M. Hammer & Co. (Ltd.), for the supply of (i.) tray cupboards, at £6 17s. each; (ii.) easels, No 2, at 8s. 4d. each; and No. 3, at 9s. 4d. each.

(*g*) The London School Furniture Co., for the supply of (i.) single locker oak desks, with locks, at 18s. each; (ii.) ditto without locks at 17s. each; and (iii.) yokes (for carrying coal), at 6s. 6d. each.

(*h*) The North of England School Furnishing Co., Ltd., for the supply of Honour boards for Pupil Teachers' Schools, at £1 9s. 3d. each.

(*i*) The Parkstone Steam Joinery Co., for the supply of cutting-out tables, at £3 3s. each.

(*j*) Messrs. Wrinch & Sons, for the supply of (i.) trolleys, 4 ft. 6 in. by 2 ft. 5 in., at £4 17s. 6d. each; (ii.) ditto, 4 ft. by 2 ft., at £4 15s. each; (iii.) ditto, 5 ft. by 2 ft. 5 in., at £5 each.

Running Contract for the supply of Drawing Models.

—	Cubes.	Hexagonal prisms.	Cones.	Cylinders.	Square pyramids.	Oblongs.	Hoops.	Triangular prisms.	Set of eight.	Six sets of eight pieces to each set.	Advanced spheres.	Advanced skeleton cubes.	[Advanced solid cubes.
	each	each	each	each	each	each	each	each	complete	complete	each	each	each
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£ s. d.	£ s. d.	s. d.	s. d.	s. d.
G. Cussons	4 0	4 6	4 6	4 6	4 6	3 6	3 6	3 0	1 12 0	9 12 0	5 9	5 6	12 9
H. Bouneau.....	5 4	6 10	7 10	7 10	5 4	5 4	5 0	5 4	2 8 10	13 18 0	9 6	8 0	12 6
T. Cruwys	8 0	9 6	10 6	10 6	8 0	8 0	7 0	8 0	3 10 0	—	12 0	10 0	8 0
G. M. Hammer & Co., Ltd.	5 0	6 0	7 0	7 0	5 0	4 6	5 0	5 0	2 2 6	12 12 0	7 6	7 6	1 6
London School Furniture Co.*	3 0	3 6	4 0	3 0	3 6	3 0	2 0	3 0	1 5 0	7 10 0	5 6	4 0	2 0
North of England School Furnishing Co., Ltd.....	3 2	5 10	6 6	6 3	7 0	5 10	2 2	6 3	2 5 0	2 4 4 [12 4 4]	7 6	5 4	1 2
Previous prices	4 0	4 6	5 0	4 0	4 6	4 0	2 0	4 0	1 12 0	9 12 0	—	—	—

TENDERS—*Continued on page 481.*

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COMPETITIONS, CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums	Designs to be Delivered
Reading Rooms, Beoley and Bartley Green.....	King's Norton & Northfield U.D.C.	Not stated (to Architects in District)	June 6

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Welsh Chapel, 86, High Park-street, Liverpool	.....	T. T. Rees, Architect, May-buildings, Liverpool.....	April 29
Eleven Houses, Dyffryn-road, Maesteg	.....	T. Margam, Llynvi House, Dyffryn-road, Maesteg	May 2
Constructional Ironwork, Electricity Works, Valley-rd.	Bradford Corporation	Electricity Offices, Whitaker-buildings, Bradford	do.
Three Cornish Boilers to New District Baths	do.	F. E. P. Edwards, City Arh., Whitaker-bdgs., Brewery-st., Bradford	do.
Cottage, Woodside, Mossotwie	.....	J. Wittet, Architect, Elgin	do.
Addition to Aberlour School	.....	do.	do.
A 350-kw. Steam Generator.....	Cleckheaton U.D.C.	A. Pickersgill, Electrical Engineer, Electricity Works, Cleckheaton	do.
Roadmaking and Drainage at Hospital.....	Norman Hospital Committee.....	W. Hamilton, Architect, Fearnley, Station-lane, Featherstone ..	do.
6,700 ft. of Creosoted Timber, Masham.....	Leeds Waterworks	City Engineer's Office, Municipal-buildings, Leeds.....	do.
Additions, etc., to Business Premises, Argoed	.....	N. T. Price, Architect, Argoed, Mon.	do.
Materials	Greenock Corporation	W. Ewing, Engineer and Manager, Inchgreen Gasworks.....	do.
Gas Oil, Iron Roofs, and Iron Coke Hoppers	Dundee Gas Commissioners	A. Yuill, Engineer and Manager, Gasworks, Dundee.....	do.
120 Tons of Purifying Lime.....	North Berwick Town Council	A. D. Wallace, Town Clerk, North Berwick	do.
Repair of Roads.....	Ballymoney R.D.C.	T. B. Hamilton, Clerk, Rural District Council Office, Ballymoney	May 3
Three Bridges, Stranocum, Crookan, & Ballybradden	do.	do.	do.
1,500 yds. of 6-in. and 900 yds. of 4-in. Pipes.....	Wilmslow & Alderley Edge Gas Co.	W. Severs, Engineer and Manager, Gasworks, Wilmslow	do.
Convenience in Old Deer Park Recreation Ground..	Richmond Corporation	Borough Surveyor, Town Hall, Richmond	do.
Add'ns, etc., Premises, Baldwin-la., Westg'te, Bradford	.....	J. Ledingham, F.R.I.B.A., District Bank-chambers, Bradford ..	do.
Reb'd'g Photo'er's Premises, Barkerend-road, Br'df'd	.....	T. Leadley, Architect, 3, Coleridge-place, Bradford	do.
Materials and Team Labour	Dorking R.D.C.	W. W. Hopking, Great Bircham	do.
Wesleyan Chapel, Marham	Trustees	Rev. H. Hartley, Stoke Ferry	do
Painting Warren Farm Schools	Brighton Guardians.....	H. S. Reed, Surveyor, Parochial Offices, Prince's-street, Brighton	do.
Road Materials	Hetton U.D.C.	J. Harding, Surveyor to Council, Hetton-le-Hole, R.S.O.....	do.
Materials	Great Crosby U.D.C.	Watkin Hall, Surveyor, Council Offices, College-road, Gt. Crosby	do.
Road Works, Cook's-lane (Contract 1)	do.	do.	do.
do. Alexandra-road (Contract 2)	do.	do.	do.
do. Shaftesbury-road (Contract 3)	do.	do.	do.
do. College-avenue (Contract 4).....	do.	do.	do.
do. Bonds-lane (Contract 5)	do.	do.	do.
Coal Shed, Sanitary Accommodation, etc.	Cardiff Guardians.....	E. Seward, F.R.I.B.A., Queen's-chambers, Cardiff.....	do.
Materials, Parks Department	Glasgow Corporation	J. Whitton, 249, George-street, Glasgow	do.
Alterations to Chevin Hall, Otley	N.W. Co-operative Homes Assoc..	J. B. Thornley, Architect, Darwen, Lancs.	do.
Painting, etc., Hove Sanatorium, Haughton	Hove Corporation.....	H. H. Scott, Borough Surveyor, Town Hall, Hove	do.
Residence, Cliff-road, Wilmslow	.....	F. C. Lock, 118, Deansgate, Manchester	do.
Additions to Aberdare Hall, Cardiff	.....	Wills & Anderson, Architects, 4, Adam-street, Adelphi, London	May 4
Paving and Flagging Streets	Leeds Corporation	City Engineer's Office, Municipal Buildings, Leeds	do.
Restoration of Chancel, Wensley Church, nr. Leyburn	.....	W. Morton, Surveyor, 27, John-street, Sunderland	do.
5,000 Tons of Limestone, etc.	Llantrisant, etc., R.D.C.....	G. S. Morgan, Surveyor, School-street, Pontyclun	do.
Thirteen Houses at Treharris	The No. 2 Oakland Building Soc.	Osborne & Rees, Architects and Surveyors, Nelson, Glam.	do
Kerbing, Tar Paving and Pitching, Shoreham.....	Sevenoaks R.D.C.	R. Bailey, Surveyor, Sundridge	do.
Stable, etc., Well Farm, Port Bridge, Stoke Gabriel.	Colonel R. W. Studdy.....	W. F. Tollitt, Architect, 10, High-street, Totnes	do.
200 Yards Wrought-Iron Vertical Bar Railing, etc..	Mexborough U.D.C.	G. F. Carter, C.E., Surveyor to the Council	do.
Paving Works.....	Westminster City Council	Works Depart., Westminster City Hall, Charing Cross-rd., S.W.	May 5
Excavation Work for Water Mains	Dublin Waterworks Committee....	Spencer Harty, City Engineer, City Hall, Dublin	do.
Pump for Lifting 6,000 Gallons of Sewage per Hour	Stansted Parish Council	E. T. Watts, Surveyor, Thorley, Bishop's Stortford	do.
Eight houses at Cwmgwrach, Glyn-Neath.....	Glyn-Neath Building Company....	G. A. Treharne, Engineer and Architect, 18, Canon-st., Aberdare.	do.
Store and House, Marsh-street, Manchester-road ..	Bradford Co-operative Society	W. Rycroft, Architect, Bank-buildings, Manchester-rd., Bradford	do.
2,000 Tons of Broken Granite.....	Melford R.D.C.....	W. Carver, Surveyor, 3, Melford-road, Sudbury, Suffolk	do.
*Eighty-seven Houses, Spring-lane, Woodside	Croydon Borough Council	G. F. Carter, Borough Engineer, Town Hall, Croydon	May 6
Additions to Hall & Institute, Cwmaman, Aberdare.	.....	T. Roderick, Architect, Clifton-street, Aberdare.....	do.
Reseating, Painting, etc., Bethania Chapel	Cwmavon Building Committee	J. Cook Rees, Architect, Neath	do.
Cleaning & Painting Bldgs., New Worthy Rec. Gnd.	Leeds Corporation	City Engineer's Office, Municipal Buildings, Leeds	do.
Materials	Felixstowe and Walton U.D.C.	H. Clegg, Surveyor to Council, Town Hall, Felixstowe.....	do.
Steading of Offices on Farm of Berwick, Fintray ..	.....	A. Stronach, jun., & Son, 20, Belmont-street, Aberdeen	do.
Dwelling House, Fintray	.....	do.	do.
Cables	Poplar Borough Council	P. N. Hooper, Boro' Eng., Elec. Wks., Glaucus-st., Bromley-'-Bow	May
Battery	do.	do.	do.
Road Materials and Rolling.....	Aghalee R.D.C.....	County Surveyor, County Court House, Belfast.....	do.
Plymouth-grove Municipal Schools, Chorlton	Manchester Education Committee..	Education Office, Deansgate, Manchester	do.
Granite Paving Materials	Bootle Corporation	Borough Engineer's Office, Town Hall, Bootle	do.
Materials, Rothbury	Tynemouth Corporation	H. Clarke, Town Hall, Tynemouth	do.
Piggeries, Bristol	Asylum Visiting Committee	P. Addie, City Valuer, Council House, Bristol.....	do.
Sewage Farm Pumping Engines	Darlington Corporation	G. Winter, Borough Surveyor, Darlington	do.
School Buildings & Offices, Staplegrove-rd., Taunton	Govs. of Bishop Fox's Girl's School	Samson & Cottam, Architects, 1, Hammet-street, Taunton.....	do.
Street Making, Lewis-street	Crewe Town Council	G. Eaton Shore, Borough Surveyor, Heath-street, Crewe.....	May 9
Making-up Harrop-road	Hale U.D.C.	T. Blagburn, Surveyor, Council Offices, Ashley-rd., Hale, Cheshire	do.
Switch Boards and Instruments	Glasgow Corporation	W. A. Chamen, Engineer, 75, Waterloo-street, Glasgow	do.
Cast-Iron Joint Boxes	do.	do.	do.
Additions to Westwood Branch Store	.....	Manager of Blaydon Co-operative Society, Westwood	do.
Additions, etc., Tillicoultry School.....	The School Board	J. Melvin & Son, Architects, Alloa	do.
Contract No. 19—Baths and Washhouses.....	Bermondsey Borough Council	Town Hall, Spa-road, Bermondsey	do.
Double Acting Penstock Doors for new Dock	Belfast Harbour Commissioners....	G. F. L. Giles, Harbour Engineer, Belfast	do.
Isolation Hospital on School Grounds	Com. of Newtown School, Waterf'd	J. F. M'Mullen, Architect, 30, South Mall, Cork.....	do.
Road Material.....	Romford R.D.C.	G. Lapwood, Highway Surveyor, Victoria-chambers, Romford ..	do.
Widening Loxford Bridge, Ilford-lane	Ilford U.D.C.	H. Shaw, Surveyor to Council, Town Hall, Ilford	do.
*Carnegie Free Library	Southall-Norwood U.D.C.	Reginald Brown, A.M.I.C.E., Public Offices, Southall	do.
Automatic Coal-tip	Great Western Railway Co.	Engineer, Paddington Station	May 10
Level Crossing Cottage at Purton, Wilts.....	do.	Engineer at Gloucester Station	do.
Station Buildings at Winscombe, Somerset	do.	Engineer at Bristol Station.....	do.
Brick Abutments for Bridge at Bamford	East Suffolk County Council	H. Miller, M.Inst.C.E., 16, Museum-street, Ipswich	do.
Vestry to Wesleyan Chapel at Pontshonnorton	.....	A. O. Evans, Architect, Pontypridd	do.
Road Works, Coronation-street, North Shields	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, Tynemouth	do.
Sewers, etc., Weald-lane, etc.	Brentwood U.D.C.	Messrs. Jones, Engs., Parliament-mans., Victoria-st., Westminster	do.
Steam Road Roller and Scarifier.....	Southampton Corporation	Borough Engineer, Market-chambers, 123, High-st., Southampton	do.
1,620 Tons of Blue Guernsey Granite	West Ashford R.D.C.	A. Sims, Surveyor to Council, Charing	do.
*Making-up Street	West Ham Borough Council	Borough Engineer, Town Hall, West Ham, E.	do.
Four Houses, Manor Royd Estate, Halifax	.....	R. Horsfall & Son, Architects, 22A, Commercial-street, Halifax ..	May 11
Materials—Street Works	Bradford Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford.....	do.
*Alterations, etc., Dispensary, Westminster Bridge-rd.	Lambeth Guardians.....	Guardians, Board Room & Offices, Brook-st., Kennington-rd., S.E.	do.
Street Improvement Works	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham.....	do.
Kerbing and Paving Works	do.	do.	do.
Four Ornamental Shelters, N. Shore, Marine Prom..	Blackpool Highway Committee....	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
Farmhouse at Gurnard's Head, Cornwall	Mr. Berriman	O. Caldwell, F.R.I.B.A., Penzance	do.
Hazel Slade Sewage Disposal Works	Lichfield R.D.C.	C. O. Rawstron, Surveyor, 20, Walsall-road, Lichfield	May 12

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Building to Carry Steel Service Tank at Tannochside	Lanark Middle Ward D. Committee	Crouch & Hogg, C.E., 53, Bothwell-street, Glasgow	May 12
Water Supply Works, Writtle	Chelmsford R.D.C.	J. Taylor, Sons, & Santo Crimp, Engs., 27, Gt. George-st., S.W.	do.
Manager's House, Knockands Distillery, Dalbeattie	.....	C. C. Doig, Architect, Elgin	do.
Three Workmen's Cottages	.....	do.	do.
Bacteria Beds	do.	do.	do.
Elementary School at Susworth, Scotter	.....	Scorer & Gamble, Architects, Bank-street-chambers, Lincoln	May 13
Black Fen Sewers	Lindsey Education Committee	A. Williams & Son, Engineers, 14, Victoria-street, Westminster	do.
Waterworks	Bexley U.D.C.	T. V. Pearse, Clerk, Wiveliscombe, Somerset	do.
Electric Lighting and Destructor Plant	Wiveliscombe U.D.C.	Ashton Bremner, Borough Electrical Eng., Market-bldgs., Burslem	May 14
Sewage Outfall Works	Burslem Corporation	H. Hulse, Borough Engineer, Droitwich	do.
Gas Engine, etc.	Droitwich Corporation	do.	do.
Granite Kerbing and Setts	do.	Engineer to the Council, Church End, Finchley	do.
20,000 yds. super. of Tarred Slag Macadam	Finchley U.D.C.	F. R. Ryman, Borough Surveyor, 8, St. Mary's-street, Stamford	May 16
Parochial Offices	Stamford Corporation	J. H. Martindale, architect, Viaduct-chambers, Carlisle	do.
Additions, etc., Technical School, Abbey Foregate	Wetheral Parish Council	W. Chapple Eddowes, Borough Surveyor, The Square, Shrewsbury	do.
Twenty Cars	Shrewsbury Borough Council	E. Hatton, Tramway Offices, 32, Blackfriars-street, Salford	do.
Two Rail Cleaners	Salford Tramways Committee	do.	do.
Electric Light Mains, etc.	do.	H. T. Sully, Consulting Eng., Scottish Widows'-buildings, Bristol	do.
Underground Lavatories at All Saints	Neath Corporation	City Surveyor's Office, Town Hall, Manchester	do.
*Painting, Colouring and Other Works	Manchester Corporation	Steward, Infirmary, Rackham-street, Notting Hill, W.	do.
*Wrought-iron Entrance Gates, Bromley Hill Cemetery	St. Marylebone Guardians	Bow Engineer, Municipal Offices, Bromley	May 17
*284 yds. of Dwarf Wall, etc., Bromley Hill Cemetery	Bromley Burial Board	do.	do.
*Cemetery Chapel	do.	Burial Board Offices, East-street, Bromley	do.
*Painting, etc., Infirmary, Fulham-road	do.	Clerk of Works and Workhouse adjoining	May 18
Repairs, etc., Union Workhouse, Cerne	St. George's Union	The Workhouse, Cerne, Dorset	May 21
Four-Ton Electric Wharf Cranes for Clydebank Dock	Guardians	G. H. Baxter, Engineer, 16, Robertson-street, Glasgow	May 23
Electrical Lighting Schemes, Monmouthshire Asylum	Clyde Navigation Trustees	Dr. J. Glendinning, Medical Superintend't at Asylum, Abergavenny	May 24
Twenty Movable Electric Cranes, Dock No. 9	Building Committee	W. H. Hunter, M.Inst.C.E., 41, Spring-gardens, Manchester	May 25
Electricity Supply Mains (Feeders and Distributors)	M'chester D'k & Wrhse Ex. Co., Ltd.	R. Hammond, M.Inst.C.E., 64, Victoria-street, Westminster, S.W.	May 26
Infectious Diseases Hospital, Newburn-on-Tyne	Hackney Borough Council	T. Gregory, Architect, Newburn-on-Tyne	do.
*New Schools	Gosforth, etc., Hospital Committee	W. B. Wood, Architect, 12, Queen-street, Gloucester	May 28
*Enlargement of Isolation Hospital	Gloucester Education Committee	H. Young, Architect, Bedford	May 31
Alterations, etc., to Knock Church, Queen's County	Biggleswade Joint Hospital Board	F. Bergin, 36, Westmoreland-street, Dublin	No date.
Congregational Church, Killamarsh	Very Rev. J. Connolly	W. Cecil Jackson, Architect, Knifesmith-gate, Chesterfield	do.
Rebuilding Primitive Methodist Chapel, Stavely Town	.....	W. J. Morley & Son, Architects, 269, Swan-arcade, Bradford	do.
Residence at The Wells, near Bromyard	.....	W. W. Robinson, Architect, 10, King-street, Hereford	do.
Sewage Purification Works, Thornhill	Captain R. L. Heygate	H. Dickson, C.E., 45, Queen-square, Edinburgh	do.
Wesleyan Church and School, Heckington, Lincoln	Dumfriesshire County Council	A. E. Lambert, Architect, 22, Park-row, Nottingham	do.
Rebuilding Licensed Premises, Belfast	.....	W. J. Moore, Architect, Royal-chambers, 35, Royal-avenue, Belfast	do.
Slating, etc., to House at Crosby-on-Eden	Mr. H. O'Neill	44, Howe-street, Carlisle	do.
Chapel, Lemington	.....	B. R. Irvin, Architect, 58, Avenue-road, Gateshead	do.
Tredegar Arms Hotel, Pill, Newport, Mon.	.....	Lansdowne & Griggs, Architects, Newport, Mon.	do.
House, Shop, & Printing Offi., St. Peter's-st., Ipswich	Mr. R. Stark, jun.	J. A. Scheuermann, Architect, 23, High-street, Ipswich	do.
Retort House in Stonework, etc.	.....	T. Newbigging & Son, 5, Norfolk-street, Manchester	do.
Alterations, etc., to Club Premises, Beckett-st., Leeds	Ferndale Gas Co., Ltd.	F. Mitchell, Architect, 9, Upper Fountaine-st., Albion-st., Leeds	do.
*100 Loads of Top Dressing for Football Fields	.....	Northern Polytechnic Institute, Holloway, N.	do.
8 Houses, House & Shop, Stables, etc., Blaenrhondda	Northern Polytechnic Institute	J. P. Williams, Architect, Taff-chambers, Pontypridd	do.
	Mr. J. Griffiths		

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	Chertsey Union	3*l.* 3s. per week	May 9
*Inspector of Buildings & Private Street Improvement	Beckenham U.D.C.	130*l.*	May 10
*Additional Manual Training Instructors in Woodw'k	School Board for London	Minimum 100*l.* per annum	May 23
*Assistant Manual Training Instructors in Woodwork	do.	Minimum 80*l.* per annum	do.

Those marked with an asterisk (*) are advertised in this Number. *Contracts*, iv. vi. viii. x. xii. *Public Appointments*, xix.

TENDERS—*Continued from page 479.*

For Gas Mains and Fittings for Schools in the South of London.

Messrs. W. G. Cannon & Sons, at the prices set out in the schedule, with an addition of 12½ per cent. to these prices.

Running Contracts for the Supply of various articles of Ironmongery.

(*a*) Messrs. F. Bird & Co. for the supply of (i.) Teachers' scuttles, at 4s. 3d. each; and (ii.) watering cans (double rose), at 2s. 9d. each.

(*b*) Messrs. Carter & Aynsley (Ltd.) for the supply of orderly boxes with lids, complete at £4 4s. per dozen.

(*c*) Messrs. Nettlefold & Sons for the supply of galvanised iron scuttles, at 1s. 10½d. each.

(*d*) Messrs. Pryke & Palmer for the supply of cinder sifters, at 13s. per dozen.

(*e*) Messrs. C. W. Smallbone & Son, for the supply of (i.) Laundry coppers (14 gallons), at £2 1s. 9d. each; and (ii.) Schoolkeeper's coppers, at 16s. each.

Wall Broom Heads and Rods—On Running Contracts.

Messrs. D. Clark & Sons for the supply of (i.) wall broom heads, at 5s. each, with 3 ft. fixed rods, and (ii.) ash rods (7 ft. long), at 1s. 6d. each.

Supply of Small Windsor Chairs.

Messrs. B. Cartwright & Son.. £12 10s. per 100

Running Contracts for the Supply of Linoleum.

Messrs. Treloar & Son .... 2s. 1d. per sq. yard

Running Contracts for the Supply of Materials for Repairing Oak Desks.

Bennett Furnishing Co. and the London School Furniture Co.

Running Contract for the Supply of Bentwood Stools.

Messrs. Atkinson & Co., of Westminster Bridge-road ..... £1 14s. per doz.

Running Contracts for the Supply of Various Articles of Furniture, etc.

(*a*) Messrs. Galbraith Bros., for the supply of (i.) Kindergarten stands, at £1 15s. 6d. each, and (ii.) boards, at 6s. 9d. each.

(*b*) School for the Indigent Blind for the supply of hampers for storing dumb-bells, at 14s. 3d. each.

Running Contracts for the Supply of Blinds.

(*a*) Messrs. Tidmarsh & Sons for items 1 to 4.
(*b*) Mrs. H. Evans for items 5 to 7.

Slate Slabs.

Messrs. G. M. Hammer & Co., for the supply of slate slabs, No. 1 at 12s. 6d. each, and No. 2 at 10s. each.

For Painting Schools.

				Amount included in Tender for minor repairs.
FINSBURY.				
Saffron-hill	£126 0 0	Stevens Bros.	£	58 0 0
Station-road	139 0 0	F. W. Harris		51 0 0
GREENWICH.				
Mantle-road	214 17 0	C. G. Jones		129 2 4
HACKNEY.				
Bonner-street	189 0 0	Marchant & Hirst		85 0 0
Curtain-road	148 15 0	J. Haydon & Sons		60 15 0
Redvers-street	190 0 0	Woollaston Bros.		90 0 0
Scawfell-street	181 11 6	H. Bouneau		119 5 0
EAST LAMBETH.				
Mawbey-road	204 0 0	E. Proctor & Son		90 0 0
Sumner-road (Graded School and Pupil Teachers' School)	235 0 0	W. Hooper		88 10 0
Wood's-road	135 0 0	Holliday & Greenwood (Ltd.)		63 0 0
SOUTHWARK.				
Pocock-street	188 10 0	J. F. Ford		80 0 0
Townsend-street	185 0 0	E. Triggs		93 0 0
Webb-street	162 0 0	E. Triggs		71 0 0
Weston-street	163 0 0	Rice & Son		80 0 0
TOWER HAMLETS.				
Portman-place (Boys' and Girls' departments)	171 0 0	Vigor & Co.		67 0 0
Rutland-street	129 2 9	H. Bouneau		69 9 0
St. Leonard's-rd.	220 0 0	Woollaston Bros.		110 0 0
St. Paul's-road	140 0 0	Vigor & Co.		69 0 0

LONDON.—For the making-up of portions of Cranbrook and Flanders roads, for the Urban District Council of Chiswick. Mr. John Barclay, Engineer and Surveyor, Town Hall, Chiswick:—

	Cranbrook-road.	Flanders-road.
T. Adams	£1,169 0 0	£911 0 0
J. Ball	1,066 0 0	850 0 0
F. Fowles	1,429 17 4	1,133 18 9
Lawrence & Thacker	1,040 0 0	*789 13 6
London & County Builders, Ltd.	1,252 8 8	932 15 8
G. R. Mann	1,209 14 0	958 5 0
J. Mowlem & Co.	1,106 0 0	911 0 0
W. Neave & Son	1,146 0 0	896 0 0
B. Nowell & Co.	1,120 0 0	834 0 0
Plumridge & Swaker	*855 19 9	879 9 0
T. Watson, jun.	1,128 0 0	932 3 10
Wilson, Border, & Co.	1,045 0 0	865 0 0
G. Wimpey & Co.	1,041 0 0	807 0 0
T. Rook	1,120 0 0	—

LONDON.—For erecting Lennox-buildings and Clere-cottages in Wandsworth-road, for the purpose of re-housing persons of the labouring class to be displaced by the widening of Nine-elms-lane, for the London County Council:—

Perry & Co. (Informal)	£11,950 0 0
Martin, Wells & Co., Ltd.	11,901 0 5
R. A. Lowe	11,821 7 6
Cropley Brothers, Ltd.	10,937 11 9
H. Lovatt	10,750 6 10
Leslie & Co., Ltd.	10,561 2 7
B. E. Nightingale	10,515 0 0
Kirk & Randall	10,430 18 6
Holloway Brothers (London), Ltd., Belvedere-road*	10,398 13 4

[The architect's estimate comparable with these tenders is £10,660.]

LONDON.—For making the borings necessary near the sites of certain works proposed for the relief of floodings in Battersea and Wandsworth, for the London County Council:—

Thos. Docwra & Son	£405 0 0
Le Grand and Sutcliff	227 6 0
S. F. Baker & Son, London*	163 2 6

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LONDON.—For the extension of the electric light generating station, for the Stepney Borough Council :—

F. & F. J. Wood	£19,558	0 0	W. Lawrence & Son	£14,986	0 0
W. Gregar & Son	18,290	0 0	Patman & Fotheringham, Ltd.	14,903	0 0
H. Godfrey	18,210	0 0	J. Smith & Sons, Ltd.	14,885	0 0
Thomas & Edge	17,449	0 0	Foster Bros.	14,882	0 0
J. E. Johnson & Son	17,447	0 0	F. G. Minter	14,748	0 0
M. Calnan & Son	16,959	0 0	H. Knight & Son	14,746	0 0
J. Ferguson & Co.	16,147	18 0	J. W. Jerram	14,537	0 0
A. E. Symes	16,000	0 0	H. Lovatt, Ltd.	14,325	0 0
Harris & Wardrop	15,964	0 0	J. Allen & Sons, Ltd.	13,985	0 0
J. Shelbourne & Co.	15,258	0 0	F. & E. Davey, Ltd.	13,957	0 0
L. F. Lamplough	15,169	0 0	F. & T. Thorne	13,200	0 0
S. E. Moss & Co.	15,000	0 0	B. E. Nightingale, Albert Embankment, S.E.*	12,921	0 0

LONDON.—For the reconstruction of sewers in the following streets :—Alfred-street, Arthur-street, Chapel-place, Lancelot-place, Middle-street, Montpelier-row, Montpelier-square (north), Montpelier-street, Raphael-street, Rutland-street, Sterling-street, Trevor-square, Vauxhall Bridge-road, and Warwick-street, for the Westminster City Council :—

Johnson & Langley	£13,575	8	6
Pedrette & Co.	13,316	12	2
C. Ford	11,884	0	0
C. W. Killingback & Co.	10,153	1	10
Pethick Bros.	9,649	16	3
J. Mowlem & Co., Ltd.	8,682	0	0
T. Adams	8,778	19	0
R. Ballard, Ltd.	8,295	0	0
E. Parry & Co.	7,868	7	6
A. J. Neave	7,716	10	1
W. Neave & Son	7,468	0	0
D. R. Paterson*	6,953	10	0

LONDON.—For the erection of a composite building at Hackney Marsh (refreshment room, cart shed, bothy, dressing room, conveniences, and store) for the London County Council :—

General Builders, Ltd.	£2,659 0 0
W. Duncan Tucker	2,525 0 0
S. Kind	2,307 0 0
T. Lapthorne & Co.	2,282 15 10
T. Pearce	2,226 19 0
M. Calnan & Sons	2,104 0 0
F. and T. Thorne, Isle of Dogs*	1,904 0 0

LONDON.—For the provision of wooden staging at the Belgrave Wharf for additional storage accommodation, for the Westminster City Council :—

W. Wright & Son	£250	0 0	T. Coulthard	£167	10 0
H. & E. Lea	192	0 0	T. W. Haylock	165	0 0
J. R. Sims*	182	0 0	Love & Co.	152	15 0

LONDON.—For the erection of a block of residential flats, to be called "Ringford House," West Hill, Wandsworth, S.W. Messrs. Palgrave & Co., architects, 28, Victoria-street, S.W. Quantities by Mr. James Farrell :—

J. Hollingsworth	£7,851	Foster Bros.	6,314
J. & M. Patrick	7,290	S. E. Moss & Co.	6,250
C. Gray	7,241	Cropley Bros	6,197
N. Lidstone	7,237	J. Hebblethwaite	6,196
Peerless, Dennis & Co.	6,876	G. Newton	6,172
Dean & Co.	6,604	Johnson & Co.	6,149
Martin, Wells, & Co.	6,475	A. Leather	6,138
F. G. Minter	6,350	R. Ward & Son, Battersea†	5,497
J. Ferguson & Co.	6,348		

NORWICH.—For the erection of Burlington-buildings, Oxford-place, Norwich, for Mr. C. Larking and others. Mr. J. Owen Bond, architect, 15, Upper King-street, Norwich. Quantities by the architect :—

Downing & Son	£5,566	J. Hurn	4,850
J. Holmes & Son	5,300	J. Youngs & Son	4,797
Scarles Bros.	4,900	T. W. Utting	4,782
J. S. Smith	4,900	T. Chill*	4,747

[All of Norwich.]

PLYMOUTH.—For alterations and additions to 73, George-street, for the Capital and Counties Bank, Ltd. Mr. A. G. Bewes, architect, 10, Courtenay-street, Plymouth. Quantities by Mr. S. W. Haughton, 22, Courtenay-street, Plymouth :—

Pearn Bros.	£4,445	Pethick Bros.	£4,244
G. B. Turpin	4,265	A. N. Coles*	4,200

[All of Plymouth.]

SKEWEN.—For the erection of a public library at Skewen, for the Coedfranc Parish Council. Mr. J. Cook Rees, architect, Neath :—

D. Davies	£2,245	Walters & Johns	£1,995
H. Billings	2,075	Price Bros., Cardiff*	1,899
Bennett Bros.	2,070		
D. Jenkins	2,025		
J. Davies	1,997		

SWANSEA.—For erecting an electricity station and offices at the Destructor Works, Llangyfelach-street, for the Corporation. Mr. G. Bell, Borough Surveyor :—

D. Jenkins	£1,800	J. Marles & Sons, Swansea*	£1,625
G. Davies	1,729		

THORNTON.—For erecting branch store and dwelling house, etc., in Market-street and Commercial-street, Thornton, Bradford, for the Queensbury Industrial Society. Mr. Medley Hall, architect and surveyor, 1, Harrison-road, Halifax :—

Mason: J. Hill & Son, Thornton*	£331	0 0
Joiner: W. Evans, Queensbury	200	0 0
Slater and Plasterer: J. Feather, Halifax*	44	14 9
Plumbing: W. Bairstow, Thornton*	37	10 0
Painting: W. Bairstow, Thornton*	12	10 0

WINSCOMBE (Somersetshire).—For erecting a house and stable, etc., at Sidcot, for Mr. J. Knott. Messrs. Hans Price & W. Jane, architects, Waterloo-street, Weston-super-Mare :—

Gleed Bros., Bridgewater	£1,480 0 0
A. H. Curtis, Shipham	1,423 19 10
W. A. Green, Clevedon	1,257 0 0
Ford & Son, Cheddar	1,232 0 0
C. Fear, Weston-super-Mare*‡	1,100 0 0

‡Accepted for house only at £950.

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London Agent :—Mr E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co.

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The Builder.

VOL. LXXXVI.—No. 3196. MAY 7, 1904

ILLUSTRATIONS.

South Wales University College, Cardiff:—

1. Bird's-eye View
2. Elevations
3. Ground Plan
4. First Floor Plan

.....Mr. W. D. Caröe, F.R.I.B.A., Architect.

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The Royal Academy Exhibition.

THE exhibition of this year contains no single picture which can be pointed to as the great picture of the year, and none which can exactly be said to be a great picture in the full sense of the word, which should imply a painting of the highest class of execution embodying a great or important subject. This year the pictures on serious subjects are not of the highest class of execution, and those which are of the highest class of execution deal rather with idyllic than with epic subjects. Nevertheless, this is a good exhibition, and above the average, for it contains a larger proportion than usual of really good and interesting works, from among which could be picked a collection that would outshine any other in London.

Last year the greatest picture was a sea painting—Mr. Hemy's "Youth," and though there is nothing so exceptional as that remarkable picture, yet this may be called a sea-painting year in view of the three works of this class placed near each other in Gallery VI. Mr. Robert W. Allan's "The Pitiless Sea" (380) is the largest and most important sea picture he has yet painted, and gives very finely the grey and waste appearance of the sea on a dull wintry day. Mr. Somerscales, who has been replaced on the line, gives, in "The Coast of the Desert of Tarapacá" (387), an equally true but totally different aspect of the sea; that of the deep sea showing dark under a breeze and a clear sky; this is a wonderfully true picture, both in the drawing and colour of the sea; in the way in which we see its curve between us and the distant shore; in the drawing of the ship (in which Mr. Somerscales is always first-rate); and in the painting of the distant high coast-line. Mr. Hemy gives us, in "Haul Aft" (396), another episode of the yacht-race which we saw in "Youth"; the boat is before the wind now, and the youth in white flannel has left the helm and come forward to assist in booming out a big foresail; the sea-water hisses and splashes as only Mr. Hemy can make it. Had we not seen "Youth" we might have found this picture as exciting; but it is not quite equal to it, as second editions of the same thing seldom are. Mr. Hemy, however, has another great success of a different kind in his "London River" (236), a remarkable study of the dirty Thames with the sunlight on it, and a steamer towing a ship; comparing it with "Haul Aft," one can say that the painter has really made one feel the difference between clear deep sea-water and dirty river-water; the smell of the salt is with the one, the smell of sewage with the other; that the one painter should have succeeded so well in both effects is no small triumph of art.

It is an allegory year too; but unfortunately the allegories are not equal to the situation. Mr. Solomon's "An Allegory" (240) is indeed a fine painting, by far the best thing he has ever done—in fact there is a gulf between it and his former works in regard to style and colour; but it fails to do what an allegorical picture should do—explain itself. The nearly nude figure of Christ is borne across the centre of the picture by angels, the head of Moses with the tables being seen in shadow behind; on the ground in the foreground are reclining revellers; in the middle distance appears to be a shipwreck, but what is the point of it all is not clear. Still, it is a fine picture; in an artistic sense it is all in keeping, and the colour is rich and harmonious. The other two large allegorical paintings are clear enough in their meaning, but unfortunately belong to the blatant order of art. Mr. Sauber represents "Mammon" (540) as a gold-armoured horseman trampling over things; one hoof of the horse is on Cupid's wing—all this is excellent and quite obvious moralising, but the picture is loud and staring in colour. The best thing in it is the way in which the old form of jousting helmet worn by the horseman is made to convey, quite naturally, an expression of sneering indifference. Mr. Goetze, in his "Despised and Rejected of Men" (526), has played once more the rather easily-made sensation, first started by M. Béraud, of contrasting the figure of Christ with typical figures of every-day modern life. In this case the Christ is carved in stone only; some of the figures—the two young "Smart Set" people, the fatuous face of the jockey in the rear, the professional nurse and professional cleric—are carefully and cleverly studied, and the picture is a somewhat telling piece of satire; but it is not beautiful or decorative, and that is the first duty of a picture; to point a moral is only a secondary office of art.

How remarkably this is emphasised on turning to such a picture as Mr.

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Furse's "Diana of the Uplands" (222), the picture which we should select were we offered the choice of one work out of this year's Academy. Here there is not only no allegory, but we may almost say no subject; only the figure of a *spirituelle* girl in a grey silk dress blowing in the wind, and holding in two greyhounds in a leash; but it is perfectly beautiful in the lines of the group, the expression of the girl, and the wild landscape and wind-blown clouds. This is true art, the making of the beautiful. Mr. Furse's other picture, "The Lilac Gown" (770), a study of a colour in the half-length of a lady with a sunshade, is equally artistic in type, though less attractive and with less inspiration than the other. But these are two real works of art, and in them Mr. Furse rises above the prevailing level of the new English Art Club, where he used to be chiefly known, and it is to be hoped that in future his works will be among the leading attractions of the Academy exhibitions.

Decorative art *par excellence* is supposed to be represented by Mr. Brangwyn's large and rather coarsely-executed painting, "Departure of Lancaster for the East Indies" (196), one of a series of decorative panels for the Skinners' Company. Decorative it is in the sense that the composition is flat and that every part of it is equally filled with detail; allegorical in a sense too, for we presume the figures are rather typical than real; but is it decorative in the finer sense of the word? We should hardly say so; the colour is harsh, and the large nearly black figure standing straight up in the middle of the canvas is rather irritating to the eye. The quality of being "decorative" depends surely on line and colour as much as on the choice of a conventional treatment. "Diana of the Uplands" is far more decorative than this; so is Mr. Solomon's "Allegory," the decorative quality of which is its greatest merit.

Among the other most important figure pictures the first room presents us with an allegory again, in Mr. Briton Riviere's "Youth" (17), the point of which seems to be the careless enjoyment of a young horseman on the edge of a gulf from which the frightened animal is backing. This is of course really an animal painting, and to achieve an animal painting and then give it an allegorical meaning is rather playing with the spectator, who feels that the allegory is only tacked on, as it were. Mr. Waterhouse's "Psyche opening the door into Cupid's Garden" (30) is another of those things in which a classical title does not disguise the very unclassical way of treating the subject; a cottage-girl Psyche is not a reading one can accept. The same lesson that we have already read, that great titles do not make great pictures, offers itself again in Mr. Waterhouse's other work "Boreas" (618), which though he has given a Greek name to the wind, is, like "Diana," simply an artistic composition of figure and landscape; a half-length of a girl blown about by the wind, but a real work of art, beautiful both in composition and colour. Mr. Stanhope Forbes's "A Rescue at Dawn" (61) is an effective picture of boatmen landing some people in a grey dawn, which contrasts with the lamplight in the shadow of the boat, but his most powerful work is further on in Gallery III.—"The Seine Boat" (167); not the river Seine, we presume, but a boat taking one end of a seine net; the figures and faces of the fishermen, in strong sunlight, are painted with great force, and the whole thing makes a picture, though rather of the realistic than of the artistic order. In the central place of Gallery II. Mr. Abbey's large picture, "A Measure" (114), must be a disappointment to those who remember some of the works by the same artist which have hung in the same place; it shows a staircase in a Renaissance palace, at the foot of which a lady is languidly dancing, with a sad expression on a face that impresses one as only half-finished. In the same room Sir E. Poynter's "The Nymph's Bathing Place" (141) is a beautifully drawn nude in a rather unsatisfactory landscape, but the figure itself is worth a good deal, apart from its surroundings. His larger painting in Gallery III., "Asterie" (246), a three-quarter length of a Roman girl who "looks from her lattice high" in spite of a Latin quotation which recommends her not to do so, is chiefly acceptable for the fine painting of the head and also of various accessories; otherwise not a very interesting picture. Nor is Sir L. Alma-Tadema's "The Ever-New Horizon" (252), three classic maidens looking from a marble-built terrace over the sea except in respect of colour; it has hardly the beautiful finish of his best work; but the delicate colour-harmony of the three draperies, with the bright yellow flower breaking against one of them, gives us one form of pleasure of the eye in the highest degree. In the same room is Mr. Draper's large and ambitious picture "The Golden Fleece" (199), the most important thing in scale and subject that he has yet produced, taking the moment when Medea cast her young brother into the sea that the duty of picking him up might delay her father's ship. The great golden fleece is piled in the middle of the ship; the figures are full of energy, and the mass of sail of the pursuing ship has a fine effect, but the shooting at it with a very small bow seems an absurdly inadequate attack, and the way the oars are shown, passed through holes in the thick bulwark in such a way that they could hardly be worked at all, is one of the instances we sometimes see of the unpracticality of painters. Another is shown in Mr. Wollen's well painted but absurd picture of the decisive moment at "Waterloo" (191), where, in order to bring Wellington into the middle of the picture, he is placed between the contending armies in a situation where no commander-chief could have any business to be if he valued his life; and one may be quite sure that Wellington had too much sense of his proper duty in the battle to have exposed himself in that way. That is a piece of clap-trap painted to catch the crowd; a painter of a battle picture ought to have known better.

Mr. Hatherell's large picture of the Guildhall banquet with the King and Queen as guests (267) is, we suppose, the kind of picture that is painted to order; such things are unavoidable, but they are rather documents than art; the thing is well done of its kind. In this room are some of those pictures which aim especially at effects of light to which everything else is sacrificed; in Mr. La Thangue's "From a Ligurian Spring" (297) the sunlight, where the shadow stops, is laid on in such thick flakes as to defeat its own end; and in Mr. Clausen's "Gleaners Coming Home" (258) we seem almost to lose the figures for the light; it is an effect, in short, rather than a picture; and seeing that it is essentially a foreground painting, surely a little more attention should have been given to texture; it is difficult to tell whether the load carried by the central figure is a large stone or (as seems to be intended) a full sack.

In the next gallery the central place is occupied by Miss Kemp-Welch's large and vigorous work, "Timber-hauling in the New Forest" (330), an extended forest scene, in the foreground of which a team of horses are straining up a bank. Miss Kemp-Welch went into another class of subject last year, which interested us; but on the whole she is wise in, to use a sporting phrase, "coming back to her horses"; they are her strong point, and with them she has at present no rival. Mr. John Collier's group of "Mrs. Kendal, Miss Ellen Terry, and Mr. Tree, in 'Merry Wives of Windsor'" (470) can hardly be classed as a mere portrait group; the painter has aimed at a Shakspeare scene, and it is a very able performance; the look of doubt and consternation on Falstaff's face is admirable, but his manner is incorrect according to the scene; he appears to be unwillingly pushed and cajoled towards the "buck-basket" (which appears on the right), whereas he was very anxious to hide in it—"Let me see it! Let me see it!" Possibly the picture may represent Mr. Tree's reading of the scene, but it is not Shakspeare's. Mr. Dendy Sadler's interior, "The Harvest Home" (476) is a good specimen of the realistic rendering of everyday life, which has its value no doubt, but of a rather secondary order; his picture of three gentlemen of the old school—"After Dinner Rest Awhile" (841) is a superior work both in humour and in artistic finish, and of its kind admirable. In Gallery X. we have another of the ceremonial pictures painted to order, and a formidably large one, "The Opening of the First Parliament of the Australian Commonwealth" (768), by Mr. Tom Roberts. This was a great historical event which might very well be celebrated in painting; it is difficult, no doubt to give artistic interest to such a subject, still there are men who could do it, though they do not seem to be generally selected. Perhaps, however, it is supposed to be one of the uses of this class of commission, that it gives employment to painters of whom we do not hear much otherwise.

We have not space this week to speak of portraits and landscape, but we shall have something to say on these in a further article, and also on some of the very interesting and in some cases very beautiful pictures which, though small and unobtrusive in scale, are as well worth appreciative notice as the larger and more important works which form the most prominent features of this year's exhibition.

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THE HOUSE OF LORDS ON THE LAW OF LIGHT.

THE decision of the House of Lords on Monday last in the now celebrated case of the Home and Colonial Stores *v.* Colls, illustrates again the far-reaching effect of the judgments of the Higher Courts on the life of the community. The case above mentioned finally sets at rest a question which, as Lord Macnaughten said, has been elucidated or obscured by a mass of cases. The point at issue, as our readers will remember, was whether the plaintiffs were entitled to what may be called a reasonable amount of light, or whether they were entitled to the full amount enjoyed previous to the legal proceedings, even though the diminution of the amount did not render the premises substantially less useful as a place of business? The House of Lords has now decided that the claim for an extraordinary amount of light cannot be sustained. The decision does not go so far as deciding that it may not be claimed after an enjoyment of twenty years, though the general tenor of the judgment is against such a claim. It has always been difficult to reconcile it with the principle that in order to enable the owner of a dominant tenement to succeed in an action for infringement of light, he must show that his premises are substantially less useful, so as to interfere with the ordinary occupations of life. In the present case the judge of first instance found that "after the erection of the defendant's building the plaintiffs' premises would still be well and sufficiently lighted for all ordinary purposes of occupancy as a place of business." But the Court of Appeal held that this was not a finding sufficient for the plaintiffs' case, because it admitted that some light had been taken away, and that the plaintiffs' were entitled to all the light which had entered the windows during the past twenty years. The basis of this judgment of the Court of Appeal, said the Lord Chancellor, rested on a false analogy, "as though the access and enjoyment of light constituted a sort of proprietary right in the light itself," whereas the basis of the right of action is not a proprietorial right, but a right of the owner of the dominant tenement to enjoy the use of his premises in a reasonable way. We take it, therefore, that this enunciation of the law must demolish the right which in some cases it has been said that the owner of a dominant tenement has to the use of an extraordinary quantity of light for a special purpose after twenty years' enjoyment, because such right is really based on the proprietorial idea, and not on that of a right to a reasonable use of premises. If a man chooses to exercise some special calling he cannot ask for special rights above those of his neighbour; he is only entitled to be allowed to use his premises as a reasonable and ordinary occupier would do. But we need not go at length into this secondary point; the main part of our business is to note that the House of Lords has swept away the various conflicting decisions, and has placed this particular portion of the law of light in a clear and uncontrovertible position—a position which, whether we agree with it or not, is and must remain the law of England on this point—one of very great importance at the present time.

We give under our legal heading a report of the case, with the judgment pronounced by two of the learned judges, and we shall give in our next the words of the two other judges, so as to place the terms of this important decision fully on record in our pages.

We cannot conclude our remarks without a word of recognition of the public service which Messrs. Colls and Sons have done in persisting, at the risk of heavy loss to themselves, in contesting a case which, though small in scale, involved questions of such great importance to those concerned in building in London and in other crowded cities. They have been instrumental in procuring a judgment which will tend to remove in future a great many opportunities of what may be called legal injustice; and they merit the thanks of the community, as well as congratulations on their own account.

NOTES.

The Chapel of the Pyx. THE lecture on Westminster Abbey given by the Dean of Westminster last week, at the Royal Institution, was rather of importance historically than architecturally; but we fully concur and sympathise with him in his remarks on the present unsatisfactory and anomalous condition of the ancient chapel of the Pyx, now divided by stone and brick walls into four small compartments, and removed from the custody of the authorities of the Abbey. The Dean's vision of a possible future for this portion of the Abbey, when we might see these four vaults united into one long chamber, with the old altar repaired, so that people might worship once more in the only portion of the Abbey which takes us back to the time of Edward the Confessor, is a vision which ought to be realised, and which we hope may be realised; for it is certain that in the present day, when people are not indifferent to the ancient history of ancient buildings, there would be an influential public feeling in favour of it.

Brickwork and Stone Facing. WE have received a request to name some application which would protect stone facing from the effect of the acid in the brick backing on the stone. There is perhaps some misunderstanding as to the real nature of the difficulty in such a case. As a rule the exudations from brickwork are alkaline, not acid. These alkaline salts (chlorides and sulphates of soda, lime, and magnesia), are hygroscopic, and, therefore, keep the brickwork perpetually damp unless it is exposed to rains, which dissolve the salts and wash them away. If the brickwork is faced with limestone before these alkaline salts have been removed, the salts would probably find their way to the stone and cause exfoliation. If the exudations are really acid, the best treatment would probably be to apply limewash. The lime would neutralise the acid; but we have never heard of such a case. Any treatment (such as steeping the stone in silicate of soda) which would protect the stone from atmospheric acids would also protect it from acid exudations from brickwork. But if it is really protection from alkaline hygroscopic salts that is required, in that case no treatment save that of allowing the brickwork to become seasoned before placing the stone in position would be entirely satisfactory.

Effect of Heat on Cast Iron and Steel. EVIDENCE of the necessity for precise knowledge as to the behaviour of metals under the influence of high temperatures is afforded by some circumstances observed during the inspection of a sixteen-story building at Baltimore. It appears that although the entire contents of this structure were consumed in the recent fire, the steel framework suffered no perceptible distortion or injury. On the other hand, the cast iron door and window frames, which were set in granite, expanded to a very considerable extent, this expansion being permanent and very noticeable. The effect naturally was to cause serious distortion of the framework, which was particularly marked in the case of iron mullions of the high office windows. Many of these were bent several inches from a straight line, and in some cases the bends would be better described as "buckles." None of those who have hitherto directed attention in the technical press to the bending and buckling of cast iron during this fire appear to be aware of the fact that the metal has permanently increased in volume under the influence of heat. Permanent growth of this kind not only destroys the usefulness of cast iron after it has been subjected to high temperature, but also constitutes a source of danger by affording means of ingress for flames as soon as the metal becomes distorted. These points should be remembered by architects and constructional engineers, by whom it may be hoped that so unsuitable a material as cast iron will not in future be employed for the frames of either doors or windows in buildings which are intended to be of fire-resisting construction.

Power Station Design. THE paper on "Power Station Design," by Messrs. Merz and McLellan, which was read to the Institution of Electrical Engineers last week, treats of a subject of great commercial importance at the present time. Power stations for supplying electricity for power, traction, and lighting over considerable areas are now working in various parts of the country, and many more will shortly begin working. What impressed us most in this paper was the apparent simplicity of the whole problem. Three-phase transmission was taken for granted. The boilers have to be placed as near as possible to the engines, so that the steam pipes are as short as possible. Each boiler, engine, and dynamo forms a complete unit, so that a machine can be shut down for inspection or repair with no trouble, and the risks of a breakdown are reduced to a minimum. The switchboard is made as simple as possible, care being taken to avoid crossing any

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cables, and the switches on the high-pressure circuits being operated electrically by motors worked by low-tension currents, so as to minimise the risks to the attendants. The authors were of opinion that steam turbines were the most suitable engines for driving alternators, and they quoted figures showing the economies effected by their use at the Newcastle Power Station. In one case a 3,000 horse-power turbine ran for 7,500 hours without ever having been opened up. The difficulty of obtaining intelligent labourers was mentioned, yet the authors were of opinion that labour-saving apparatus like mechanical stokers, coal-handling plant, etc., was not economical. In a case quoted the capital and repair charges exceeded by 200 per cent. the economy in wages effected, showing that the expenditure on the labour-saving appliances was far from being justified. Mr. Addenbrooke in the subsequent discussion stated that an average power station required nearly a million gallons of water per hour for condensing purposes, and so a plentiful supply of water was a necessity for such a station. It seems to us that large power stations are more suited to this country, with its comparatively speaking dense population, than small, isolated central stations. The cheap supply of power for factories and for electric traction must have important consequences industrially and socially in the immediate future.

The Electrolysis of Water and Gas Mains.

THE question of the electrolysis of gas and water mains caused by the leakage of electric currents from the tramway-rail was recently discussed by Mr. A. B. Herrick in the *Street Railway Journal* of New York. He points out that the difference of electric pressure between the power station and the farthest point of the rails in a tramway system is not a measure of the amount of the leakage currents. These vary with the conductivity of the soil in the neighbourhood of the rails. In some places a very minute difference of electric pressure will give rise to enormous currents. In other places the difference may be large without producing any appreciable current. In the Board of Trade Rules in this country it is specified that this difference must not exceed seven volts. It seems to us that this regulation might easily be made more scientific. Mr. Herrick mentions that the pitting which is often observed on the surface of a water pipe is not necessarily caused by electrolytic action due to leakage currents. If free particles of carbon have been left in the steel after it has been rolled it is easy to understand how this pitting takes place. The action would be a purely local one, the particle of carbon forming one pole, the surrounding steel the other, and the moist earth forming the electrolyte. The pits formed would be filled with a graphitic substance which could be scraped out with a knife. Pipes pitted in this way have been found in towns which have no electric supply for either lighting or traction. The pitting due to electrolysis is practically indistinguishable from the effects of local action, but it must, however, be a far more frequent cause of the deterioration of steel pipes. Mr. Herrick says that the developed fibrous structure of the metal may possibly also in some cases be due to other causes. In lead pipes the surest indications of electrolysis are the veinings of carbonate of lead found in the surrounding soil in the direction of the leakage currents. The author suggests a simple method of testing for electrolytic action. Two similar sheaths concentric with the pipe and made of the same metal are placed round it. One of them is connected to the pipe by a piece of metal. They are carefully weighed before being put in the earth and are weighed again some months afterwards. The difference in weight will indicate whether electrolytic action has been taking place or not. The methods Mr. Herrick gives of protecting pipe-work systems are deserving of careful study.

Birmingham Theatre Rules.

THE new theatre regulations of the City of Birmingham are of an eminently practical character. Rule 10 states that scenery and draperies on the stage shall be fire-resisting, and Rule 22 requires that sprinklers must be provided for the stage and other parts of the building where the risk of fire is great. If these two rules are duly enforced, a great deal will have been done to prevent a fire having fatal results in Birmingham; but we, of course, fully appreciate that there must be a considerable difficulty in thoroughly enforcing these rules in a town which is frequently visited by touring companies whose scenery is too often of the frayed and highly-inflammable description that is anything but fire-resisting. Due notice should be given to all touring companies that only flame-proof scenery can be used within the Birmingham area, and the sooner this is notified to the various managements concerned the less friction there will be. The regulations for the Birmingham theatres show a far greater grasp of the question of theatre safety than is, as a rule, found in provincial centres, and the local authorities, with their advisors, are to be congratulated upon them.

Kensington Gardens.

A FEW years ago we directed attention to the spoliation of one of the most pleasant footpaths beneath the trees across the gardens by its conversion into a straight gravelled walk, from Marlborough-gate towards Queen's-gate, in the Gore. We observe that yet another and equally charming footpath is being cut up, and that the turf is removed preparatory, it seems, to its treatment in the same formal fashion. In that case we shall be deprived of the pathway across the grass between Bayswater-hill and the gate at the south-east corner of the gardens. The path is not much frequented, and its agreeableness is enhanced by the circumstance that it is shaded by trees on only one side; the western side is mainly open ground, and thus affords a pleasing view of the lawns and avenues of the gardens in the afternoon of a bright summer's day.

The Old Coaching-Inns in Holborn.

A FIRM of outfitters are about to extend their premises, recently erected, from Mr. Joseph Sawyer's designs, at the corner (east) of Leather-lane, by taking in some adjoining houses in Holborn. One house, No. 122, marked by its large and finely-modelled sign of a black bull, has been, with its former next-door neighbour, the Old Bell, a famous house of call for mail and stage coaches in its day; and until twenty years ago the coach to Amersham and Wendover ran from the Old Bell. The galleried yard of the Black Bull was taken some years since for the erection of working-class dwellings. The front of the adjoining inn, No. 123, was rebuilt in 1720; the "galleries" and "boxes" around the yard were much older, and remained until the demolition of the premises in February, 1900, for a railway receiving-office and a restaurant. The authenticated history of the Old Bell, formerly the Bell, or Blue Bell, begins, it seems, with a record of its sale for 40*l.* by William Barde to Richard Hunt by a conveyance dated March 14, 1538; in May, 1722, it was sold by Joseph Gregge for 2,114*l.* to Christ Hospital, of which the almoners are the present ground landlords. The coat-of-arms on the front were preserved for the Guildhall Museum, and have been identified as those, quarterly, of Gregge of Bradley, Cheshire, and Starkye of Stretton, with the Gregge crest, and not, as is commonly stated, of the Fowlers, lords of Barnsbury Manor, Islington, *temp.* Elizabeth. In 1899 were pulled down Ridler's Hotel, a comfortable resort of old-fashioned folk; the two quaint old houses, Nos. 129-131, having bayed fronts; and the Horse and Groom in Leather-lane at the rear, for Mr. A. Waterhouse's enlargement of the Prudential Assurance Company's offices (see our illustration of September 2, 1899). The Black Bull, established in the middle of the XVIIth century, was the headquarters of the coaches that ran to Cambridge and the Eastern counties. With it disappears the last of the coaching-inns in that part of the main road, and another, the Saracen's Head, in Snow-hill, recently rebuilt, is just placed in the market.

The Lefèvre Galleries.

MESSRS. LEFÈVRE AND SONS have a small collection of pictures on view at their gallery in King-street, St. James's, including Rosa Bonheur's celebrated picture of "The Duel," representing a historical fight between two horses. There are also some studies of dogs by the same great artist, which are among the last things she did, and a fine black and white study of the head of a lioness. Among the other pictures is a particularly fine example of Cotman, "Off the Norfolk Coast," unusual as being a study of rough sea, as Cotman's sea-pieces were more generally representations of calm sea. Gallait's old picture, painted many years ago, of the bodies of Counts Egmont and Hoorne lying in state, it is interesting to see again, though it will hardly take the position now that it did when first painted.

A Sane Criticism on Whistler.

IN his speech at the Royal Academy dinner, the President of the Academy made some remarks on Whistler and his place in art which may be commended to the

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attention of the *quidnunc* school of art-critics who have exalted Whistler into a kind of faultless idol among artists. Doing full justice to the originality of Whistler's genius, as shown in "a natural grace and the most exquisite and ethereal scheme of colour that has ever been put upon canvas," Sir E. Poynter remarked that:—

"The brilliant resources of his wit supplied him with admirable reasons for carrying his work no further than inclination prompted. His followers and imitators quickly seized the situation, and gladly hailed an authority which seemed to give them a dispensation from the irksome necessity of learning their craft to completion; and the art of leaving off when the difficulties begin is, I am afraid, the heritage of this gifted artist."

That is just about the truth of it in a nutshell; and the judgment comes with the more weight in that it comes from the finest and most learned and painstaking draughtsman of his day, and the President of an institution which, whatever its shortcomings or mistakes, has the merit of having consistently upheld a high and sound standard of execution in art, which is perhaps the most manifest and practical duty of an academy of art. An academy cannot create genius, but it can maintain a standard of executive training, and it is the great merit of the Royal Academy that it has at least consistently kept that object in view.

LETTER FROM PARIS.

M. CHEDANNE, the architect to the Ministry of Foreign Affairs, is to commence shortly the erection of the new Hôtel of the French Embassy at Vienna. The interior decoration of the building is to consist of a series of tapestries from the Gobelins manufactory, for which cartoons have been commissioned from M. Hannotin, the painter, who designed the two tapestries now in course of execution for the Elysée Palace and the Cour de Cassation. The tapestries for the Embassy at Vienna are to represent the châteaux in the neighbourhood of Paris in the XIXth century, and will thus form a kind of pendant to the celebrated series of Châteaux de France, carried out at the Gobelins in the XVIIth century, from the designs of Le Brun.

The excavations which have been carried on for some months in the neighbourhood of the Collège de France have enabled the "Vieux Paris" Committee to determine a considerable part of the plan of a Roman monument of considerable interest. It is hoped that the further prosecution of the work will lead to some important discoveries in regard to the history of old Paris.

There is to be exhibited shortly at the Louvre, in one of the galleries underneath the new Rubens Gallery, an Egyptian sepulchral chamber or Mastaba, dating from the Fifth Dynasty, which was discovered last year on the plain of Ghizeh, by M. Georges Bénedite, the curator of Egyptian antiquities of the Louvre. This monument, which is 4.72 mètres long, 1.82 mètres wide, and 5 mètres in height, forms a quadrangular chapel of pyramidal section, decorated with bas-reliefs representing funeral ceremonies, as well as scenes and incidents in the daily life of ancient Egypt.

The collection of ancient and modern pictures belonging to the well-known publisher of Tours, M. Mame, has been sold at the Georges Petit Gallery: and, strange to say, it was the modern works which brought the highest prices. The "Mère de Calvin" by Holbein went for 30,000 francs; a portrait by Mantegna for 34,000; but a landscape by Corot, and not one of his best, went for 103,000 francs; a sale which was regarded as rather sensational. At the same gallery Mdlle. Breslau has arranged an exhibition of pictures and pastels of considerable interest and originality of style; among them a fine portrait of the sculptor Carriès, which will probably find place in the municipal collection at the Petit Palais.

A curious exhibition of photographs, organised by the "Photo-club de Paris," has been opened at the Petit Palais, which contains examples of work which may almost be said to rank as art-work. The Paris municipal authorities have taken great interest in this exhibition of photographs which are records of Paris topography, regarding this as a kind of complement to the Carnavalet Museum; and it is intended to have another photographic exhibition in December (also at the Petit Palais), consisting of views of the Bièvre within Paris, the district of old Montmartre, and views of some private gardens of special interest which have hitherto escaped being swept away in the march of improvement; though such gardens are becoming more and more rare in Paris.

Among other exhibitions that of the works of the painter Romain Cazes, just opened at the Ecole des Beaux-Arts, is worth mention. It consists of portraits and paintings of religious subjects, rather hard in style but with very fine qualities of drawing and composition, such as might have been expected from one who was the favourite pupil of Ingres.

Two new losses have to be recorded in the ranks of the Société Centrale des Architectes. M. Henry le Clerc, who has died at the age of sixty-five, was a pupil of Hippolyte Le Bas and of Ginain, and collaborated with the latter architect in the erection of the church of Nôtre Dame des Champs and in that of the Ecole Pratique de Médecine. He carried out numerous buildings—chateaux, schools, and one or two important churches. We have to record also the death, at the age of fifty-two, of M. Ernest Duquesne, a former pupil of Questel.

THE INSTITUTE OF SANITARY ENGINEERS:

COMBINED DRAINAGE.

A MEETING of the Institute of Sanitary Engineers, Limited, was held on the 13th ult. at No. 19, Bloomsbury-square, W.C., when Mr. A. A. H. Scott opened a discussion on "Combined Drainage." In the course of his remarks he said he could not understand how it was that for all these years it had been left to the legal profession to decide points as to combined drainage, whereas it was purely a technical matter, which could and ought to be settled by a professional arbitrator. The point that seemed to be most before the Courts was the definition of certain items used in the Public Health Act, 1875, such as definition of "drain," "sewer," "owner"; and arising out of the definition of "drain" came the question as to what was the "same curtilage," and who was the "owner," and again, there were various points under the Public Health Acts Amendment Act, 1890 (53 & 54 Vict. c. 59). In the 1875 Act, the definition of "drain" was, viz.: "Drain" means "any drain of and used for the drainage of one building only, or premises within the same curtilage, and made merely for the purpose of communicating therefrom with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed," and the definition of "sewer" in the Public Health Act, 1875, was, "sewer" includes "sewers" and "drains" of every description, except "drains" to which the word "drain" interpreted as aforesaid applied, and except drains vested in or under the control of any authority having the management of roads and not being a local authority under this Act. One point he should like to raise was: What are "drains"? Do we include the soil and lead pipes, etc., within the house? Generally speaking, only horizontal pipes, and even then not the small leaden ones, can be drains. Of course, if an Act expressly defined drains as including sink-conductors, etc., then of course they were included, as in the Glasgow Police Act. From the case of Holland *v.* Lazarus we were forced to include gutter down pipes as drains, and the fact that they were not within the sanitary part of the Act would not exclude them (see Sykes *v.* Sowerby, 1901). And yet in section 25, part III. of the Public Health Act, one could not build a house until the drains had been constructed; now, as a down pipe was a drain, it was somewhat awkward to comply with section 25. He mentioned this only to show that the Act was open to peculiar construction. Then as to "same curtilage," this term had been defined by the Courts in most extraordinary ways (that was, from an architect and sanitary engineer's point of view; probably it was very clear to the legal mind.) Mr. Barker, barrister, of Newcastle-on-Tyne, had dealt with this matter in a lecture published in the R.I.B.A. Journal, from which we find that there are four considerations to be taken into account in deciding whether premises are one or more than one: (1) An actual ring fence round the premises, or in other words the fact that the premises are not divided by roads or property belonging to others, or used by the public. This is an element of union, but will not necessarily unite two buildings. (2) Private communication between parts of the premises—that is to say, the possibility of going from one to the other without touching roads or property belonging to others or used by the public. Private communication is, of course, a very powerful uniting factor. (3) The necessity of one part of the premises to the other or others, which causes the law to overlook and ignore the division between. (4) The fact that the occupier of one part of the premises is the occupier of the other has a uniting effect. A letting out of part of the premises has sometimes a severing effect. According to the recent appeal case of Wilkinson *v.* Llandaff Rural District Council, it was decided that an open channel across the pavement, over which the rain-water discharged from the house, was decided to be a "sewer." There was another point to bring forward, *i.e.*, the repair of combined drains. He believed that some of his hearers had started to repair under notice from the Council, and after they had commenced to execute the work, they found it was a "sewer" and not a "drain," and the question arose then, who was to pay for the work already done? Now, in Florence *v.* The Paddington Vestry (December, 1895), the owner succeeded in making good his claim. It appeared from later cases that the whole question rested entirely upon the notice from the Council. In Klett *v.* Camberwell Vestry (August, 1896), it was decided that as the notice was only a mere intimation by their officer, the plaintiff could not recover. In the case of Andrew *v.* St. Olave's Board of Works (July, 1898), the Queen's Bench Divisional Court decided that the notice, which was issued in accordance with section 4 of the Public Health (London) Act, 1891, was more than a request or intimation, as it required the plaintiff to do the work within fourteen days, under a penalty of 10*l.*, and he had, therefore, acted under stress of compulsion in repairing a "sewer." And again, in North and Millhouse *v.* Walthamstow Urban District Council (November, 1898), the case was decided for the plaintiff on similar grounds, the notice there requiring the work to be done within seven days. Mr. Justice Channell said, "The question is, what degree of compulsion is necessary to entitle the plaintiff to recover? The compulsion need not be irresistible. If a public body comes to a person, and either commences or threatens proceedings, such person is no longer a volunteer. There was no legal compulsion, but a mere indirect compulsion is sufficient." In Proctor *v.* Mayor of Islington, the sanitary inspector gave a notice that the drains were in a defective condition, and it was decided by Mr. Justice Wright that the plaintiff had not done the work under compulsion, and therefore could not recover. At Buxton they were trying to treat this matter of combined drainage in a satisfactory manner, and they had (when the Institute held their annual summer meeting there) a Bill in Parliament, giving certain powers to the council which they hoped would clear many difficulties. It was a pity that the Government did not take some decided steps to put the matter on a satisfactory footing. Last June there was a deputation to Mr. Long over this matter, and he said he would give the matter his careful consideration, but nothing that we know of had been done yet.

Mr. Scott then took the case of a row of six cottages, which it was proposed to drain by combined drainage with one connexion to the sewer. By doing this, he said, you are only raising different points for the future generations. If (as in many cases it does happen) in a few years it is decided to make these cottages into shops, it may be found desirable to put an extension at the back, probably with a basement; in that case one could see what a difficulty they would have in dealing with the drain, which would probably drain five houses, and they would have either to spend a lot of money diverting the drain, or else to forego the basement and extension. Now with regard to the cost, to drain six houses on the combined system would cost about 25*l.* each, whereas if they drained each house separately

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it would cost 33*l.* each. This little extra cost of 8*l.* equalled at 7 per cent. only an additional amount of 12s. per year in the rent, or about only 1½d. per week additional rent per house. He suggested that in future all combined drainage (which he considered undesirable in every way) should be an unknown factor in new buildings, and each house have its own connexion to the sewer, etc.

In the discussion which followed Mr. J. T. Griffin (Chairman of Council), H. M. Dove, E. R. Palmer, R. Wright, R. Horton, G. W. Chilvers, and F. Britton took part, and a vote of thanks was accorded to Mr. Scott for his remarks.

ART UNION OF LONDON.

A GENERAL meeting of members of the Art Union of London was held on Thursday last week, by permission of the Council of the Society of Arts, at the Lecture-room, 18, John-street, Adelphi, when the report of the Council was received and the prizes of works of art distributed. In the unavoidable absence of Lord Windsor, the chair was taken by Mr. R. Biddulph Martin, M.P.

The sixty-eighth annual report of the Council, read by Mr. F. Marriott (Secretary), referred first to the loss the Society had sustained by the death of Sir Charles Nicholson, Bart., and Mr. T. O. Donaldson, M.Inst.C.E. The vacancies had been filled by the election of Mr. Archibald Donaldson and Mr. A. H. Brice. After appropriating a sum of 1,134*l.* to the expenses of the annual engraving and other works of art presented to subscribers, the Council had been enabled to set aside a sum of 378*l.* for prizes to be drawn for that day—making, with the consolation prizes awarded during the year, a total of 196 prizes. Among the works selected by the Council, and given as prizes that day, were a number of pieces of Doulton pottery, which had been specially prepared with a view to exhibition at St. Louis, but which, in response to a request from the Council, had been very kindly reserved for the Society. They were unusually fine specimens of the potter's art, and would do credit to one of the most important of British art industries wherever they might go. The portfolios of Brandard etchings formed another interesting feature of the prize list. A selection had been made from a number of plates purchased by the Society from the widow of the late Robert Brandard, and the statuette "Hero," of which a copy in bronze formed one of the principal prizes at the distribution, was selected by the late Lord Leighton from among a large number of competing designs for the premium of 150*l.* offered by the Society. It was a universally admired figure, and had been several times in requisition for exhibition purposes as a representative work of British women sculptors. The First Lord of the Admiralty having publicly expressed the hope that gifts of paintings and engravings of naval subjects might be made to the new Royal colleges at Osborne and Dartmouth, the Council had presented to each of these institutions a complete framed set of the naval engravings which had been issued by the Society, viz., "The Death of Nelson," "The Attack of the Vanguard," "The Loss of the 'Revenge,'" "The Escape of the 'Calliope,'" and "Victoria Victrix."

As the subject for the coming year's presentation etching, the Council had chosen the picture by Mr. Alfred East, A.R.A., entitled "The Miller's Meadow," which was exhibited in the New Gallery Exhibition of last year. The picture was selected by the Royal Commission as a representative British painting for the forthcoming exhibition at St. Louis. Unfortunately, the necessity for the canvas being in the engraver's hands until the present moment prevented its being sent to America. Mr. C. O. Murray had been wonderfully successful in his etching. In writing to the Secretary, Mr. East says:—"I consider it a most excellent reproduction of my picture; the feeling of the original is expressed in a most admirable way, and I am very pleased with the result." The Council felt that they were greatly to be congratulated upon their choice of an etcher for a picture whose subtle qualities presented unusual difficulties of translation, and they believed that the publication of the work would be regarded as an event of distinct importance in the engraving world.

The Council were still unable to report any alteration in the recent Canadian law prohibiting the operations of art unions within the Dominion, but it is hoped that during the present session the desired legislation may be secured.

The report proceeded to deal with the additions that had taken place during the year to the National Gallery, the National Portrait Gallery, the Department of Prints and Drawings at the British Museum, and the Victoria and Albert Museum. The subject of the housing and management of the Scottish National Gallery had been recently under examination by a competent committee, of whom Sir Walter Armstrong was one. At present no definite decision had been arrived at, though a suggestion had been put forward that the National Gallery trustees should endeavour to acquire for their purpose the fine buildings at present occupied by the Royal High School of Edinburgh. Further additions had been made to the collections of the Birmingham Corporation Art Gallery, the Walker Art Gallery in Liverpool, the Oldham Collection, and the Council congratulated Leeds on the successful completion of its scheme for the embellishment of the City-square. It would be seen that their national art collections profited more frequently and liberally by private donation and bequest than by grants from the State, proverbially economical in art matters. It had long been a subject of sad complaint in this country that, owing to the insufficiency of the amount at the disposal of these institutions, they were often obliged, when some great work of art came into the market, to see it pass out of their own reach and go to adorn the galleries of some foreign town. These same difficulties, however, had been felt in other countries, and to meet them associations were formed whose functions were, briefly, the establishment of a fund for the purchase of desirable works of art, thus supplementing the inadequate Government supplies afforded for the purpose. The success of these societies abroad—the Rembrandt Society of Amsterdam, the Kaiser Friedrich Verein of Berlin, and the Société des Amis du Louvre of Paris—had encouraged the "friends" of art in England to form an association on something of the same lines, and the institution of the National Art Collections Fund was the result. This society had a powerful executive committee, and under the chairmanship of Lord Balcarres it was, they hoped, destined to do great things. Deep interest had already been displayed in its initial proceedings, and its birth must be recognised as an important event in the art history of the year 1903. The foundation of another society had also to be noticed—the London Architectural Vigilance Society, under the presidency of Lord Windsor. As its name declares, it proposed to itself the function of protecting æsthetic interests in the treatment of public buildings in London. The report concluded by references to the long list of well-known persons in the world of art who died during the past year.

The Chairman, in moving the adoption of the report, said he might call attention to the fact that during the past year there had been a substantial increase in the number of foreign and colonial members and the subscriptions received through their agency had been a considerable increase upon the previous year. The state of affairs in England had not been favourable to anything in the way of luxury or art, and they, in common with other societies of a similar kind, had felt the depression. At the same time they had not been affected so much as perhaps they might have anticipated. It must be remembered that a Society like that had done much good work in the past and had had a distinct influence on the feeling of Englishmen with regard to art, and after many years of work the field left to cover was not so large. With regard to the picture chosen that year—"The Miller's Meadow"—it might be interesting for them to know that the scene was from the Valley of Lambourne, near Newbury. As they knew, the Canadian subscribers were debarred by the Canadian law from participating in the lotteries, but efforts were being made to get an alteration in the law, which they trusted would be successful.

Mr. Mackrell seconded the motion and the report was adopted.

Lord Windsor was elected President and the Council and officers re-elected.

On the motion of Sir Purdon Clarke, a vote of thanks was passed to Mr. John Sparkes and Mr. T. Buxton Morrison, the Hon. Secretaries.

Votes of thanks were also passed to the Council of the Society of Arts for the use of the room and to the Chairman.

The drawing was then proceeded with for the following prizes:—Painting, "A Surrey Landscape," by J. Clayton Adams; bronze statuette, "Hero," after Miss Margaret Giles; one Marshall vase; twelve Doulton specimen vases; six electro silver inkstands, after Miss K. J. Harris; six sets of framed album mounts in electro silver, after Miss Simpson; six electro bronze statuettes, "Hebe," after Miss Canton; six electro silver bas reliefs, "Descent of Venus," after Mr. Etty, R.A.; six pairs of Doulton vases; twelve pomegranate flower vases; thirty sets of Brandard etchings; and twenty pictures.

RECENT ARCHITECTURE IN BERLIN.

IN noticing the last issue of the *Berliner Architekturwelt* (under the head of "Magazines and Reviews") we mentioned a review of "Berlin Architecture in 1903," by Herr Brüning. It may be of interest to our readers to see something of the views of a German critic on the new architecture of the German capital.

Herr Brüning seems to consider that on the whole German architecture has made progress in the last year. One of the most important changes in this direction was brought about at the Berlin Exhibition of Art. In the competition for designs for an exhibition room, Herr Alfred Balcke was awarded the first premium, but Herr Brüning commends the work of several of the competitors most highly, and also speaks in praise of the exhibition gallery for architects designed by Herr Gessner. Other competitions in which Berlin architects have been successful are:—A college at Freiburg (Herr Heinrich Jennen); schools at Regensburg (Herr Fritz Schwager); the Town Hall at Wilmersdorf (Herr Jansen); and the Town Hall at Lübeck (Herr Otto Kerwien).

Herr Brüning further makes special mention of the Academic Institution for Church Music in Charlottenburg, designed by MM. Anton Adams and Paul Mebes, in a severe Romanesque style, which is in keeping with the character of the Institution. He also notices the church at Münster by Otto Kuhlmann, which, whilst similar in style to other buildings on the Rhine, is yet not a slavish copy of them.

As regards the dwelling houses in Berlin, Herr Brüning considers that the plentiful sprinkling of caryatides, columns and gables, with which so many German buildings are decorated, is gradually being replaced by a more solid form of architecture. In many cases the façade is relieved by a large projection running the whole height of the house and forming the central feature to which the rest of the building is subordinate; this is the case in the houses designed by MM. Paul Engler, Götze and Schraepler, and Schirrmacher and Möller. Of the larger houses may be mentioned the Palace Cohn in Dessau, by Herr Alfred Messel, which is in the form of an important town mansion, and Castle Bartmannshagen, by MM. Erdmann and Spindler, a fine country house.

Herr Brüning notes with approval that the architects of many of these buildings have not been content with designing the exteriors only, but have taken the interior decorations into their own hands, as, for example, B. Bruno Schmitz in his Banqueting House at Mannheim. Others have joined hands with the painters, a combination which cannot fail to have good results on both sides.

THE LONDON COUNTY COUNCIL FIRE BRIGADE.

The London County Council have issued their annual Fire Brigade report. It contains an excellent feature this year in the form of an exceedingly well-drawn map of London with all its Fire Brigade centres and call-points very clearly marked, and the report for this reason alone well merits the study of all interested in fire-protection.

The map shows ninety-seven Brigade centres on land and five river stations. Of the land stations, fifteen are sub-stations and seventy-two are fully-equipped centres, horsed, and ready to turn out in good strength. The map is eminently instructive as to the distribution of the Brigade for the very extensive area it has to protect, but to realise fully the value of this distribution it should be studied with some such map as the large one which was exhibited at the International Fire Exhibition and which shows the distribution of fires for a given year.

It is most curious to note how fires seem to be

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common to special districts, and it would almost appear to us that the distribution of stations does not yet quite accord with the location of the important fire areas. The new station at Limehouse will certainly fill an important gap, but we think that the notorious square mile of the City requires even further stations than it will have upon the completion of the new central district station in Cannon-street. It must be admitted that no public body in any part of the Kingdom or in any other country has done so much good work in the rebuilding and erection of new fire stations as the London County Council, but we certainly think that, if funds permit, there are yet several spots which well merit an extra station, even although this may mean considerable extra annual expenditure for additional staff.

The Brigade has completed its past year under a new chief of the highest credentials and considerable personal popularity, and we trust his tenure in office will be as successful as that of his eminent predecessor, Sir Eyre Massey Shaw, whose great merit it was to accord to the building aspect of fire-protection the important position it holds in connexion with the subject, and to be in the closest touch and sympathy with the architects and surveyors who were interested in better building legislation.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE Annual General Meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, W., Mr. John Slater, Vice-President, in the chair.

Statutory Registration of Architects.

The Chairman, referring to the resolution passed by the Royal Institute on January 4 last—viz., "That a committee, consisting of the Council of the Institute and representatives of the Allied Societies, be appointed to consider the principle of registration and to report thereon to a Special General Meeting," stated that the Committee had been appointed, and had held one meeting—viz., on March 28—at which the following members were present:—Mr. Aston Webb, R.A., President; Messrs. J. Belcher and J. Slater, Vice-Presidents; Mr. Alexander Graham, Hon. Secretary; Messrs. C. E. Bateman, A. W. S. Cross, F. T. Baggallay, E. T. Hall, C. Heathcote, Arnold Mitchell, Beresford Pite, G. H. Fellowes Prynne, W. H. Seth-Smith, John W. Simpson, Leonard Stokes, Members of Council; Messrs. R. S. Balfour, H. V. Lanchester, and Walter Millard, Associate Members of Council; Mr. Henry T. Hare, representing the Architectural Association; and the following representatives of Allied Societies:—Mr. Arthur Clyne (Aberdeen Society), Mr. Arthur S. Parker (Devon and Exeter Society), Messrs. J. T. Cackett and J. Walton Taylor (Northern Association), Mr. Herbert Davis (York Society), Mr. A. Hunter Crawford (Edinburgh Association), Mr. E. M. Gibbs (Sheffield Society), Mr. Howard H. Thomson (Leicester Society), Messrs. G. C. Ashlin, R.H.A., and W. J. Gilliland (R.I.A. Ireland), Mr. H. Dare Bryan (Bristol Society), Mr. A. W. Brewill (Nottingham Society), Mr. Arthur Harrison (Birmingham Association), Mr. J. W. Beaumont (Manchester Society), Mr. H. K. Bromhead (Glasgow Institute). It would be seen, continued the Chairman, that not only had the Council appointed, but they had secured the attendance of a large number of influential men in connexion with the Institute. The matter had been debated at considerable length at the first meeting, and a small sub-committee had been appointed to go into the details of the question and get together the necessary facts, so as to enable the matter to be put before the General Committee. A further meeting had been summoned for May 10, and the whole matter was being thoroughly gone into with a view to reporting to the General Body as to the method of carrying out the proposed registration if it was possible to do so. The Council, concluded the Chairman, had thought it right that the Institute should know what had been done, and had authorised him to make this announcement.

The report of the Council for the official year 1903-1904 was submitted and adopted. The report stated that:—Since the publication of the last annual report the Council have held sixteen meetings, of which the Council elected in June last have held thirteen.

Obituary.—The losses by death have been as follows:—Fellows: Herbert Ford, Charles Fowler, William Warlow Gwyther, Walter Simpson McClelland, Edmund James Martin, William Pain, Percival Gordon Smith, Henry Saxon Snell, Silvanus Trevail, Robert Walker, Nathaniel Young Armstrong Wales. Associates: Arthur Job Barlow, James Martin Brooks, Joseph William Twist. Hon. Associates: Henry William Brewer, William Henry Corfield, Alexander Stuart Murray, Edward Woods. Hon. Corr. Members: Achille Hermant, Valère Dumortier.

It has been decided to award the Medal this year to M. Auguste Choisy, of Paris, Inspector-General in the Service des Ponts et Chaussées, in recognition of his distinguished merits as a writer on architecture. His Majesty the King has signified his approval of the nomination. M. Choisy will come to London to receive the Medal on June 20.

Membership.—The following tabular statement shows the present subscribing membership of the Institute, compared with that at the corresponding periods of the last two years:—

Year.	Fellows.	Associates.	Hon. Associates.	Total.
1902	617	1,071	44	1,732
1903	627	1,117	43	1,787
1904	644	1,142	43	1,829

During the official year since the last Annual General Meeting thirty-seven Fellows have been elected, forty-seven Associates, six Honorary Associates, and five Honorary Corresponding Members. The General Body have approved of a resolution of Council to take steps to alter the by-laws, so that, after December 31, 1906, entrance to the Fellowship shall, except under special circumstances, be confined to Associates or those who have passed the examination qualifying for Associateship. The Council also propose to the General Body an alteration of the by-laws with regard to the proviso to by-law 9.

Form of Contract.—During the official year an agreement between the Institute and the Institute of Builders and the National Federation of the Building Trades Employers of Great Britain and Ireland, with regard to a form of contract, has taken place, and the form now issued bears the endorsement of the three bodies. It is the same, with very slight modifications, as that issued previously by the Institute.

Ancient Lights.—The Ancient Lights Joint Committee have met during the official year, and the Bill, whose title has been changed to the "Easement of Light Bill," is again before Parliament this Session. The thanks of the Council are due to Mr. Fletcher Moulton, K.C., M.P., for introducing and furthering the interests of the Bill.

Building Regulations and By-laws.—The London County Council having requested the Institute to submit amendments to the London Building Act, 1894, for consideration in drafting a new Amendment Bill, the Council entrusted the task to the Art, Practice, and Science Committees, desiring each committee to suggest amendments to those portions of the Act which came within its special sphere of interest. The reports of the three committees were then referred for collation to a special committee appointed by the Council. The amendments as finally drafted by this committee are now under the consideration of the London County Council. The Council have drawn the attention of the Local Government Board to the desirability of uniformity in building by-laws adopted by all the authorities surrounding the Metropolitan boroughs, and of the Board withholding its sanction from proposed by-laws which would prove more onerous than those in the London Building Act. The Council have sent to the Local Government Board, the London County Council, and the London Borough Councils a letter pointing out the unnecessarily drastic character of the new London County Council by-laws as to the deposition of plans with regard to drainage work, and urging simplification.

British Museum Extensions.—The Council have been requested by H.M. Office of Works to assist the Government in obtaining a selection of the best architectural talent available by nominating a limited list of not less than six architects, of taste, skill, and efficiency in classical design, who would be, in their opinion, best qualified to carry out the important work of the proposed extensions to the British Museum.

Southwark Bridge.—The Council have been in communication with the Corporation of London with regard to the association of an architect with their engineer in the erection of the new Southwark Bridge. The Bridge House Estates Committee have requested the President to advise them in obtaining competitive designs for the architectural treatment of the bridge on the structural lines already laid down by their engineer, as soon as the necessary Bill can pass through Parliament. Quite recently, however, difficulties have arisen which may cause considerable delay.

Registration and Education.—On Wednesday, June 24, the President met the Presidents of the Allied Societies in conference on various matters of professional interest. No resolution was moved, but the questions of registration, architectural education, and admission to the Fellowship were discussed, each President being called upon in turn to state his views. It was decided not to publish a report of the proceedings, their great value being the free interchange of opinions between the heads of the London and provincial bodies. On January 4 the question of registration was definitely brought before the notice of the Institute, at a General Business Meeting. Certain motions on the agenda were withdrawn in favour of an amendment providing that the whole question of registration should be referred to a committee consisting of a Council and representatives of the Allied Societies. At their next meeting the Council passed the following resolution:—"Seeing that the Council as at present constituted consist of twenty-four London members and fourteen non-metropolitan members, the Registration Committee be formed by associating with the Council ten additional representatives of the Allied Societies, so that the number of the London and non-metropolitan members of the committee be the same; further, that these ten do consist of one representative from each of the eight Societies not at present represented by their Presidents on the Council, and of one additional representative from each of the two Societies which are numerically strongest in professional members, and which have not two or more of their members at present on the Council." Representatives having been appointed by the various Societies in accordance with this resolution, a preliminary meeting of the Committee was held on Monday, March 28. The Council have appointed a committee consisting of representative architects of the United Kingdom, both members and non-members of the Institute, and of such prominent educationalists as Sir Arthur Rücker, Professor Perry, and Mr. Sidney Webb, to devise a scheme for the co-ordination of architectural education throughout the country. The committee and a sub-committee have met several times, and the Council have received and considered interim reports. As the committee is still sitting, the Council beg leave to defer a fuller report to a future date.

Public Works and Municipal Officials.—The question of County and Municipal Authorities employing their own salaried officials to design and execute important public buildings has received the serious attention of the Council, who have appointed a committee consisting of some of their London members and all the Presidents of Allied Societies to inquire into and suggest remedies for what they cannot but regard as a growing evil. The members of the committee and various architects in the provinces have supplied the committee with valuable information in writing as to facts bearing on the question which have come within their own experience, and various Honorary Foreign Correspondents and Architectural Societies abroad have also been kind enough to provide the committee with interesting statements as to the position of affairs in their respective countries. The collation of the large mass of information received is now being proceeded with, and the committee hope to submit their report to the Council before the end of the session.

Standardisation of Materials, etc.—The Council have approved the standard size of bricks recommended by the Science Committee, after some years of negotiation and conferences with representatives of the Institution of Civil Engineers and the Brickmakers' Associations. A copy of the standard, to be known as "The R.I.B.A. Standard Size of Bricks," has been sent to all the brickmakers in the kingdom, and the Council have issued a request that members should insert the standard sizes in their specifications. The makers of glazed bricks have also had their attention drawn

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to the standard. The Chairman of the Science Committee has been appointed by the Council to represent the Institute on the Sub-Committee on Cement of the Engineering Standardisation Committee. The report of brickwork tests is now being printed, and will be issued in volume form as soon as it is ready. The Council have appointed Messrs. Thomas Blashill, W. D. Caröe, and H. D. Searles-Wood to represent the Institute on a Committee of the Plumbers' Company, the Water Authorities, and the Royal Institute of British Architects, to inquire into the waste of water and the question of plumbers' fittings in water supply.

Liverpool University.—Sir William Emerson, Past-President, on the recommendation of the Council, has been appointed a member of the Court of the Victoria University, Liverpool.

Congresses and Public Committees, etc.—Mr. John Slater attended as the Institute representative at the International Congress of Hygiene and Demography held in Brussels on September 7 last year. The following have been appointed to represent the Institute at the Sanitary Institute Congress to be held in Glasgow in July:—Messrs. J. J. Burnet, A.R.S.A., E. T. Hall, Thos. W. Cutler, and Mr. John Keppie, President of the Glasgow Institute of Architects. Messrs. T. E. Collcutt, T. W. Cutler, and the Secretary were appointed by the Council as the Institute delegates to the Sixth International Congress of Architects, held at Madrid from April 6 to 13. Messrs. John Slater, J. W. Simpson, and the Secretary were appointed by the Council to represent the Institute on a Consultative Committee, authorised by the Board of Education, and assembled for the purpose of inquiry into the possibility of instituting a leaving examination from secondary schools throughout the country, which might stand in lieu of the preliminary examinations required by the various professional bodies. The committee has not yet issued its report.

Portraits, Memorials, etc.—Mr. H. H. Statham has been appointed by the Council to represent the Institute on a committee formed under the auspices of the Hellenic Society to effect the erection at Athens of a memorial to the late Mr. F. C. Penrose. The Institute Memorial to Mr. Penrose has been placed in the crypt of St. Paul's Cathedral, and will shortly be unveiled. The Institute portrait of Sir William Emerson, Past-President, by Mr. J. J. Shannon, A.R.A., will be exhibited this summer at the Royal Academy.

Competitions.—Various changes in the "Suggestions" proposed by the Competitions Committee and approved by the Council were adopted by the General Body at the General Meeting of February 29. The Council have decided to send a circular letter to every member of the Institute in respect of any competition concerning which the Competitions Committee consider that such a course is desirable, requesting him not to compete. As an instance of the difficulty of awakening in the lay mind an appreciation of the value of correct dealing in the matter of competitions, the Council would report that, in view of the various unsatisfactory competitions for Carnegie Libraries, they wrote to Mr. Andrew Carnegie suggesting that he should insert in his future deeds of gift a condition that, if the beneficiaries contemplated instituting a competition for the proposed building, such competition should be conducted according to the Institute's "Suggestions," and were met by that gentleman with a curt refusal.

Government Buildings.—At the opening meeting of the session Lord Windsor, First Commissioner of Works, spoke encouragingly as to the possibility of forming an Advisory Committee to whom the architectural considerations involved in large building schemes might be referred by the Government. The Council have written to Lord Windsor a formal letter asking him to lay before His Majesty's Government their request that such a committee should be appointed. The Council understand that for some time past a committee, consisting of the President, Sir John Taylor, K.C.B., and Mr. John Belcher, A.R.A., has been requested by the Office of Works to advise them from time to time on various buildings of public importance.

Miscellaneous.—The Council are glad to be able to report that the Institute continues to enjoy financial prosperity. The balance of income over expenditure is 918*l.* 11s. 4d., after the payment of a grant of 500*l.* to the Architectural Association Building Fund. The Council have accepted an invitation from the Society of Designers that the President for the time being of the Institute should be an Honorary Member of the Society. The Council have subscribed 5*l.* to a memorial in Brussels to the late M. Valère Dumortier, one of the founders of the Société Centrale d'Architecture de Belgique. During the official year a telephone (P.O. 434 Mayfair) has been fixed in the clerks' office, for the use of the office and of members and a telegraphic address ("Ribazo, London") has been registered at the General Post Office.

In concluding the report the Council feel that the thanks of the Institute are due to the Standing Committees, the Competitions Committee, and to the Allied Societies and their representatives for the specially valuable assistance they have rendered the Institute during the past year.

The Art Standing Committee.—At the first meeting of the committee Mr. Macvicar Anderson was elected Chairman; Sir Wm. Emerson, Vice-Chairman; and Messrs. J. S. Gibson and W. D. Caröe, Hon. Secretaries. The committee has met four times, and the following subjects have received consideration:—Tintern Abbey, London Suburban Building By-laws, Lambeth Bridge (proposed rebuilding), Southwark Bridge, Berwick-upon-Tweed Bridge, Peterborough Market Hall, London Building Acts (Amendment) Bill, Advertisement Abuse on Buildings, London Traffic Commission, the Wooden Pediment and Dome of Somerset House. It will be seen that the question of bridge design has again occupied a considerable amount of the committee's deliberations, and it has to express regret that this is owing both to the callousness of authorities in regard to ancient structures in their keeping, and to the general inability of the public to appreciate the fact that the construction of bridges, especially across great waterways, affords fine architectural opportunities. The committee, in calling attention to the fact that the Lambeth Bridge rebuilding scheme is at a standstill, would take the opportunity of pointing out that nothing should be left undone to keep alive the architectural importance of this projected structure. It is satisfactory to record that the Corporation of the City of London has realised its responsibility in regard to Southwark Bridge, by appointing the President R.I.B.A. as one of the assessors in the proposed limited competition of architects and engineers for designs; thereby recognising that the æsthetic considerations involved are material to the community. At Berwick-upon-Tweed some progress, on the lines urged by this committee, has been made, and it is gratifying to record a hope that an historical and interesting ancient bridge will thus receive proper treatment.

The Literature Standing Committee.—Since the election of the present committee in June, 1903, the Literature Committee have held eight meetings. At the first meeting Mr. R. Phené Spiers was re-appointed Chairman; Mr. H. Heathcote Statham, Vice-Chairman; Messrs. Leslie Waterhouse and A. Maryon Watson were appointed Hon. Secretaries. The committee have to deplore the loss of one of their most distinguished members, Dr. Alexander Stuart Murray, Keeper of Greek and Roman Antiquities at the British Museum, and a classical archæologist of European repute. Dr. Murray has not only enriched the proceedings of the Institute with many scholarly contributions, but by his frequent attendance at the deliberations of this committee he has also rendered services whose value will not soon be forgotten.

The Practice Standing Committee.—The usual monthly meetings have been held, with one exception, and, in addition, three special meetings and ten sub-committee meetings for consideration of the London Building Acts (Amendment) Bill, 1904. All the meetings have been well attended. The following officers were elected at the commencement of the session:—Mr. J. Douglass Mathews, Chairman; Mr. A. H. Kersey, Vice-Chairman; Mr. C. H. Brodie and Mr. E. Greenop, Hon. Secretaries. It was with deep regret that the committee found that Mr. S. Flint Clarkson's health would not allow of his continuing to take further part in the work of the committee. The greater part of the time of the committee during the session has been occupied by the consideration in detail of the present London Building Act, 1894, with a view to suggesting amendments thereto, upon the invitation of the London County Council, for their consideration in the preparation of an amended Act for submission to Parliament. Much labour was involved in this, and, in addition to the ordinary meetings, three special meetings and ten sub-committee meetings were, as already mentioned, held. At the instigation of the committee a circular was sent to all the members of the Institute inviting suggestions for the amendment of the present Act. A large number of replies were received and considered by the committee. The committee reported very fully to the Institute Council, who then referred the whole matter to a special committee, consisting of the Chairmen of the Art, Practice, and Science Committees, with two members of the Council. The final report of this special committee was sent to the London County Council from the Council of the Institute. An expression of the views of the Institute upon the draft "By-laws of the Corporation of the City of London relating to the Demolition of Buildings" having been invited by the Corporation, the matter was referred by the Council to the committee. The proposed by-laws were considered in detail and a report made. As the result of the recommendations in the report, and their support by the Chairman (Mr. Douglass Mathews) in the Corporation, some valuable amendments were secured As, however, the Corporation declined to give way upon certain items which, it was considered, imposed, as they stood, unnecessary and costly restrictions upon building operations in the City, the committee recommended the Council to forward their objections to the Local Government Board. This course was adopted. The Institute of Builders having expressed to the Council their desire to confer with the Institute in this matter, a deputation from that body was received by the Practice Committee, and expressed their agreement with the proposed amendments. Two objections to the Institute scale of charges were raised by two members of the Institute, and suggestions were made that the schedule should be amended. The committee fully considered the points raised, and decided that it was not advisable to again alter a schedule which had so recently been revised, more especially as the two cases brought to their notice could only under exceptional circumstances involve any hardship or difficulty.

The Science Standing Committee.—The Science Committee have held nine meetings, with an average attendance of eleven, since the publication of the last report. Mr. Lewis Solomon was appointed Chairman; Mr. Max Clarke, Vice-Chairman; and Mr. H. D. Searles-Wood and Mr. Bernard Dicksee, Hon. Secretaries. The report on the brickwork tests is in print and will be shortly published. The R.I.B.A. standard size of bricks has been finally agreed to, and comes into force on May 1, 1904. The committee, at the request of the brickmakers, are now endeavouring to standardise glazed bricks in harmony with the Institute standard. The Chairman has attended the meetings of the Joint Standard Committees which have standardised the rolled joint sections; the Chairman is a member of the Joint Committee which is now engaged in standardising the specifications and tests for Portland cement. At the request of the Fire Offices Committee they have under consideration the regulation relating to fire-resisting building with a view to making suggestions that may make these rules more useful. The committee reported to the Council on the amendments to the London Building Act; and their draft by-laws for skeleton buildings and supports under superstructures have been forwarded to the London County Council.

The Council were authorised to elect scrutineers, the majority of whom shall be Fellows, for the annual election of the Council and the standing committees.

Messrs. Sydney Perks and H. A. Crouch were nominated as auditors for the ensuing year of office. A vote of thanks was passed to Messrs. Louis Ambler and W. A. Forsyth, last year's auditors.

The existing Statutory Board of Examiners under the London Building Act, 1894, and other Acts of Parliament was re-appointed for the ensuing year of office.

The meeting then terminated

TRAMWAYS AND LIGHT RAILWAYS ASSOCIATION.—The meeting called for Friday, May 6, 1904, at the Society of Arts, has been postponed to a later date, of which due notice will be given by the Secretary.

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THE SURVEYORS' INSTITUTION:

PROFESSIONAL EXAMINATIONS, 1904.

The following student candidates have passed the examination for the Professional Associateship:—

H. A. Adams, Hampstead, N.W.; H. C. Allen, West Hampstead, N.W.; R. S. Andrews, Wolvercote, Oxford; P. M. Ashbridge, Wanstead, N.E.; D. F. Aynsley, Gosforth, Newcastle-on-Tyne; F. L. Baker, Thorley, near Bishop's Stortford; S. F. Barton, Walthamstow, E.; R. L. J. Bedford, Acton, W.; B. Blackbourn, Upper Tooting, S.W.; V. H. Blessley, West Hampstead, N.W.; H. C. Boden, Putney, S.W.; W. E. Brown, Chester; H. Burch, Highgate, N.; F. M. Burr, Hornsey Rise, N.; C. M. Chaplin, Saxmundham; J. G. Chapple, Chiswick, W.; *W. C. Clemens, Plymouth; A. I. Clemesha, Chiswick, W.; A. H. Corble, Waltham Abbey; E. H. Dean, Westminster, S.W.; F. E. Dixon, Ryde, Isle of Wight; S. Edwards, Exeter; F. R. Elloart, London; G. W. Ferris, Maida Hill, W.; G. F. Finch, Crouch End, N.; S. J. Fox, Crouch Hill, N.; A. S. France, Streatham Hill, S.W.; H. J. Gale, Benson, Oxfordshire; G. S. Gotelee, Croydon; E. L. Gruning, East Witton, Middleham, R.S.O., Yorks; V. M. Hall, Hampstead, N.W.; C. P. Harrington, Clapham Park, S.W.; E. T. Haslehust, Weybridge; R. W. Hawke, New Barnet; J. Hayward, Bath; L. Hobbs, Kelmscott; Lechlade; F. V. Hobson, London; R. L. Honey, Rochester; S. Hooper, Hornchurch; J. N. Horsfield, jun., Kingston-upon-Thames, S.W.; R. W. McL. Keay, Crouch End, N.; W. H. Lamble, Acton, W.; J. R. McDonald, Southall; G. A. Minter, Faversham; T. H. Moore, Tewkesbury; J. S. Naylor, Beckenham; A. O. Noakes, Willesden Green, N.W.; †C. F. Norman, London; B. C. Page, Clapham, S.W.; R. Page, Camden Town, N.W.; H. Page, Barnet; J. O. Payne, Bromley; F. C. Pearson, Morecambe, Lancashire; C. W. Perry, London; A. P. Pickersgill, Putney Hill, S.W.; A. B. Pritchard, Highbury, N.; T. W. Punchard, Kirkby Lonsdale; D. A. Rawlence, Salisbury; H. W. Redfern, Hampstead, N.W.; B. L. Rice, Watford; F. W. Rivers, Wandsworth Common, S.W.; P. H. Ross, Holloway, N.; H. E. Sherwin, Wandsworth Common, S. W.; F. M. Skelt, Leytonstone, N.E.; L. J. Small, Broadstairs; R. B. Stephenson, Darlington; H. T. Tate, Gargrave, *vid* Leeds; C. A. S. Vardy, Maidenhead; M. H. Vickerman, Wembley; J. L. H. Vivian, Wandsworth Common, S.W.; P. D. Voisey, Exeter; H. West, Ryde; R. S. White, Cambridge House, near Stonehouse; J. B. Williams, St. Helens; H. Wood, Great Grimsby; E. E. Woodbridge, Harrow; J. P. Woodhams, Hastings; B. Worrall, Whalley Range; E. H. Wright; Plumstead, S.E.

Scottish Candidate.—A. K. Foulis, Motherwell, N.B.

The following Non-Student Candidates have also passed the examination for the Professional Associateship:—

A. H. Abbott, Boscombe; H. J. Ash, Stamford; S. Balster, Woolwich, S.E.; H. J. Barber, Andover; G. W. Barnham, Watton; C. F. Bartholomew, Plumstead, S.E.; O. G. Bates, Croydon; H. Bellamy, York; A. F. Benjamin, London; P. J. Bevington, Canonbury, N.; J. W. B. Blackman, Brighton; J. W. Blair, Nuneaton; A. E. Blake, Trowbridge; L. Blanc, Earl's Court, S.W.; P. E. Boddington, Willesden Green, N.W.; E. B. Bowen, London; F. A. Boyton, Old Fulham, S.W.; J. Bray, Guildford; J. C. Brooke, Barking; G. F. Burton, Radcliffe, near Manchester; A. Chambers, Beckenham; R. L. Charteris, Attleborough; R. Chew, South Kensington, S.W.; A. H. Clarke, Walthamstow; W. H. C. Clay, Derby; C. C. Commander, Walthamstow; T. Cook, Clapham Common, S.W.; C. F. A. Cooper, Rugby; G. F. Cotching, Horsham; A. S. Cox, Ealing, W.; H. R. Crabb, London; W. St. L. Crowley, Cardiff; H. W. Cubitt, London; F. S. Cutler, Hounslow; W. J. Dacombe, Bournemouth East; R. T. Dadson, Harrow-on-the-Hill; G. C. Davenport, Headington Hill, Oxford; J. Davey, Old Charlton; J. N. Davies, London; W. E. Denham, Tottenham, N.; W. Dewe, Henley-on-Thames; E. H. Dodgson, Stevenage; R. C. Duttson, Sydenham, S.E.; W. A. D. Edwardes, Sutton; J. P. Edwards, Peckham, S.E.; J. Ellis, Pantybarwn, Llangwyryfon; G. F. Ellyatt, Camberwell, S.E.; C. E. A. Ermen, St. Tudy, R.S.O.; H. Ermrich, Croydon; B. Everard, London; C. H. Eyles, Kensington, W.; H. J. Fagan, Clapham, S.W.; C. H. Farthing, Southsea; E. W. Farwell, Bath; H. E. Fitzherbert, Downton; F. G. Gee, Norwich; E. M. Gilbert-Lodge, Chiswick, W.; E. B. Glasier, Wimbledon Park, S.W.; R. F. Graham, London; W. Greenwood, Blackburn; S. J. Halse, Fulham, S.W.; C. R. Harding, East Grinstead; J. F. S. Hards, Westminster, S.W.; F. J. Harrington, London; J. J. Hazlett, Kildare; R. C. Heard, Bridgwater; F. J. Henson, Tonbridge; E. Highway, Cirencester; W. W. Hodges, Croydon; L. S. Hoggarth, Kendal; D. C. Hogwood, Ramsgate; W. J. Holloway, Dunmow; E. G. Houghton, Woodford Wells; E. G. Huggins, Highbury, N.; O. W. Hunt, Richmond, Yorkshire; H. D. Hunter, Buckenham; T. L. Hustler, Stoke Newington, N.; F. N. Hutton, Finsbury Park, N.; A. Inskipp, Harlesden, N.W.; W. L. Jenkins, London; G. N. Kingsford, Wye; J. Lees, Hale, Altrincham; H. W. Line, London; R. W. Lines, Tring; A. H. Llewellyn, London; ||§ G. T. Loban, Streatham Common, S.W.; W. M. Lynde, Balham, S.W.; E. C. McConnel, Downton; J. W. McKerrow, Newcastle-on-Tyne; T. F. Main, Budle, Bamburgh, R.S.O.; F. S. Mason, Putney, S.W.; B. S. Mayhead, Lavender Hill, S.W.; J. F. S. Mellor, Lytham; E. H. G. Miller, Old Malden, Worcester Park; G. F. Miller, Alexandra Park, Manchester; A. E. Mirams, Alexandra Park, N.; S. Mitchell, Leicester; C. Moiser, York; W. S. Newbery, Battle; W. W. Newman, Loughborough; E. G. Nye, Guildford; C. N. Palmer, Ealing, W.; W. L. F. Palmer, Knowle, Bristol; W. H. Parker, Stanmore; H. B. Paxon, London; G. S. Perkins, Teddington; F. N. Pilbeam, Kensington Park, W.; J. M. Pilkington, Cricklewood, N.W.; R. R. Power, Clapham Road, S.W.; T. F. V. Prickard, Dderw, Rhayader; C. D. Quarmby, Blackheath, S.E.; B. P. Riddett, Ryde, Isle of Wight; H. Rippon, Tufnell Park, N.; E. L. Roberts, Sheffield; L. N. Rogers, Putney Hill, S.W.; M. S. Rogers, Putney Hill, S.W.; J. W. Roper, Tonbridge; F. W. Rowe, Rainbow Hill, Worcester; T. Rule, Aspatria; E. Russ, St. John's Wood, N.W.; E. S. Ruthen, Routh, Cardiff; J. Ryan, London; F. E. Sargant, Balham, S.W.; A. P. Saunders, Ealing, W.; H. N. Savill, Broxbourne; J. C. Scott, Grantham; L. C. Sharma, Gray's Inn, W.C.; A. G. Sladdin, Brighouse; A. W. Slatter, Hereford; E. E. Smith, Dartford; ‡H. R. Smith, Warnham; G. W. S. Sparrow, Albrighton Hall, near Shrewsbury; J. C. Spensley, Hampstead, N.W.; H. E. Steeds, Birmingham; C. J. Strachan, Belsize Park, N.W.; J. W. Tait, Bangor; H. E. Tasman, West Hampstead, N.W.; H. W. Taylor, Clapham Common, S.W.; T. O. Taylor, Muswell Hill, N.; A. Temple, Streatham, S.W.; H. D. Thomson, Hammersmith, W.; G. E. Thurman, Upper Holloway, N.; A. M. Thwaites, Hornsey, N.; G. P. Thwaites, Hornsey, N.; H. J. Titford, Edenbridge; M. Tobias, London; L. E. Todd, Hawarden, Chester; E. A. Toley, East Acton, W.; R. E. Turnbull, Bothal, Morpeth; J. Voyce, Manchester; J. G. Walker, Spring Gardens; B. H. Waller, Southampton; F. W. Walsh, Kilburn, N.W.; W. D. Walters, Tonypandy; B. E. Waterman, Dartford; E. Watson, St. Paul's Cray; J. K. Waymouth, Crouch Hill, N.; A. D. M. Webber, Bryn Bellan, Mold; W. H. Webber, London; W. Wheeler, Notting Hill, W.; S. D. Whiddington, Crouch End, N.; E. B. Whitley, Camden Square, N.W.; L. S. Whittingham, Powis Castle, Welshpool; A. D. Williams, Ramsgate; G. L. Wilson, Wandsworth Common, S.W.; D. Wood, Clifton Hill, N.W.; S. E. Wood, Canonbury, N.; C. E. Young, Barking.

Scottish Candidates.—R. F. Brebner, Falkirk; J. S. J. McCall, Kelvinside, Glasgow; J. L. Thompson, Edinburgh.

The following Professional Associates have passed the Fellowship Examination:—

W. B. Aubrey, Thame; F. H. Austin, London; R. H. Barclay, Clapham, S.W.; H. B. Beddall, Kettering; H. W. Binns, Richmond, Surrey; F. G. Bliss, London; E. W. Booth, Croydon; B. A. Boyton, Fulham, S.W.; H. C. Bradshaw, Rotherwick, Winchfield; T. Brent, Redhill; J. Burnett, Gopsall, Atherstone; C. F. Burroughes, Leicester; W. E. Candy, Encombe, Wareham; T. L. Caton, Brixton, S.W.; A. W. Champernowne, Sidbury, Sidmouth; J. Chandler, Finchley, N.; C. V. Chilwell, Hyde Park, W.; H. O. Clark, London; J. H. Coles, Barnet; H. T. Cooper, Portman-square, W.; P. Crabtree, Leigh; J. L. Crouch, London; C. H. Donne, Leek Wootton; E. G. Drower, Westminster, S.W.; M. C. Ducheane, Farnham Common, Slough; F. B. Dyer, Lewes; G. P. Elphick, Chester; E. W. Fagg, Kensington, W.; C. J. Fowler, Clapham Common, S.W.; C. G. French, East Finchley, N.; H. F. Funnell, Camberwell, S.E.; A. Gimson, Pinner; P. F. Gleed, London; R. H. Goodchild, Norwich; H. N. Gray, London; O. Griffiths, Covent Garden, W.C.; J. T. C. Hazledine, Burlton Hall, near Shrewsbury; F. S. Henniker, Balham, S.W.; W. D. Heskett, Penrith; P. W. Home, Finsbury Park, N.; H. How, London; E. Howard, Barnet; A. W. Hudson, Stoke Newington, N.; R. S. Jackson, Sittingbourne; H. H. James, South Kensington, S.W.; R. C. Jonas, London; J. R. Jones, Stroud Green, N.; R. C. Jull, Tunbridge Wells; W. H. Keep, Covent Garden, W.C.; H. J. T. Kibblewhite, Mildmay Park, N.; F. C. Knibb, Clapham Common, S.W.; ℔G. P. Knowles, London; G. A. Lambert, Wood Stanway, Winchcombe, R.S.O.; A. R. S. Leaning, Brixton, S.W.; L. Lickis, Clapham Common, S.W.; W. J. Luffingham, Spring Gardens, S.W.; W. V. Lush, Wembley, R.S.O.; M. L. Lyon, Fulham, S.W.; S. Mager, Hughenden; L. Maggs, Gunnersbury, W.; T. E. Marks, Leeds; H. W. Mason, Barnes, S.W.; E. L. Moore, Muswell Hill, N.; I. C. Morrison, St. Albans; J. N. Neill, Leeds; ** F. G. Newnham, South Norwood, S.E.; L. R. Notley, London; J. Nutter, Morecambe, Lancashire; F. H. G. Osmond-Smith, East Grinstead; F. C. R. Palmer, Westminster; S. Parkhouse, St. Quintin Park, W.; A. E. Parry, Balham, S.W.; T. W. Pearse, Modbury, South Devon; G. F. J. Peters, Ashstead; C. N. Philpot, Dunsmore, Warlingham; S. L. Porter, Mayfield, Hutton; F. C. J. Read, New Cross, S.E.; M. C. Riddett, Charlbury; A. H. Rippingal, Thornton Heath, Surrey; G. W. Ruddle, Greenwich, S.E.; J. H. Salmon, Streatham Hill, S.W.; J. A. Sawyer, Winchester; J. Scott, Putney, S.W.; W. Smalley, Euston-square, N.W.; C. P. Smith, Greenwich, S.E.; H. Smith, Chelmsford; Q. C. Smith, Lincoln's Inn Fields; S. A. Smith, Monkseaton; F. E. Spalding, Hampstead, N.W.; H. S. Stewart, Wimbledon Park, S.W.; F. Stone, Newcastle, Staffordshire; J. Stooke, Hereford; J. J. Strutt, Witham; P. J. Symmons, Harrow; F. J. Tallboy, Ilford, Essex; E. T. Taylor, Ansdell, near Lytham; J. J. Taylor, Norbury, S.W.; A. Timbrell, St. Albans; W. Tomlin, jun., Andover; E. Underwood, Earl's Court, S.W.; L. J. Veit, Pimlico, S.W.; A. L. Watt, Figheldean, Salisbury; A. H. Wells, Ashby-de-la-Zouch; B. W. White, London; H. W. Whitton, Caswell, Towcester; ††C. E. Widdicombe, Ryde, Isle of Wight; J. F. Wilkes, Saffron Walden; J. G. Wood, London; C. L. Wright, Bristol.

The following candidates have passed the Direct Fellowship Examination:—

A. Briggs, Manchester; N. Chennells, St. Leonards; F. W. Cook, Addiscombe; A. D. Fenton, Roborough; C. M. Maltby, London; G. A. Ovitts, West Ham, E.; J. S. Rimmer, Liverpool; F. Weston, London.

Scottish Candidate.—J. S. Paterson, Cummertrees, Annan, N.B.

* Institution Prize. † Special Prize.
§ Penfold Silver Medal. || Driver Prize.

‡ Beadel Prize. ℔ Galsworthy Prize.
** Crawter Prize. †† Penfold Gold Medal.

ST. PAUL'S CATHEDRAL.—It is announced that the Wellington Chapel in St. Paul's is to be adapted for use as the chapel of the Order of St. Michael and St. George. That order consists of members who have rendered distinguished services in the Crown colonies, or in matters connected with our colonial administration. The chapel, at the west end of the south aisle, takes its name from having been the place wherein Stevens's monument to the Duke of Wellington was first erected. Since the recent removal of the monument into the nave, the chapel has been used for sittings of the Consistory Court of London; it will now be refitted with the knights' stalls, banners, etc., under the superintendence of Mr. Somers Clarke, architect and surveyor to the cathedral.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 3,081*l.* for various purposes and Hammersmith Borough Council 3,918*l.* for street improvement; sanction was also given to Bermondsey Borough Council to borrow 33,400*l.* and 10,000*l.* for erection of working-class dwellings.

Extension of Hampstead Heath.—The Parks Committee recommended that the Council contribute 8,000*l.* towards the purchase of 80 acres of land, situated adjoining the North-western boundary of Hampstead Heath.

Mr. Bridgman moved, and Colonel Rotton seconded, an Amendment to the effect that further expenditure in this direction was not justified, and that the recommendation be referred back to the Committee.

The Amendment was defeated and the recommendation agreed to.

Main Drainage Extension.—The Main Drainage Committee recommended that an advertisement be issued inviting tenders for the construction, in accordance with the plans prepared by the Engineer, of a portion of the two additional lines of outfall sewers between the Abbey-mills pumping-station and the Barking outfall works, such portion to commence at a point about 350 ft. east of East Ham manorway and to extend to the west side of the precipitation channels at the Barking outfall works.

An amendment was moved and adopted to refer the matter to the Works Committee.

Golder's Hill.—The Parks and Open Spaces Committee recommended that the estimate of 762*l.*, submitted by the Finance Committee, be approved; and that expenditure not exceeding that amount be authorised for the work of adaptation of part of the mansion at Golder's Hill as conveniences, and as a residence for the superintendent; and that tenders be invited for carrying out the works.

On the motion of Sir W. Collins, seconded by Mr. Jephson, the recommendation was referred back to the Committee.

Theatres.—The Theatres and Music Halls Committee stated that they had considered plans, submitted by Messrs. F. Matcham and Co., of a theatre proposed to be erected at the junction of Coventry-Street and Rupert-street. The plans show seating accommodation for 712 persons. They also reported that they had considered plans, submitted by Messrs. Owen and Ward (for Mr. C. Sounes), of a theatre proposed to be erected at the junction of East India Dock-road and Stainsby-road, Poplar. The plans show seating accommodation for 1844 persons. The applications were granted on certain conditions.

District Surveyors' Districts Map.—The Building Act Committee reported that in October, 1901, they gave instructions for the preparation of a map showing the areas of district surveyors' districts, and of the metropolitan boroughs. Estimates were obtained for the supply of 1,000 copies of the map, and the lowest estimate being that of Messrs. Phillips and Co., who agreed to carry out the work for 50*l.*, the order was given to that firm. Owing to the number of new appointments of district surveyors and the alterations that have been made in the districts, the issue of the map has been delayed, and the cost of production increased by 5*l.*, so that it had become necessary for them to obtain sanction to the expenditure. The copies had now been delivered and were on sale.

General Line of Buildings on South Side of Fulham-road, Westward of Munster-road.—They also recommended and it was agreed, that the solicitor do take all necessary steps to obtain the decision of the High Court upon the case stated by the Tribunal of Appeal, constituted under the London Building Act, 1894, in the matter of their order as to the general line of buildings on the south side of Fulham-road, westward of Munster-road.

Carr's Restaurant, Holborn to Strand.—The Improvements Committee recommended and it was agreed, that the payment of 763*l.* 6s. 5d. to Mr. George Cox, in respect of the additional expense incurred by him in rebuilding a portion of Carr's restaurant in Portland stone as required by the Council, instead of in terra-cotta, be approved, and that the matter be referred to the Finance Committee to complete.

The Council adjourned at 7.30 p.m.

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APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontages and Projections.

Lewisham.—Three buildings on a site abutting upon the west side of Church-road and north side of South-road, Lewisham (Mr. J. M. Kennard for Mr. E. C. Christmas).—Consent.

Hackney, Central.—One-story shops upon part of the forecourts of Nos. 263, 265, 267 and 269, Mare-street, Hackney, with the northernmost shop to abut also upon Richmond-road (Messrs. Hodson and Whitehead for Messrs. Hodson and Co.).—Consent.

Westminster.†—A one-story addition to the existing porch at the flank of No. 1, Montpelier-square, Knightsbridge (Mr. A. Williams for Mr. C. D. Harrod).—Consent.

Hammersmith.—A one-story shop upon part of the forecourt of No. 358, King-street, Hammersmith (Mr. E. Richardson).—Consent.

Lewisham.†—Houses on the west side of Mayow-road, Sydenham, southward of the Sydenham recreation ground (Messrs. J. Edmonson and Son).—Consent.

Finsbury, Central.†—Re-erection of one-story buildings upon the forecourts of Nos. 184 and 186, Pentonville-road, Clerkenwell (Messrs. Bertram, Parkes and Knight for Messrs. A. and H. Knight).—Refused.

St. Pancras, South.—Buildings upon the site of Nos. 45 to 113 (odd numbers), inclusive, Euston-road, St. Pancras (Mr. W. C. Jones for the Worshipful Company of Skinners).—Refused.

St. Pancras, South.—Buildings upon the site of Nos. 23 to 35 (odd numbers), inclusive, Euston-road, St. Pancras (Messrs. Parr and Sons for Mr. W. F. Howard-Flanders).—Refused.

Marylebone, West.—A building on the site of Nos. 257 to 265 (odd numbers only), inclusive, Marylebone-road, St. Marylebone (Mr. L. Stokes for the National Telephone Company).—Refused.

Wandsworth (detached).—One-story shops on the part of the forecourts of six houses on the north side of Rosendale-road, Herne-hill, between No. 1, Park-villas and Guernsey-grove (Mr. P. C. Davies for Messrs. R. Parry, H. Eaborne, and F. J. Chapman).—Refused.

Width of Way.

Hampstead.†—A building on a site abutting upon Streatley-place, Murray-terrace and Newend, Hampstead, with a forecourt fence at less than the prescribed distance from the centre of the roadway of Streatley-place (Mr. W. S. Cooke for the School Board for London).—Consent.

Marylebone, West.—Rebuilding of Nos. 4 and 5, Cumberland-mews, Edgware-road, St. Marylebone (Messrs. Hudson and Hunt for the Church Army).—Consent.

Width of Way and Lines of Frontage.

Hammersmith.—The retention of a wooden shed at the rear of No. 103, Askew-road, Hammersmith, with the external walls at less than the prescribed distance from the centre of the roadway of Landor-road (Mr. W. Smith).—Consent.

Fulham.—A urinal at the rear of the Imperial beer-house, Sands-end-lane, Fulham, to abut upon Stanley-road (Messrs. W. D. Church and Son for Mrs. E. Wilson).—Consent.

Wandsworth.—New tramcar sheds on a site on the west side of Jews-row, Wandsworth, abutting also upon Marl-street and Churchwalk, with external walls at less than the prescribed distance from the centre of the roadway of Church-walk (Mr. E. J. Edwards for the Highways Committee of the Council).—Consent.

Islington, East.—A building at the rear of No. 121, Ball's-pond-road, Hackney, to abut upon Culford-road (Messrs. Weibking and Co. for Mr. J. Schofield).—Refused.

Line of Frontage and Space at Rear.

Kensington, South.—A deviation from the plans approved on for the erection of residential flats on the site of Nos. 34 to 44 (even numbers only), inclusive, Abingdon-villas, to abut also upon Allen-street, Kensington, so far as relates to an increase in the height of the rear parapet of the building, and also the erection of an angle turret at the first, second, third, and fourth floor levels of such building (Mr. S. Newcombe for Mr. W. J. Blow).—Consent.

Space at Rear.

Southwark, West.—A modification of the provisions of section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of an addition at the rear of No. 176, Blackfriars-road, Southwark, and extending also at the rear of No. 177 (Mr. A. C. Russell for the Sons of Temperance Friendly Benefit Society).—Consent.

Formation of Streets.

Woolwich.—A deviation from the plans sanctioned for the formation of new streets upon the Eltham-park estate, High-street, Eltham, so far as relates to the formation of Glenesk-road, Berry-hill-road, Elibank-road, and Crookston-road, Eltham (Mr. R. Stewart for Mr. A. Cameron Corbett, M.P.).—Consent.

Poplar.—That the Council do accede to the request of Mr. F. E. Duckham for the Millwall Dock Company, for permission to abandon the formation of new streets, approved on June 16, 1882.—Agreed.

Deviation from Certified Plans.

Holborn.—Certain deviations from the plans certified by the district surveyor, under section 43 of the Act, so far as relates to the re-erection of No. 16, Ormond-yard, Queen's-square, Holborn (Mr. T. Wilson for Mr. W. C. Gidden).—Consent.

Dwelling houses on Low-lying Land.

Greenwich.—That a licence be granted to the Delta Metal Company, Ltd., for the erection of foremen's cottages, manager's house, office, etc., on low-lying land situated at the proposed works of the company in Blackwall-lane, East Greenwich.—Agreed.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—At the annual general meeting of the members of this Society, held on the 28th ult., the following officers and members of Council were elected:—President, Mr. J. W. Beaumont, F.R.I.B.A.; Vice-presidents, Messrs. W. A. Royle, F.R.I.B.A., and John Eaton, C.B., F.R.I.B.A.; Hon. Secretary and Treasurer, Mr. Paul Ogden, F.R.I.B.A.; Assistant Hon. Secretary, George Brown. Members of Council: Fellows, Messrs. S. H. Capper, M.A., A.R.I.B.A., R.C.A., John Ely, F.R.I.B.A., Edward Hewitt, F.R.I.B.A., Jesse Horsfall, F.R.I.B.A., A. H. Mills, A.R.I.B.A., J. D. Mould, F.R.I.B.A., Isaac Taylor, John H. Woodhouse, F.R.I.B.A., and P. S. Worthington, M.A., A.R.I.B.A.; Associates, Messrs. A. E. Corbett, A.R.I.B.A., J. H. Gibbons, A.R.I.B.A., and Godfrey Collcs.

THE SANITARY INSTITUTE:

ANNUAL DINNER.

THE annual dinner of the Sanitary Institute was held on Monday in the Whitehall Rooms, Hotel Métropole, Dr. R. Farquharson, LL.D., M.P., Vice-President, presiding. There were also present Sir J. Ure Primrose (Lord Provost of Glasgow), Sir William Church, Bart., K.C.B. (President of the Royal College of Physicians), Sir R. Douglas Powell, Bart., Sir Francis S. Powell, Bart., M.P. (Vice-President), Sir R. M. Hensley, J.P. (Chairman of the Metropolitan Asylums Board), Lt.-Col. A. S. Jones, V.C., Professor A. Bostock Hill, Professor J. Tweedy (President of Royal College of Surgeons), Professor H. R. Kenwood, Professor A. Macfadyen, Professor H. Robinson, Dr. J. F. J. Sykes, Professor G. Sims Woodhead, Dr. E. Klein, F. R. S., Dr. W. Collingridge, Dr. Andrew Clark (Chairman of Council of the British Medical Association), Dr. J. Groves, Dr. S. Rideal, Dr. Louis C. Parkes, and Messrs. W. Whitaker, F.R.S. (Chairman of Council of the Institute), Maurice Fitzmaurice, C.M.G., A. H. Reid, A. Wynter Blyth, Shirley Murphy, W. Hills, W. D. Scott-Moncrieff (President of Association of Sewage Works' Managers), T. W. Aldwinckle, H. H. Collins, T. W. Cutler (Treasurer), H. D. Searles Wood, A. Saxon Snell, H. Tanner, J. Osborne Smith, F. H. A. Hardcastle, A. Ritchie, E. C. C. Tidman, Isaac Young (Chairman of Council of Sanitary Inspectors' Association), E. White Wallis (Secretary), and others.

The loyal toasts having been suitably honoured (the Chairman alluding in feeling terms to the loss the Institute had sustained during the past year by the death of the Duke of Cambridge, who for twenty-two years was a member of the Institute and for eight years its President),

Sir R. M. Hensley, J.P., proposed "The Navy, Army, and Auxiliary Forces," coupled with the name of Lt.-Col. R. H. Firth, R.A.M.C., who responded.

Sir R. Douglas Powell, Bart., then proposed "The Houses of Parliament."

Sir Francis Sharp Powell, Bart., who responded, said that the aims and the ambitions of the Institute were the aims and ambitions of the House of Commons. Much had been done during the last half century by legislation to improve the physical condition of the people, and so much had been accomplished that the time had come when the local administration of the laws of health was in arrear of the enactments of the Legislature. The time had come when Parliament might look back with some satisfaction upon the work which had been accomplished. There was a marked diminution of the number of houses consisting of one tenement only, and that improvement meant a change in the condition of the people beyond calculation; and there was also a most gratifying increase in the houses built under more sanitary conditions. He believed that in many of our towns the housing problem was almost solved, and there had been a marvellous increase in the number of houses built in towns in close proximity to the railways. This market not only a growth in population, but it indicated that there had been a migration from bad houses to good. Parliament might legislate and local authorities might administer, but the final stage was that every man must, if he might say so, "clean his own doorstep," and one of the most important things to be done was to send sanitary missioners from house to house to teach people their duty and how they could best procure their comfort, happiness, and sobriety. It was by the education of the people that this domestic reform could be made possible. It was useless to build houses and streets unless they were well used by those for whose benefit they were intended. There was a Bill now being matured by Government officials to consolidate the public health laws in England and Wales so that the laws might be easily administered so far as that was possible with so complicated a problem. As to our rivers, he had introduced the Purification of Rivers Bill year after year, and now the whole external opposition to it had disappeared, and it appeared on the notice paper on the House of Commons without a single objector.

The Lord Provost of Glasgow, in proposing "The Sanitary Institute in Great Britain and the Colonies," said it was difficult to realise how, twenty-five years ago even, sanitary matters were neglected and disregarded. From the cottage to the palace every element that contributed to the life and happiness of the household seemed to be considered except the very elementary and necessary condition of sanitation. Even the hosiptals showed, in major operations, a death roll of 37 per cent.; but thanks to wise sanitary administration and under the antiseptic treatment of Lister, that rate had been reduced to about 2 per cent. Their work, founded in approbrium almost—for even scientifi and educated men scouted the idea of sanitary progress becoming a gospel—was now bearing fruit, and they were thankful that the Institute had become a potent force in our midst. The duty of municipalities towards an Institute like this should be one of loyal support, for when he found that the Institute sent out year after year so many trained intellects to aid the municipalities he felt that the debt of those municipalities was a real one. During last year 18,000 individuals had listened to the instruction given by the Institute, and many of them had taken diplomas and had gone out to help in the cause of sanitation. The municipalities should devote themselves to making life happier, healthier, and better, and should attack the problems associated with dirt, disease, and death, and provide the remedies that would minimise these adverse forces. They should devote themselves to such matters, and should neglect those things which could be done very well without them. When the Institute visited Glasgow in July, he hoped they would see some works that would prove instructive. As to the purification of rivers, the Institute would see how a filthy ditch had been transformed into a tolerable river, for a fortnight before the visit the Corporation of Glasgow would open their great sewage works.

The Chairman, in response, said that they had an admirable secretary and officials, and that during the past year the Institute had held forty or fifty meetings, which had been attended by 18,000 people. The increase in the work of the Institute made it necessary that they should obtain a new and larger home, and, now that the London County Council had become the educational authority for London, it would be a great opportunity for them to recognise the value of practical teaching in connexion with the public health

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of London by affording the Institute facilities for the establishment of a teaching school of hygiene worthy of the great metropolis.

Mr. A. H. Reid, Chairman of the Board of Examiners for British South Africa, also replied. After many years' service as a municipal engineer and as a city councillor of Johannesburg and Cape Town, he was of opinion that the chief need in South Africa was a common sense of decency and hygiene, especially among the coloured and lower classes, a loyal submission to the authorities who were appointed to administer their sanitary affairs, and a more efficient supervision of suburban and country areas to prevent the spread of disease between the larger centres of population and those areas. He was strongly of opinion that to the inefficient cleansing and sanitary administration of the Cape Government railway stations, passenger carriages, and goods trucks must be attributed to a great extent the spread of tuberculosis. Another serious cause of preventible disease was overcrowding in the dwellings of the working and coloured classes and deficient observance of the necessity for light, air, and cleanliness on the part of that section of the heterogenous community, and some of the chief causes of this overcrowding was the high rentals of houses. As to what was being done in South Africa in the matter of sanitation, the Corporation of the City of Cape Town had voted the sum of 300*l.* per annum for two years as a contribution to the funds of the examining body of the Institute for the purpose of providing lectures in elementary science, physics, etc., to young colonists who desired to obtain the Institute's diplomas for the offices of sanitary inspectors, etc. Last October the first examination was held in Cape Town, and nineteen candidates presented themselves, nine of whom passed, and in March an examination was held in Durban. They were considering the necessity of holding local examinations in Johannesburg, Bloemfontein, Bulawayo, and other capital centres, but they experienced difficulty in the matter of training and educating candidates in other centres than Cape Town and Durban, as they (with the exception of part of Port Elizabeth) were the only towns in South Africa that had a complete modern system of water carriage sewers and ample water supplies. In conclusion, he referred to the excellent work of the Secretary of the Board of Examiners in South Africa, Dr. Jasper Anderson.

Mr. W. Whitaker, F.R.S., also replied. Some of the meetings of the Institute in the provinces were better attended than the London meetings. As to the meeting in Glasgow this year, there would be a very complete exhibition. Mr. Whitaker referred to the large amount of work carried out by the Council of the Institute and of the committees, and by the Secretary, Mr. Wallis, the Board of Examiners, and others.

On the motion of Sir J. Ure Primrose, a vote of thanks was passed to the Chairman, who replied, and the proceedings terminated.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—A visit of this Institution took place on April 29 to the Cassland-road Higher Grade Board School, Hackney, to inspect the heating and ventilating systems installed there. A noticeable feature was the process of filtration at the air supply or main intake. A special device in the form of two large drums slowly revolving, on the peripheries of which is laced a layer of fibrous matting, is provided for this purpose. The drums revolve in water, and offer to the impinging air a continuously saturated surface. The friction caused by the fibrous matting through the water, and the water disturbance associated with it, causes the fibres to release the dust, smuts, etc., gathered, and all the sediment thus trapped is passed through the waste pipe to the drain. After being dealt with in this matter the whole of the air passes through two disc fans driven by an electric motor of 17 B.H.P. The duty of these fans represents the propulsion of something like twenty tons of air into the building per hour, and a commendable and striking characteristic is the general freedom from draughts. To warm this enormous mass of air a Cornish boiler is employed, generating steam at low pressure and feeding a series of heating batteries distributed at the bases of the rising flues to each room, and which were noticed in the main air duct. Condensation is all returned to the boiler, but the level of the ground prevents this being done by gravity, and consequently an automatic pump and receiver is in circuit with the heating mains. The heating batteries are each fitted with a local valve, so that, if need be, any of them can be shut out of supply without in any way affecting the other portions. All the batteries consist of gill pipes, and the bolt flanges are all faced and the joints made of asbestos rings. It was noticed that the batteries were complete with dampers or sliding shutters, the object being to give full control over the temperature. By raising or lowering the shutters the air flowing up the flues may be warmed to the maximum degree, or all cold air may be sent forward, or half warm and half cold, or any intermediate mixture of each, without curtailing the actual volume of air. The control of the temperature rests with the caretaker, and he may perform what is required of him without leaving the basement. In distributing the heating batteries at each vertical flue, the concentrated form of heater is avoided, and there is no necessity to heat the air to a high temperature as is requisite in order to make good losses in transmission, where a large heating battery is placed at the intake. As a result, the air in these schools retains its freshness and invigorating qualities. Actual tests of the air in the school-rooms by the Medical Officer to the Board showed an average of only six parts CO_2 in 10,000 volumes. The average change of air is about eleven times per hour. Messrs. Stott and Co. fitted the installation.

SOCIETY OF ENGINEERS.—The Jubilee Meeting of the Society of Engineers was held at the Royal United Service Institution, Whitehall, on Monday evening, Mr. D. B. Butler, President, in the chair. The proceedings were commenced by the reading of a "Jubilee Retrospect," being a brief history of the Society from its inception to the present time, by Mr. Perry F. Nursey, Past President and Secretary. After referring to his election as a member of the Society in 1858, four years after its inauguration, and to the fact that in one capacity or another, honorary or otherwise, including that of President, he had worked for it without a break ever since he was elected, Mr. Nursey proceeded to point out that although the Society was established in 1854, it was not then known by its present name. For the first three years of its existence, it was called the Putney Club, having been founded by students of Putney College, an institution which formerly existed for the education of engineers. The founders were Robert Monro Christie, Henry Palfrey Stephenson, and Alfred Williams, the latter of whom held the office of Honorary Secretary and Treasurer to the day of his death in 1894. The members used at first to meet periodically at the offices of Mr. Christie and Mr. Stephenson, when various points of engineering practice were introduced and discussed, on the lines of the topical discussion system, now so largely in vogue in the United States, and which was successfully adopted upon one occasion last year by the Society. In 1855, however, the formal reading and discussion of papers was commenced. In course of time a set of twenty-four rules was framed, and out of these from time to time have been evolved the comprehensive rules and by-laws by which the Society is now governed. At the Annual Meeting of the members of the Putney Club, held on December 7, 1857, Mr. Nursey stated that the Society was re-christened by its present name, "The Society of Engineers." At that date the number of members had increased to fifty-four from twenty-five, which latter was its strength at the close of 1855. This increase of numbers necessitated a larger meeting room, and No. 4 Committee-room in Exeter Hall was taken for that purpose. In course of time the Committee-room proved too small, and the Lower Hall was engaged for the meetings, which were held there for some years. A prominent feature of the year's work in 1858 was the awarding, for the first time, premiums of books for papers read during the year, the first recipients being Mr. James Amos for a paper on "The New Hydraulic Lift of the Thames Graving Dock," and Mr. John Glynn, jun., for a paper on "Dr. Clarke's Water Softening Process." The year 1861 was marked by the holding of a conversazione in the lower hall, Exeter Hall, on June 11, which function was successfully repeated in 1863. The latter year marks the introduction by Mr. Williams of vacation visits to works of engineering interest, the first visit being to the Southern Outfall of the Main Drainage Works. Later on in the year the Northern Outfall was visited. The year 1863 witnessed the institution of the class of honorary members, although none were elected until 1865. Amongst the earliest honorary members were Lord Playfair, Sir William Fairbairn, Sir John Herschel, Sir Joseph Whitworth, Dr. Percy, and Professor Macquorn Rankine. In 1864 the question of issuing certificates of membership was discussed, but their issue was not then considered desirable. They were, however, adopted in 1867 in their present form. Coming to later times, Mr. Nursey observed that the year 1900 merited notice as being that in which the present honorary secretary and treasurer, Mr. George Burt, presented the Society with the handsome badge of office in gold and enamel worn by each successive President.—A paper was subsequently read on "British and American Coal-cutting Machines," by Mr. A. S. E. Ackermann. The author gave a brief history of coal-cutting machines showing that the credit of the invention of each of the well-known types of machines was due to Englishmen, although it has been left to Americans to perfect most of the types and make large use of them. The chief types of machines in use in Great Britain are the longwall disc machine and the longwall bar machine, which were described. It was stated that the average net saving on the cost of coal getting in England as the result of the use of machines was 6d. per ton, and that the average increase of output per man employed had amounted to 65 per cent. In addition to those advantages, coal got by machinery contained 12 per cent. more round coal. The cost of a complete plant was stated to be about 1,000*l.* per machine; the individual electric longwall machines cost about 400*l.* each; the pneumatic ones 250*l.*; and the pneumatic percussive, 75*l.* to 100*l.* each. The leading three types of American machines—viz., the punching, the chain breast, and the chain cutter longwall—were also described, as well as the method of using them. The author observed that American experience was that, on the average, 10d. per ton was saved in the cost of getting by the use of machines. The chief advantages to be gained by the employment of machines were:—(1) The saving in the cost of getting; (2) the larger yield from a given number of entries; (3) the rapidity with which the working face is carried forward; (4) the increase of the percentage of lump coal; (5) the smoother floor made by the chain and disc cutters, resulting in greater ease with which the coal can be shovelled up and loaded; (6) the reduction in the accidental death-rate per million tons of coal raised; and (7) in the case of pneumatic machines, the discharge of fresh cool air at the working face. The statistics of coal-mining were very thoroughly dealt with by the author, a number of tables and a large set of curves accompanying the paper. These curves showed at a glance the present state of affairs and the past history of each item, and corresponding curves were shown for Great Britain and America. The output per machine per year in America was stated to be 11,480 tons, and in England 8,620 tons; both of these quantities being smaller than they were several years ago. According to Mr. Ackermann, the favourite type of machine in England is the longwall disc machine, 82 per cent. of all the machines being of that type. In America the punching machine was the favourite, 59 per cent. of the machines being of that type. In 1902 there were 483 machines in use in England, and 5,418 in America. In England in the same year 1·83 per cent. of the coal was cut by machines, and in America 23·5 per cent., or, if in the latter case only bituminous coal were considered, then 26·75 per cent. was cut by machines.

THE SANITARY INSTITUTE.—One of the special features of the Health Exhibition of the Sanitary Institute at Glasgow, in July next, will be a municipal exhibit, arranged by the different departments of the Glasgow Corporation. The Cleansing Department propose to arrange for, amongst other things, exhibits of a model up-to-date destructor and the Globe fertiliser, the Gas and Electric Departments the latest developments in illumination, and the Sewage Departments what they can produce from what were formerly waste products. The other departments of the Corporation will also be well represented with their different interests, illustrating the progress that has been made in municipal enterprise by the Glasgow Corporation. The social and holiday aspect of the Congress has not been overlooked, and excursions have been arranged to Loch Lomond, the Trossachs, and the Falls of Clyde, and other places of interest.

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THE COURT OF COMMON COUNCIL.

THE usual fortnightly meeting of the Court of Common Council was held at the Guildhall, under the chairmanship of the Lord Mayor, on Thursday last week.

Improvements.—The Improvements Committee reported relative to the improvement of Lower Thames-street and recommended that the surplus land between Pudding-lane and Botolph-lane be let on building lease by public auction. With regard to the improvement of St. Mary Axe, they reported having arranged for renting the corner of the premises No. 5, St. Mary Axe, and the acquisition of a leasehold interest in a portion of the open area in front of 32, St. Mary Axe. They also submitted for adoption an arrangement for acquiring the leasehold interest in 12, Mansell-street, and, further, an arrangement for acquiring the freehold interest of the Governors of St. Bartholomew's Hospital in the ground needed to widen the public way in front of 24-28, Knightrider-street, at a cost of 1,800*l.* Further, they reported on the pulling down of the following premises:—St. Alban's-court, Wood-street; 136, Fenchurch-street; 25 and 26, Cullum-street; 21, 22, and 23, Ironmonger-lane; 9, Huggin-lane; 2 and 4, Arthur-street West, and 24 and 25, St. Martin's-lane. In neither of these cases did the Committee consider it expedient to take any steps to effect improvements at these places. All the recommendations were adopted.

Paving Contracts.—A lengthy report was submitted by the Streets Committee recommending that the contracts with the Val de Travers Asphalte Co. for maintaining the pavements of a large number of streets be extended for a period of ten years. The prices varied for different groups of streets, and were from 1s. per yard super. per annum to 3r. per yard super. per annum. There were similar recommendations regarding the extension of the contracts with the Limmer Asphalte Co. and with the French Asphalte Co. It was also recommended that the contracts with the Improved Wood Pavement Co. for maintaining the carriageway pavements of the undermentioned streets be extended as follows:—For Ludgate Hill for fifteen years at 1s. 6d. per yard super. per annum, subject to the right of the Corporation to terminate the arrangement at the end of five or ten years; for Queen Victoria-street, Eastcheap, and Cannon-street for fifteen years at 1s. per yard super. per annum. Several members took exception to the length of the period of the contracts, and it was agreed that the matter stand over until the next meeting.

City Clocks.—Mr. Deputy Miller Wilkinson moved "that the regulations as to synchronising with Greenwich time be applied to existing as well as future clocks erected in the City over the public ways." Mr. Deputy White, who opposed the motion, said that the clock of St. Swithin's, Cannon-street, had kept correct time for 210 years without being synchronised. The motion was referred to the Streets Committee.

XIIIth Century Manuscript.—The Lord Mayor had before the Court an application from the hon. secretary of a special loan exhibition to be held by the Worshipful Company of Musicians for the loan of a XIIIth century manuscript preserved among the records of the Corporation. The application was referred to the Library Committee.

Thames Barrage Scheme.—Mr. Alderman Alliston presented a report from the Special Committee, relative to the scheme for the barrage of the River Thames, recommending that the Board of Trade be asked to hold a public inquiry as to the said scheme, and that it be referred back to the Committee to approach the Board by deputation for the purpose of urging upon the Board the necessity for holding such an inquiry, and that the Committee be also empowered to co-operate with other public bodies on the subject. The report was adopted unanimously.

THE HELLENIC SOCIETY.—The inaugural meeting of the Hellenic Society was held on June 16, 1879, and the Council have decided to celebrate the Twenty-fifth Anniversary in the coming summer, by holding a special meeting in the rooms of the Society of Antiquaries in Burlington House, Piccadilly, on Tuesday, July 5, at 3 p.m. The President, Sir Richard Jebb, will deliver an address, and it is hoped that short papers or addresses may be delivered by two or three of the Foreign Honorary members who may be present on the occasion. A short history of the Society from its foundation will be prepared by the Honorary Secretary, and will be published in the journal. It is hoped that as many members as possible will attend.

LONDON TRAFFIC COMMISSION.

AT the sitting of this Commission on Thursday last week evidence was given by Mr. Granville C. Cuningham, the General Manager of the Central London Railway. In the course of his evidence he suggested the construction of an "elongated double track loop" of tube railway, about six or seven miles in length, taking a breadth of from half a mile to a mile, round which trains could run in both directions all day long. Such a loop would be formed by the extension, as was proposed, of the Central London Railway to Liverpool-street, thence back to the Strand, Piccadilly, Knightsbridge-road, Hammersmith, and so to Shepherd's Bush. In connexion with such a loop other loops might come in from various quarters. Each loop should be complete, however, and should not have any physical connexion with the others, but communication should be obtained by an exchange station. In some instances a double line, running in and reversing, as the present Central London, would be sufficient.

Mr. James Devonshire, the Managing Director of the Metropolitan Electric Tramways Ltd., gave evidence at some length on behalf of that company. After describing the various undertakings owned by that company, he proceeded to deal with the disadvantages which would be likely to arise from the operation of the 43rd section of the Tramways Act of 1870, and mentioned several cases where the enforcing of the powers of compulsory purchase would be likely to lead to complications owing to one pair of the tram-rails being in one county and the other in another.

On Friday Mr. H. Montague Bates, Chief Clerk of the Public Health Department of the Corporation of London, submitted some statistics of the traffic in the City streets. Among the tables submitted by the witness were two which showed the number of persons who cross by the roadway the open space in front of the Mansion House and the number who use the subways at the same spot. The observations from which the figures were derived were made on two Thursdays in 1903—one, the day on which the subways were watched, in March, and the other in April. As the weather on both occasions was recorded in the tables as "fine," the days were apparently looked upon as exhibiting identical conditions. The hours of observation on each occasion were from 6 a.m. until 12.30 a.m. It was found that, whereas 61,185 persons crossed by means of the subways, 248,015 preferred to cross the carriageway. In the course of his evidence Mr. Bates said that the sum expended out of the rates on street improvements in the City had amounted since the year 1848 to nearly 3,000,000*l.*; that was the sum which remained after deducting the amount realised from sales of surplus land and the contributions made by the London County Council and the old Metropolitan Board of Works. The average annual cost of paving the City streets had increased from 22,806*l.* for the ten years ending 1890 to 38,043*l.* for the ten years ending 1900.

Mr. Joseph Douglass Mathews, F.R.I.B.A., F.S.I., was then called. He said that he was a member of the Corporation of London and Deputy of Dowgate Ward, and was well acquainted with the City geographically and the special business carried on in its several localities. The many changes that had taken place during fifty years in the conduct of trade, and by the formation of new and improved streets, had brought about an enormous increase in both the foot and vehicular traffic in the City proper. Formerly all manufactured goods not produced in London were sent in bulk for the provinces and foreign countries to agents, where the goods were sold and distributed to retailers. Almost all the goods imported or exported were from the wharves and quays on the river, or at the various docks. Manufactories were situated in the City or its immediate neighbourhood. Now much of the manufactured goods was sold by sample, and sent direct from the manufactories to the retailers. Year by year the manufactories were being removed to the suburbs or the country. The increased accommodation in the docks caused a large addition to the heavy traffic, and this was further augmented by the number of omnibuses which crowd the main thoroughfares. Those circumstances pointed to the necessity of relieving the centre of the City as much as possible. What was wanted was more direct communication from east to west, and from north to south. The greater part of the traffic from south to north and north-east passed over London Bridge. Southwark Bridge was convenient for the manufactories in Southwark, but the steep approach from Upper Thames-street was very inconvenient. More than twenty years ago he advocated the formation of a spur street from the crown of Southwark Bridge carried over Upper Thames-street by a viaduct. The street would then be continued in a westerly direction to Queen Victoria-street at or about the end of Bread-street. By widening Bread-street on one side the traffic could turn off in an easterly or westerly direction through Queen Victoria-street, Cannon-street, and Cheapside. The street could be continued northward by widening Wood-street, or by forming a new street somewhat to the west, to Old-street, and thence to Islington. At the southern end the road would be continued by Southwark Bridge-road and thence to the various parts of South London. Witness went on to deal with the traffic from west to east, and said that any attempt to widen Cheapside would be considered vandalism. He suggested the formation of a new street commencing in Smithfield, and passing immediately on the south side of St. Bartholomew's Church, and through some of the smallest and least valuable property to Aldersgate-street. The street would then be continued by widening Jewin-crescent. The portion of that street from Smithfield to St. Giles' Church had been under the consideration of the Corporation for some time. The cost was estimated at about 850,000*l.*, and with the additional land on the north side at 1,225,000*l.* The cost was the stumbling block, and the undertaking would be too great unless the L.C.C. would contribute largely. In the course of further evidence the witness said that a regular service of trains would be a great convenience for persons travelling from the North and Midlands to the South of England, and would save driving through the streets.

METROPOLITAN ASYLUM BOARD.

THE usual fortnightly meeting of this Board was held on Saturday last week at the offices, Victoria Embankment, Sir R. Hensley in the chair.

On the recommendation of the Finance Committee it was agreed to apply to the Local Government Board for orders sanctioning the expenditure of the following sums:—15,900*l.* on the part adaptation of the buildings at Belmont Asylum for the accommodation of male unimprovable imbeciles, and on drainage work; 280*l.* on the provision of bath-room, etc., in the female staff quarters of Caterham Asylum; and 320*l.* on the installation of telephones and fire-alarms at Levesden Asylum.

North Western Hospital.—The Hospital's Committee reported the receipt of a letter from the London County Council stating that before they could renew the licence for the ten temporary wards and the temporary chapel at the hospital, certain fire-resisting works would have to be carried out. On the recommendation of the Committee it was agreed to carry out the suggested works. The estimated cost is 4,500*l.*

Belmont Asylum.—On the recommendation of the Works Committee Messrs. R. L. Curtis and Sons were appointed to take out the quantities of the alterations, etc., to be carried out at this asylum.

Darenth Asylum.—On the recommendation of the Asylum Committee it was agreed to refer the matter of the re-modelling of the fire-alarm system at this asylum to the Works Committee. The Committee reported having considered the re-arrangement of the accommodation for the principal officers at the asylum, and the Works Committee, were, on the recommendation of the Committee, instructed to arrange for alterations as follows:—

(i.) The rooms above the medical superintendent's house in the adult department, at present occupied by servants of the asylum, to form part of the house, a partition wall being erected to cut them off from the rest of the administrative block, and an internal staircase being provided to give access to them from inside the medical superintendent's house.

(ii.) The quarters in the adult department, at present occupied by the steward, to be allocated to the matron, with the exception of two rooms (the steward's dining-room and kitchen) which will be used as offices, certain alterations to the dividing wall and doorway being necessary to cut off these two rooms from the remainder.

(iii.) The house in the children's department formerly occupied by the medical superintendent of the schools to be allocated to the chaplain.

(iv.) The quarters in the children's department formerly occupied by the assistant steward to be allocated to the steward, together with the room formerly used as the clerk's office.

Tooting Bec Asylum.—An increase of 475*l.* in the estimate of cost of the tar-paving of the paths and airing courts was sanctioned.

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COMPETITIONS.

THE NEW WESLEYAN CHURCH HOUSE.—Mr. R. W. Perks states that the trustees of the Wesleyan Million Fund are making the following arrangements for the erection of the Wesleyan Methodist Hall and Connexional Offices at Westminster:—The trustees propose to invite architects to submit preliminary sketches or designs for the buildings to be erected on the corner site fronting Princes-street and Tothill-street. The buildings will cover an area of about 35,000 sq. ft. The conditions under which architects will be invited to send in preliminary sketches with a view to a subsequent limited competition among selected architects will be settled by the trustees in consultation with Mr. Aston Webb, their architectural adviser. The Wesleyan Conference has instructed that the buildings shall be of a monumental character and worthy of the position they will occupy. The amount proposed to be expended on the buildings, irrespective of land, is 120,000*l.*

FREE LIBRARY AND PUBLIC OFFICES, ILKLEY.—The result of the competition for this building was announced as follows at a meeting of the Council on the 4th inst.:—First, 100*l.*, to be merged in the commission for the work, Mr. W. Bakewell, F.R.I.B.A., Park-square, Leeds; second, 50*l.*, Mr. R. T. Longden, Morland-road, Burslem; third, 20*l.*, Messrs. S. Warwick, A.R.I.B.A., and H. A. Hall (joint architects), 98, Lancaster-road, London. The cost is not to exceed 10,053*l.* Mr. G. B. Bulmer, F.R.I.B.A., acted as adjudicator and adviser to the Council. There were sixty sets of designs sent in.

TORQUAY MUNICIPAL BUILDINGS.—We learn that the name of the author of the second premiated design should have been given as "Messrs. Harris and Towse," not "S. Towse" only. The mistake was not ours.

Illustrations.

SOUTH WALES UNIVERSITY COLLEGE, CARDIFF.

WE give this week complete illustrations of the new building in progress for the South Wales University College at Cardiff, from the designs of Mr. W. D. Caröe, who, it will be remembered, gained the commission as the result of a limited competition last year; Mr. Belcher, Mr. Champneys, and Mr. Marshall being the other competitors.

The birds-eye view is from the drawing now hanging at the Royal Academy; the elevations and plans are from the competition drawings, and were lithographed at the time of the competition, but their publication was withheld at the time, at the request of the architect, and for a special reason. We have given the plans to a large scale, as we consider this is one of the best thought-out plans for a large and complicated building which we have seen of late years, and it is probably to this element in the design that its selection was largely due.

We take from a copy of the report sent in with the design a few notes as to the objects kept in view by the architect.

A dominating feature of the plan is the formation of two interior courts architecturally screened off from the great court. There convex angle screens provide entrances from the great court for men and women students in corresponding angles of the building, and serve entirely to conceal the respective sanitary accommodation, which is placed in almost detached circular blocks behind them, the ventilation of which is thoroughly provided for.

The Council room is arranged centrally over the main park entrance.

Under the research laboratory a cellar has been planned, not asked for in the instructions, in order to lessen vibration by deepening the foundations, and a detached concrete wall surrounds the basement, up to the surface of the ground, as a buffer against earth vibrations.

Ventilation will be by fans driven at a general inlet, propelling the air along two main ducts, one under the other, and both under the building. Radiators heated from the boilers are ranged in the upper duct. An upcast flue connected with the hot and cold ducts is carried to a point 8 ft. from the floor level in each of the rooms to be heated, a valve in the room regulating the proportion of hot to cold air introduced. Extract fans are arranged in chambers in the roof, and special fans for extracting from the fume closets in the chemical department. The opening of the windows, when desired, will not affect the ventilating arrangements.

In the architectural design harmony with the new Municipal buildings has been considered. Simplicity and reserve in form and feature have been the aim, and no costly dominating note, such as a tower or cupola, has been introduced. The elevations of the machine and testing shops have been purposely devised to suggest their engineering purpose.

Portland stone is to be used internally, except in the brick courts, and in the narrower courts and the areas white glazed bricks will be used. Where the roofs show they will be covered with Whitland Abbey or Tyrch slates; the unseen roofs will be constructed of steel and coke breeze concrete, covered with Pyramont asphalte. The type of architecture adopted allows for the free use of roofs arranged not to be externally visible, whereby external unsightliness in connection with roof lighting is avoided, and provision is thus made for fireproof roofs as well as floors. As we have already remarked, the impression given by a bird's-eye view, which shows all these roofs, is so far unfavourable, and it must be remembered that these, however obvious in the view, will not be seen in reality.

Correspondence.

THE R.I.B.A. COUNCIL ELECTION.

SIR,—A practice is arising in elections to the Council of canvassing the Institute on behalf of lists of candidates who are expected to support a particular policy or to interest themselves in one branch of the Council's work.

This practice of electing the Council upon the system of "planks" and "platforms," if allowed to prevail, may cause the qualification of candidates for the more important elements of the Council's work to be overlooked, and the effects of the employment of electioneering tactics will, in a few years, cause men of high standing to hold aloof from the conduct of the affairs of the Institute.

The responsibilities of the Council in their confidential relations with the Government and with great public bodies, upon which the growth of the influence of the Institute for the general benefit of Architecture and of the Profession depends, and the important claims of education and of its statutory and other examinations, demand qualities of professional reputation, experience and judgment which are not necessarily to be found in candidates who are the earnest advocates of one particular policy; and with deference to liberty of judgment in view of such canvassing, it is to be earnestly urged upon members to weigh carefully the very important character of the Council's duties in recording their votes in the forthcoming election.

BEDFORD PITE.

"REGISTRATION OF ARCHITECTS."

SIR,—May I be permitted to say a few words in reply to Mr. Gilbee Scott's very ingenious letter in your last issue.

It is quite true that he sent his circular to the members of the Registration Committee before that committee first sat. But he omits to add that, when it met, one of the first things it did was to pass a practically unanimous vote requesting Mr. Gilbee Scott not to issue it to the members of the Institute generally, pending the deliberations of the Registration Committee.

Unfortunately, this resolution was not officially conveyed to Mr. Scott in time for his next committee meeting, but his committee knew all about it, as Mr. Seth Smith wrote to Mr. Scott informing him of it and Mr. Cross was present at both the meetings of the Registration Committee and of the so-called "London Committee" when it was resolved to send out the circular and take a "poll," in spite of their having been requested not to do so. This is what Mr. Scott calls assisting the Council!

Another point is that Mr. Scott speaks the whole time as if the Council of the Institute had the matter in hand, whereas it is a committee specially appointed at a general meeting of members, and not the Council, which is considering the question. Of course the Council is largely represented on the Registration Committee, but the "London Committee" appear to think that the best way to expedite matters and "assist" is to largely reconstitute the Registration Committee by electing a different Council.

The one redeeming feature about the whole movement is that several members of Mr. Scott's committee resigned as soon as they found what was being done, another fact that Mr. Scott omits to mention.

As to Mr. Scott's special pleading on the question of the poll itself, he tells us that 95 per cent. of the answers were in favour of Statutory Qualification, but he omits to tell us what proportion the answers bear to the total number of circulars sent out, or how many went into the waste-paper basket. But even granting that his figures are imposing, they do not alter the fact that the Institute has appointed a committee to report on the subject, whereas the "London Committee" has appointed itself, and has taken its poll, in spite of being requested not to do so by the appointed representatives of the Institute. Mr. Gilbee Scott and the rump of his supporters may think this action justifiable, but it is doubtful if many others will agree with them; and, if he and his committee continue their mischievous career by endeavouring to obtain the return of only their special candidates at the pending election, they will "assist" in prejudicing the question, instead of helping to bring about the calm, deliberate, dispassionate, and business-like consideration of the whole subject which I feel sure is the spirit in which the vast majority of the members of the Registration Committee are considering it; at least, that is the spirit, I can answer for it, of

ONE OF THEIR NUMBER.

OLD BUILDINGS NEAR MANCHESTER.

SIR,—The Manchester Society of Architects is endeavouring to compile a complete list of all old buildings in a district, seventy miles square, surrounding Manchester, which may be worthy of the attention of architects; to include very brief notes of their character, date, and comparative importance, with a map to show their positions. Such a list should, we think, be of considerable value to architects, both to those living in the district, and also to visitors, so that we feel justified in asking for some outside assistance in the extensive work of collecting information.

We have printed a preliminary list (of which a copy is enclosed), containing slight notes on some 350 buildings, and we earnestly hope that some of your readers may be willing to co-operate with us in making the list more useful to architects; either by correcting errors in the present list, amplifying the notes (which are at present far too crude in most cases), suggesting additions, or giving photographs or reproductions of drawings of the buildings for our Library Reference Portfolio.

To anyone willing to take even a very small share in the work we shall be glad to forward a copy of the preliminary list.—For the Map Sub-Committee, ALFRED E. CORBETT, Editor.

78, Cross-street, Manchester.

The Student's Column.

ARCHES.—XVIII.

INASMUCH as the dead load upon an arch is generally much greater than the live load, an arch designed so that the line of resistance follows the axis for the dead load and a live load across the span will usually be safe for a moving load. It is generally necessary to consider only two cases, one with a moving load over all, and the other with a moving load over one-half of the span.

If the result of a trial is to show that any line of resistance for the combined dead and live loads extends beyond the middle third of the arch ring, the thickness of the ring may be increased. A new determination need not necessarily be made, especially if the line of resistance for the dead load coincides with the axis of the arch.

When the entire load is stationary, as in an aqueduct or an arch sustaining part of a building, and when the entire load is practically stationary, as in an arch at a considerable depth below the surface of the ground or of an earthen embankment, the weight of the spandrels can be regulated so as to cause the line of resistance to follow very closely the axis of the arch ring.

In the preceding article we have already dealt with one type of arch (see Figs. 68 and 69), in which this result can readily be attained. The following method is applicable to any form of dead load:—

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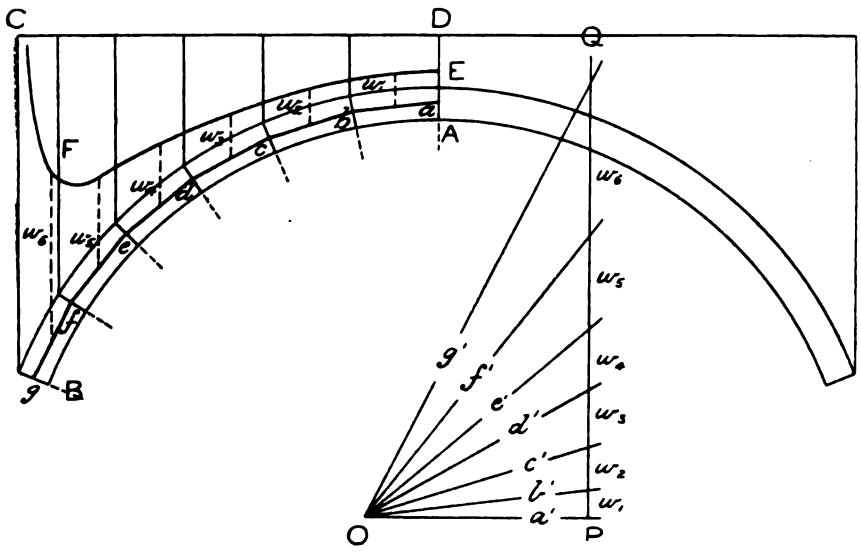

Fig 71.

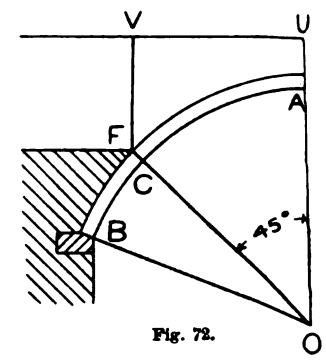

Fig. 72.

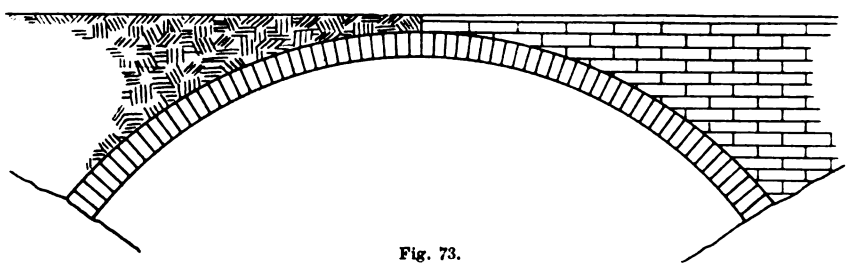

Fig. 73.

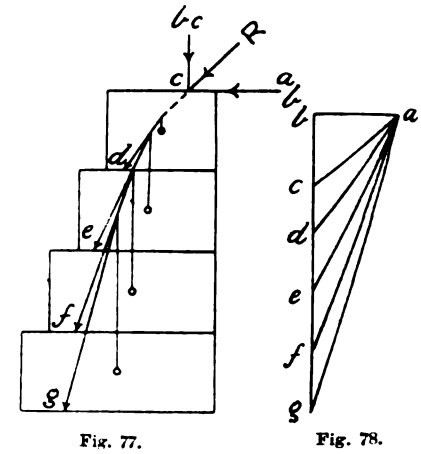

Fig. 77.

Fig. 78.

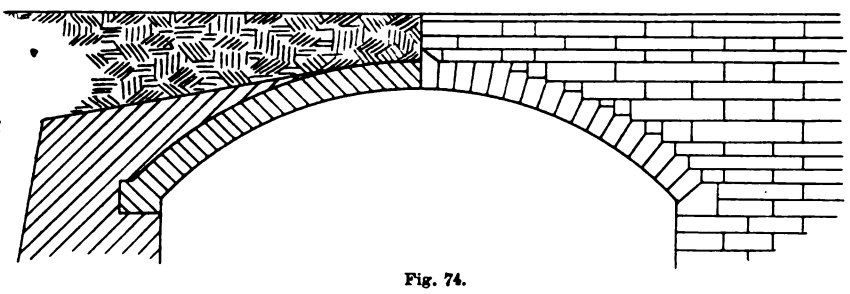

Fig. 74.

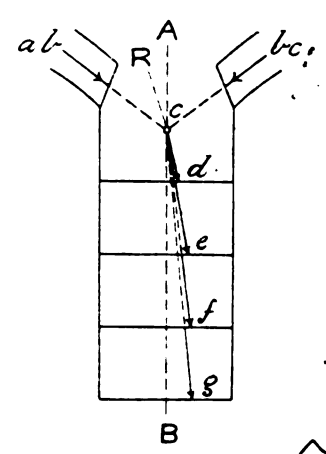

Fig. 80.

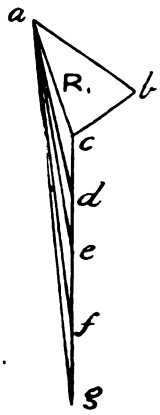

Fig. 81.

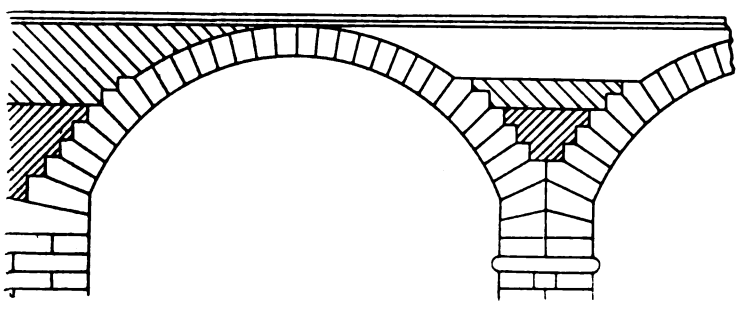

Fig. 75.

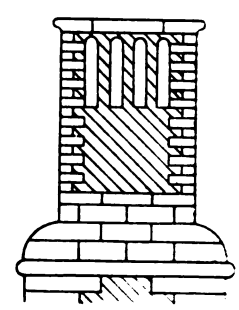

Fig. 76.

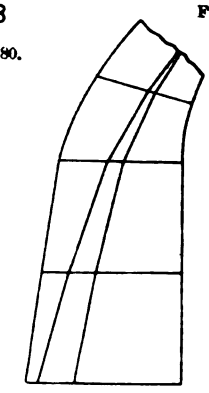

Fig. 79.

Let Fig. 71 represent an arch for which it is required to dispose the loading so that the line of resistance may coincide with the axis of the arch ring.

Considering the left hand side A B of the arch, divide the masonry ring and the load into any number of convenient parts by vertical lines, and radial lines intersecting the axis of the arch at the points $a\ b\ c\ d\ e\ f$ and g. Then construct a force diagram, drawing from any point O the radiating lines $a^1\ b^1\ c^1\ d^1\ e^1\ f^1\ g^1$ parallel to the tangents of the axis of the arch ring at the points $a\ b\ c\ d\ e\ f\ g$, and draw the vertical line P Q at such distance from O that w_1 shall represent, to any convenient scale, the load on the section $a\ b$ of the arch ring, including the weight of the voussoirs. Then the distances $w_1\ w_2\ w_3\ w_4\ w_5$ and w_6 on the vertical line P Q represent the required values of the loads on the several divisions of the arch.

Lay off the distances w_1 to w_6 at the centres of the respective sections vertically upwards from the centre line of the arch ring, and draw the curve E F. This represents approximately the upper limit or contour of the homogeneous load that will cause the line of resistance to pass through the centre of each joint.

By suitable variation of the material forming the spandrel filling up to the formation level C D, and by arranging for vacant spaces as required, the actual load can be made equivalent in intensity and distribution to the reduced load indicated by the diagram, and the thickness of the arch ring can be reduced to a minimum.

It will be observed that the distance between the load contour and the arch ring increases rapidly with the angular distance from the crown, and that the increase is particularly marked as the springing is approached. For a semi-circular arch the distance is infinite, as the reader may readily prove for himself by the construction of a diagram forming a continuation of Fig. 71. Hence it follows that it is impossible to load a circular arch beyond a certain distance from the crown, so that the line of resistance shall coincide with the axis of the arch ring.

For this reason it is usual to consider the ring to act as an arch only within an angular distance of 45 deg. on either side of the crown, and to build up heavy backing to the corresponding level. (See Fig. 62, p. 393.)

Rankine demonstrates* that the horizontal thrust is nearly equal to the weight supported between the crown and that part of the soffit

* "Civil Engineering," p. 424.

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whose inclination is 45 deg. Thus, in Fig. 72, let A C B represent one-half of a circular arch, O being the centre of the intrados, and O A its radius. Draw O C F, making the angle A O C = 45 deg. with the vertical; then the horizontal thrust of the arch will be nearly equal to the weight of the mass A C F V U which lies between the joint C F and the crown. The point F is that up to whose level the backing should be carried up solid, or, at all events, be bonded or jointed in such a manner that it shall be capable of transmitting the required horizontal thrust.

It is frequently desirable, however, to carry the backing still further towards the crown, its extent and thickness being varied according to circumstances.

Solid backing may be provided by thickening the arch ring between the apparent springing and the joint of rupture, or the arch ring may be reinforced by coursed masonry, rubble, or concrete laid outside and above the voussoirs.

Backing is occasionally built in radial course, forming extensions of the bed joints of the voussoirs, but is more generally laid in horizontal courses, abutting against the arch ring, some stones of which project so as to insure a good bond. Sometimes the outer ends of the voussoirs are cut with horizontal faces, as in Fig. 62, p. 393, the backing being built in courses of the same depth as the steps so formed, and bonded with them.

In small arches the outer spandrel walls are often filled with earth from the arch ring up to the road level, as in Fig. 73. As we have already pointed out in Article VII., p. 170, earth so employed cannot exert a vertical pressure equivalent to its weight, and the action of the side walls tends further to relieve the arch ring from the direct pressure of the earth. When a retaining wall is built above the abutments, as in Fig. 68, the earth filling may, however, be regarded without much error as exercising vertical pressure upon the arch ring.

Fig. 74 shows an arch in which the spandrel, between the arch ring and the road level, is partly filled with masonry backing, sloping gradually from the crown towards the springing, the remaining space being filled with earth between longitudinal walls.

When earth filling is adopted, *tie-walls* built transversely between the longitudinal spandrel walls may be necessary for affording lateral support to the latter. The distance from centre to centre of the tie-walls should be about four times the distance between the centres of the spandrel walls.

Fig. 75 shows two methods of lightening the spandrels—(1) By the use of brick filling above the backing; and (2) by leaving an empty space above the backing. Fig. 76 shows another method of lightening the spandrels by the use of longitudinal brick-arched openings.

It is very difficult to determine the precise value of the stability added to an arch ring by the employment of backing, but it is quite certain that the additional security thereby afforded is very considerable. Well-built masonry can be stepped out to an angle of fully 50 deg. from the horizontal, and remain perfectly stable, providing its weight is properly counterbalanced. Consequently cases often occur in which the visible ring of voussoirs in an arch is chiefly useful as an ornament, and its value, so far as stability is concerned, may be actually less than that of the masonry backing.

The top of the backing, or any parts of the upper surface of the arch ring that are simply covered with earth, should be protected by a coating of cement mortar, coal tar, or asphalt to prevent the percolation of water. Where voids are left in the spandrel filling, ventilation holes should be provided, and drain pipes must be inserted wherever necessary for the removal of water. In arched bridges of more than one span, drainage is usually effected by sloping the upper surface of the backing from each side and from the centre of each span towards a central point over each intermediate pier. Water thus collected can be discharged by drain pipes passing through the haunches.

The stability of an abutment cannot be considered separately, for it is governed by the position of the line of resistance of the arch. Therefore, for the purposes of calculation, the abutment should be treated as forming a part of the arch, and its stability can be determined by extending the load line of the force diagram drawn for the arch, so as to include the forces acting upon the abutment. The reactions can then be obtained in the usual manner, or by the following method:—

Let Fig. 77 be an abutment subjected to a horizontal force $a\ b$, and a vertical force $b\ c$ of which the resultant $R = a\ c$ acts at the point c. These forces, together with the weights of the four blocks of the masonry, are set out to any convenient scale as indicated in Fig. 78. The weights of the four blocks are $c\ d$, $d\ e$, $e\ f$, and $f\ g$, and their centres of gravity are shown in Fig. 78 by small circles. The pressure on the point d is the resultant $a\ c + c\ d = a\ d$, the line of action of which passes through the intersection of $a\ c$, and a vertical line through the centre of gravity of the block, the point of application at d being indicated by an arrow parallel to $a\ d$. The resultant pressures at the remaining points e, f, and g, in Fig. 77, are parallel and equal to $a\ e$, $a\ f$, and $a\ g$, in Fig. 78. A line connecting the points of application c, d, e, f, and g, of the resultant pressures on the successive joints of the masonry would be the line of resistance for the abutment.

Fig. 79 shows two lines of resistance for the abutment of the semi-arch, illustrated in Fig. 47, p. 229. The inner of these lines has been determined by a continuation of the method described in Article IX., and the outer line by a continuation of Scheffler's method, described in Article XI.

In the former case, although the horizontal components of the external forces acting upon the arch ring are duly considered, the horizontal component of the external force acting against the abutment is disregarded, and, if taken into account, the line of resistance would be still nearer the axis of the abutment than is shown in Fig. 79. It is evident that if Scheffler's line of resistance be accepted, the width of the abutment must be considerably increased to comply with the condition of stability which dictates that the line of resistance must lie within the middle third.

Consequently, we find that any theory of arch construction in which the external forces are assumed to be entirely vertical, clearly necessitates much heavier abutments than a theory in which the existence of the horizontal components is properly recognised.

When this line of resistance has been determined, the stability of the abutment against failure by rotation, and against failure by crushing, may be considered, as described in Article IX., p. 229. By the same article it will be seen that stability against sliding is to be assured by making the joints of an abutment nearly perpendicular to the line of resistance. Hence the construction of the abutment in radiating courses is clearly conducive to maximum strength and stability, especially when the foundation is good and the height of the springing is not great. The face of an abutment so built is really a continuation of the intrados of the arch, and its back is a continuation of the extrados of the backing, which should likewise be built in radiating courses.

Although the advantage of radiating joints is generally recognised, many designers make it a practice to hide this form of construction by outer walls of masonry laid in horizontal courses. This practice is strongly to be condemned, as it is entirely contrary to the principles of true artistic design to hide the characteristic features of a structure in this manner.

In the design of abutments generally it must be remembered that not only has the outward thrust of the arch to be resisted, but the inward thrust of the earth. In arches of considerable span the former is the more important factor; and in small arches, particularly those having a heavy surcharge, the latter is the more important. Consequently for large arches, or for arches of which the surcharge is small proportionately to the span, the abutments should be designed with especial regard to the thrust of the arch; and for arches of which the surcharge is proportionately great, the abutments should be designed to act as retaining walls.

Abutments are frequently built with transverse archways, or with internal hollows. This practice is advantageous, as conducing to stability and economy. When archways are employed inverts should be built at the bottom with the object of distributing the load over the greatest possible area.

To provide for the permanent stability of a pier common to two arches, it is essential that the line of pressure should be confined to the middle third of the masonry.

Let Fig. 80 be a pier resisting the thrust of an arch on either side. The thrust of the left hand arch is $a\ b$, and that of the right hand arch $b\ c$, the point of intersection being at c. In this case it is assumed that $a\ b$ is greater than $b\ c$. To any convenient scale, lay off the two forces $a\ b$, $b\ c$, and the weights of the four blocks $c\ d$, $d\ e$, $e\ f$, $f\ g$, of the pier masonry, as in Fig. 81. The direction of the resultant pressure at the point c in Fig. 81, is $R_1 = a\ c$, and the resultant pressure on the joint d is the resultant of $a\ c + c\ d = a\ d$, its line of action $c\ d$ passing through c. The lines of action of the pressures on the remaining joints will also pass through c, as the centres of gravity of all the masonry blocks are on the vertical line A B, passing through this point. These lines of action $c\ d$, $c\ e$, $c\ f$, and $c\ g$, are parallel respectively to the resultants $a\ d$, $d\ e$, $a\ f$, and $a\ g$ in Fig. 81.

If the thrusts of the two arches were equal in intensity and direction, the resultant line of pressure on the pier would necessarily lie along the vertical axis A B.

An *abutment pier* is designed to reflect vibrations passing from arch to arch along a viaduct. During the erection of the structure it acts as an abutment, as, for instance, when the arches on one side are partly built. The temporary line of pressure during the construction of the arches may then approach nearer to the outside of the pier than would be permissible afterwards, as the load is perfectly steady and in one direction only. Hence the line of stress may temporarily lie outside the middle third of the masonry, and under such circumstances it may be safe to permit the centres of stress to approach to within one-eighth of the thickness from the outer face of the masonry.

If by any misadventure one arch of a series should collapse during construction, or afterwards, the damage should only extend to the nearest abutment pier. In a long viaduct, simply supported by common piers, the failure of one span would almost inevitably be followed by the failure of the entire structure. Therefore it will be seen that the incorporation of strong abutment piers at suitable intervals is a most necessary precaution.

BOOKS RECEIVED.

GREAT MASTERS: REPRODUCTIONS IN PHOTOGRAVURE. Part XIV. (W. Heinemann. 5s.)

SLINGSBY AND SLINGSBY CASTLE. By the Rev. Arthur St. Clair Brooke. (Methuen and Co. 7s. 6d.)

HOMES FOR THE COUNTRY. By R. A. Briggs, architect. (B. T. Batsford. 10s. 6d.)

A POCKET-BOOK OF TABLES AND MEMORANDA. By J. Wright Clarke. (B. T. Batsford. 1s. 6d.)

THE ART OF MASONRY IN GREAT BRITAIN. By William Diack. (Offices of the *Stone Trades' Journal*).

BEST METHOD OF SEWAGE DISPOSAL FOR SMALL COMMUNITIES. By F. Wallis Steddart. (John Wright and Co., Bristol. 6d.)

A PRÉCIS OF THE ENGLISH LAW AFFECTING LANDLORD AND TENANT. By Laurence Duckworth. (Effingham Wilson. 2s.)

THE EXPERIMENTAL BACTERIAL TREATMENT OF LONDON SEWAGE. By Professor F. Clowes and A. C. Houston. (P. S. King and Son. 10s.)

GENERAL BUILDING NEWS.

THE SAVOY HOTEL EXTENSION.—The new buildings which give the Savoy Hotel a frontage on the Strand, and which have been constructed on the American system, have been practically completed. The hotel will, in future, have frontage and entrance on the Strand, and another on the embankment. The courtyard has been paved with indiarubber slabs, so as to insure quiet. On the right as one enters is the Savoy Theatre; on the left and front is the hotel. The left side is given up to a Parisian café. Part of the premises are to be devoted to flats, or residential suites. The architects were Messrs. Collcutt and Hamp, the woodwork in the entrance hall and the extension to the restaurant was entrusted to Messrs. Gillow and Co., and the whole of the sanitary work was carried out by Messrs. Doulton and Co. Next week we hope to give a fuller account of the new work.

CATHOLIC CATHEDRAL, LEEDS.—The new Roman Catholic Cathedral for the diocese of Leeds was inaugurated a few days ago. The site of the old cathedral and schools was required for a street improvement by the Leeds Corporation, who not only gave 46,000*l.* for the land, but made over the site for the new cathedral to the Catholic authorities, costing an additional 30,000*l.* The architect is Mr. J. H. Eastwood, of Kensington. The building

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was illustrated and described in our issues for March 9, and May 18, 1901. An illustration of the altar was given on October 31, 1903.

GORTLETTERA NEW CHURCH, IRELAND.—The new Church of St. Mary's, Gortlettera, was opened a few days ago. The church is cruciform, consisting of nave, transepts, and chancel. The nave is 60 ft. by 25 ft., and is lighted by six single-light windows—three on either side—with lancet heads. The transepts are lighted by similar windows—two on either side—and by a three-light window on the gables. The chancel is 25 ft. by 14 ft. The roof is covered with blue slates and red-crested ridge tiles. The sacristy is 17 ft. by 13 ft. Over the front entrance of the church is a rose window, and on either side of the entrance is a small single-light window, with cusped head, as also four-angle buttresses. The high altar is worked in Sicilian marble, with supports and carvings of statuary and coloured marble shafts. The set of candlesticks were supplied by Messrs. Gunning and Reynolds, Dublin, and the stations of the cross by Messrs. Coppestan, Dublin. The floor is laid with wood, and the walls internally are plastered and finished in Keane's cement. Mr. Fee, of Longford, was the contractor, and Mr. T. F. M'Namara the architect, Dublin.

ST. JOSEPH'S CHURCH, TERENURE, IRELAND.—The dedication of the new Roman Catholic Church (St. Joseph's), Terenure, took place on the 24th ult. The cost of the building has been about 20,000*l.*, which includes the cost of the high altar and of the furniture. The Church is complete with the exception of the tower and spire. It was built by Messrs. Meade and Son, from designs by Mr. W. H. Byrne.

CHURCH, SWANNINGTON, LEICESTERSHIRE.—The new chancel and restored portions of St. George's Church, Swannington, were dedicated on St. George's Day. The architect for the work was Mr. G. H. Fellowes Prynne, of London.

NEW WESLEYAN SCHOOL, SKELMANTHORPE, YORKSHIRE.—The foundation stones were laid recently of the new Wesleyan Sunday-school at Skelmanthorpe, Yorkshire. The new building will be 54 ft. by 29 ft. 6 in., with two classrooms on the same floor, and a large classroom on the first floor. There are also six existing class-rooms and a kitchen underneath the new school, with entrances on the same level as the chapel floor. The roof will be in pitchpine, ceiled at the collar beams, and covered with green Westmorland slates. Mr. Joseph Berry, of Huddersfield, is the architect, and the following are the various contractors:—Masons, Messrs. John Hollingworth and Sons, Cumberworth; joiners, Mr. Tom Blacker, Skelmanthorpe; plumbers, Messrs. W. France and Co., Honley; plasterer, Mr. John Hallas, Clayton West; slaters, Messrs. T. Longbottom and Sons, Lockwood; painters, Messrs. Dyson and Armitage, Skelmanthorpe; concreter, Mr. John Cooke, Huddersfield; heating engineers, Messrs. Brook, Hardcastle, and Watson, Huddersfield. The cost will be about 1,600*l.*

COMPLETION OF SOUTH-WESTERN POLYTECHNIC.—The formal opening on the 6th inst., by Earl Cadogan, of the new hall, classrooms, laboratories, etc., at the South-Western Polytechnic, Manresa-road, Chelsea, marks the completion of this institution within the original site. After a public competition, the designs of the late Mr. J. M. Brydon were selected, and the first portion of the institution was erected and opened for work in 1895. By the rapid growth of the institution this soon proved inadequate to the requirements, as, early in 1899, further sums being granted, and the conditions having materially changed, the Governing Body instructed Mr. F. G. Knight to prepare plans for additional classrooms, lecture theatre, laboratories, and other buildings. Contracts were then entered into, and have since continuously been undertaken for additions, finally culminating in the present contract for the erection of the large hall, 68 ft. 6 in. by 43 ft. 3 in., for the combined purpose of a public hall (for concerts or other entertainments), and the female students' gymnasium, with classrooms, lavatories, etc., adjoining, an advanced cookery classroom, bricklayers and plasterers' workshops, photographic laboratories, a new refreshment department, new boiler house for 300 n.h.p. boiler, erected by Messrs. Danks and Co., with Messrs. Greens' economiser, and Sturtevant's fan propeller. Extensions to the mechanical and electrical laboratories, new wiring shop, etc., etc. The general plan of the institution is a parallelogram, about 214 ft. by 187 ft., with the hall across the centre axis, with large internal areas on either side. A corridor, 8 ft. in width, is continued around the building on the ground and first floors, with the various laboratories, classrooms, etc., generally on the outer side. The difficulty of combining the hall for concerts, etc., and a gymnasium has been met by arranging for the quick and easy removal of all the apparatus for the latter, either into the roof or under the floor. Being also a public hall, the requirements of the London County Council have been met, and the building, as far as possible, has been constructed of fireproof material. All floors are of iron and concrete, with rock maple block flooring, except the hall, where maple batten flooring is laid on sleepers bedded in the concrete; the roof is of steel construction with metal lathing, and granitic silicon plastering. Fire mains, hydrants, etc., have been carried out by Messrs. Shand, Mason, and Co. The heating of the hall and the adjoining rooms and the original gymnasium is by a combined system of Plenum and natural ventilation, *i.e.*, fresh air is drawn in at the basement level and driven through ducts by a 40-in. electrically-driven fan over large batteries, entering the hall and other rooms at the floor level and extracted through or at the level of ceilings. The remainder of the institution is heated by the exhaust steam to radiators in all rooms, corridors, etc. This work has been executed by Messrs. Z. D. Berry and Sons. The piers in the side walls of the hall being reduced to the smallest possible dimensions to admit the greatest amount of window openings, the roof is constructed and carried by two trussed steel purlins, resting on the end walls, braced together at intervals, relieving the weight from side walls. This, with the whole of the constructional ironwork and concrete flooring, has been executed by Messrs. Dennett and Ingle. All the gymnasium fixtures have been made by English manufacturers; the joinery work by Messrs. S. Elliott and Sons, of Reading; ironwork by Mr. E. Goddard. The general contractor for the last contract has been Mr. A. A. Webber, of Mortimer-street, W., and Mr. W. Winteringham has acted as clerk of the works.

POLICE STATIONS, BIRMINGHAM.—On the 19th ult., at the Council House, Birmingham, Major J. Stewart, R.E., one of the inspectors of the Local Government Board, held an inquiry relative to the application of the City Council for sanction to borrow 7,000*l.* for the erection of a sub-police station at Lingard-street, Nechells; 1,322*l.* for the purpose of enlarging Duke-street police station, and 1,550*l.* for the purchase of property situate at the junction of Wright-road and Malthouse-lane with the Washwood Heath-road, for the purpose of a police station. The City Surveyor (Mr. J. Price), and the Building Surveyor (Mr. A. W. Lee) were amongst those present.

CAFÉ, HALIFAX.—Messrs. G. Webster and Sons have just extended their Silver-street café. As a result of the extension the seating accommodation has been increased to between seventy and eighty. The work has been carried out under the direction of Mr. Thomas Kershaw, architect. Messrs. Moss Bros. were responsible for the furnishings, and Messrs. J. Sunderland and Co. for the electrical fittings.

BATHS, DERBY.—The new Corporation baths have been erected from plans prepared by Mr. John Ward, the Borough Surveyor, the contractors being Messrs. Chattle, of Derby, and the clerk of the works Mr. W. C. Gardener. The building is of red brick with stone facings. The large swimming bath is 100 ft. long and 30 ft. wide, and will hold 96,000 gallons of water. The building is illuminated by the electric light, the work of Messrs. Newton Bros. Mr. Buxton has been responsible for the painting. The suite of rooms, in addition to the caretakers' apartments, include a committee room, pay offices, superintendent's room, etc.; whilst in winter a special flooring can be put down, and the large bath-room used for dancing, etc. There are spare rooms at the end, which may be utilised as dressing or waiting rooms. There is also a refreshment room. A special feature is the Turkish bath. There is also a plunge bath, and a Russian vapour bath. Most of the walls are of glazed bricks, and teak is used in the woodwork. In the woman's department there are three first-class and five second-class baths, and on the men's side there are five first-class and twenty-three second-class baths, in addition to Harper baths. In connexion with the swimming bath there are sixty-eight dressing-boxes, including one double one. The engineering work was carried out by Messrs. Jerram and Co., Derby. The sub-contractors are as follows:—Masonry, A. Pinder, Derby; plumbing, Jerram and Co., Derby; tiling, W. Frost and Son, Derby; marble work, S. Tinkler, Derby; wrought ironwork and bells, Taylor, Whiting, and Taylor, Derby; stokery to hot rooms, T. Bradford and Co., Salford; steel roof trusses, A. Handyside and Co., Derby; staining and polishing, W. J. Betts and Son, Derby; mosaic floors, J. and H. Patteson, Manchester; parquetry floors, H. Bassant, London; tile paving, H. Owen, Derby; clocks, John Smith and Sons, Derby; iron staircases, Hayward Bros. and Eckstein, London; plastering, Albert Dakin, Derby.

INEBRIATES' HOMES, LANGHO.—The Inebriates' Homes, erected by the Lancashire County and Borough Councils at Langho, near Whalley, were opened recently. The elevations of the buildings are in the Queen Anne style, the facings being of Accrington red-pressed bricks, relieved with stone dressings, with roofs covered with light green Westmorland slates. The administrative buildings and dwellings are arranged round a quadrangle. The accommodation for inmates will be provided for in six blocks of semi-detached villas, connected with the administrative blocks by means of covered ways. Each house is complete in itself, accommodating ten persons, and containing a day-room, attendants' room, scullery, lavatory, bath, store, and boot-room, and separate single bedrooms throughout, due attention having been given in these buildings to the proper classification of inmates. The day-rooms have a southern aspect. The southern portion of the administrative buildings, facing the quadrangle, contains offices for the director, lady superintendent, clerk, committee, visiting-rooms, surgery, with other suites of rooms. Situated behind this office block is a dining hall, capable of seating 200 persons, the intention of the committee being that all inmates shall take their meals in the same room. Classification will be secured by means of screens that will be used to subdivide the room. The hall will also be used for recreation. On the south side there is a chapel. A building to the north-east of the administrative block will be used for boiler-house, and for electrical plant, laundry, water tower, and workshops. The buildings are in telephonic communication with each other, and the heating and ventilation is carried out on the Plenum system. The sewage will be dealt with by bacterial treatment, and tanks with a capacity commensurate to a population of 400 have been provided. The farm buildings are conveniently situated, and the roads leading to and from them are to be made suitable for all farm purposes. The buildings have been erected from the designs of the county architect, Mr. Littler. The clerk of the works was Mr. J. Kirkbride. The general contract has been carried out by Messrs. J. Gerrard and Sons, Ltd., Swinton. Messrs. Wood and Slacke, Blackburn, have been responsible for the electric installation; Messrs. Yates and Thom, Blackburn, have supplied the boilers; and the furnishing has been entrusted to Messrs. Kendal, Milne and Co., Manchester.

NEW ISOLATION HOSPITAL, CHISWICK.—The Chiswick Urban District Council have erected an Infectious Diseases Hospital at a cost of about 12,000*l.*, which was opened recently. The hospital is situated at the north-east end of Clayponds-lane, a portion of the grounds being in the Urban District of Brentford, and a portion in the Borough of Ealing. Immediately facing the hospital, on the west, is the Brentford Sanatorium, and a little to the north is the Ealing Hospital, which is about to be enlarged at an estimated cost of 15,000*l.* The site is rectangular in shape, three acres in extent, and has a gravel soil. The buildings, in order to get a proper fall for drainage into the Ealing Sewage Works, have had to be raised several feet above ground level, and the drains are laid under the footpaths which traverse the grounds. The sewage is discharged, by a specially-constructed sewer, direct into the Ealing Sewage Works. At the highest point of each soil drain is fixed an automatic flushing tank. The whole of the surface water drainage is conveyed to a deep concrete tank built on the south side of the laundry; thence it is pumped into a tank over the laundry and used for washing purposes. The site is surrounded by a boundary wall, 7 ft. high; the buildings are of stock bricks, with red dressings and slate roofs, and consist of the following:—Porter's lodge at the entrance gates at the western boundary—this is small, being only designed for the porter and his wife; reached by a carriage drive are the receiving-rooms, three in number, each about 12 ft. by 8 ft., the centre one containing a bath, connected by covered corridor to the administrative block, which consists of matron's bedroom, three nurses' bedrooms, three servants' bedrooms, linen and general stores, bathroom, etc., on the first floor, and medical officer's sitting-room (15 ft. square), laboratory (10 ft. 6 in. by 7 ft. 6 in.), dispensary (15 ft. by 7 ft. 6 in.), matron's sitting-room, and nurses' sitting-room (each about 15 ft. square), kitchen (17 ft. square), scullery (10 ft. square), larder (10 ft. by 6 ft.), and offices on the ground floor, all these rooms being 10 ft. in height. On the east side, connected by a covered corridor, is the scarlet fever block, which has two large wards, male and female (36 ft. long, 26 ft. wide, and 13 ft. in height),

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to receive six beds in each. These wards are fitted with centre stoves by Shoreland, with cold air inlet and flues under the floors. At the end of each of these wards is a paying ward (26 ft. by 12 ft. by 13 ft.), to accommodate two beds. Connected with these wards are lavatories, etc., the walls of which are lined with opalite tiling, and the partitions between water-closets, etc., are white enamelled slate, carried 6 ft. 6 in. above the floor. The floors consist of a deal sub-floor, lined with polished pitch-pine, secret nailed. The ventilation is by means of glass hoppers to each window, and air inlets on the floor line at the head of each bed, with Sheringham's ventilators at the ceiling. Between the two wards is a nurses' duty-room (about 14 ft. square), with observation windows looking into each ward. Standing in the entrance lobby to this pavilion is a portable bath, fitted with rubber wheels for the purpose of taking into the wards. On the north side of the administrative block, and connected with it by a covered corridor, is the probationary block. This contains two wards (24 ft. by 16 ft.), male and female, to accommodate two beds each, with lavatories, etc., at each end, and nurses' duty-room (13 ft. square) in the centre, with observation windows, etc. This pavilion has a verandah on the south side, and is fitted in a similar manner to the scarlet fever block. At the north-west corner of the ground are situated the laundry buildings, which consist of:—Disinfecting and pure room (each 12 ft. square), fitted with a Washington Lyons machine, engine-room, and boiler-house (14 ft. by 12 ft.), coal stores, wash-house (24 ft. by 19 ft.), etc., with washing machine, hydro extractor, wringer, and Ducoden ironing machine, washing tubs, rinsing tanks, etc. In the ironing-room is constructed a drying-chamber, heated by steam coil, and fitted with drying-horses on steel runners. On the north side of the laundry is the mortuary, fitted with enamelled slate post-mortem slab, with sinks and lavatory (hot and cold water supply), and benches for coffins, with a viewing lobby outside. The whole of the walls are covered with opalite tiling with circular angles. Adjoining is the ambulance shed, to accommodate two vehicles. As now usual in hospitals, there are no square angles throughout either of the pavilions, the junctions of the ceiling and walls and of the floor and walls, as well as the reveals and sills of the windows being all circular in section. The whole of the buildings are heated with hot-water radiators, which are supplied from heating chamber under the receiving-rooms, which contain two boilers, one for the hot water supply to sinks and lavatories, and the other for the radiators. In addition to the radiators, there are stoves in each of the rooms. The whole of the disinfecting and laundry machinery has been supplied by Messrs. Goddard, Massey, and Warner, Ltd., of Nottingham. The buildings are lighted with electric light throughout, supplied by the Ealing Corporation, and are all connected by telephone to the administrative block. The site was formerly an orchard, and in laying out the grounds, advantage has been taken of the opportunity to utilise a large number of good fruit-bearing trees for the purposes of the hospital. The grounds have been laid out under the supervision of Mr. S. T. Wright, the Superintendent of the Royal Horticultural Society's gardens, at Chiswick, and, when completed, will make the hospital an ideal and pleasant spot. The whole of the plans and specifications were prepared by Mr. Sydney Eydmann, under the supervision of the late surveyor (Mr. A. Ramsden), and the works have been executed under Mr. Eydmann's superintendence as architect. The quantities were supplied by Messrs. Morris Evans and Son. The buildings have been erected by Mr. Edwin Wall, of Lower Tooting, who has executed similar work on a much larger scale for the Metropolitan Asylums Board.

EXTENSION OF MOTOR WORKS, GUILDFORD.—The extension of the motor works of Messrs. Dennis Bros., Guildford, has now been completed. The extended premises have been erected from designs by Mr. John Lake, of Guildford, the contractors having been Messrs. Drowley and Co., of Woking. With the additional land acquired, the new buildings have cost 8,000*l.*, and the machinery has involved an expenditure of an additional 5,000*l.* A power elevator has been constructed, and will lift cars to any floor desired, both on the new extension and the old building. A stone staircase has been constructed by order of the authorities, which leads to all floors, while an air shaft has been placed between the two buildings, and as a further precaution in case of fire an outside iron staircase will be constructed.

THEATRE, LOUGHBOROUGH.—At the Loughborough Petty Sessions, on the 27th ult., Mr. R. S. Clifford, sen., renewed his application on behalf of Mr. John George Tindall Robertson for a full licence for a new theatre to be erected in Packe-street. Mr. A. E. King, architect and surveyor, produced the plans, which showed that accommodation was provided for 806 persons. There would be two bars. The magistrate granted the licence.

NEW HOSPITAL, MEXBOROUGH.—The foundation stone of the new Montagu Hospital, Mexborough, was recently laid. The new building, which stands on a site at the corner of Adwich-road and Cemetery-road, will be erected on the isolated buildings plan. In one pavilion will be two wards to accommodate ten and eight male patients respectively, and in the other pavilion a ward for eight women and children, in addition to which there will be an isolation ward and a small ward for two patients. The scheme also includes a separated operating room, with small ward attached, fitted up with surgical appliances and requisites, Board room, laundry, ambulance room, and suitable accommodation for the matron, nursing staff, and servants. The estimated cost of building and furnishing, exclusive of the land (valued at 750*l.*), is 8,000*l.* The architect is Mr. Knight.

NEW VILLAS, PURDYSBURN ASYLUM, IRELAND.—Two new villas have been erected in connexion with this asylum. The work has been carried out from the plans of Messrs. Graeme-Watt and Tulloch, the architects to the Asylum Board. Mr. Hutcheson Keith, of Belfast, was the builder.

DURHAM COLLEGE OF SCIENCE, NEWCASTLE-ON-TYNE.—The foundation stone of the front wing of the Durham College of Science, the construction of which will complete the building, has just been laid. The buildings now undertaken comprise the west front towards the Leazes, and the public lecture theatre behind it. This front will afford accommodation to the administrative department, and to the department of mathematics, geology, botany, natural history, agriculture, languages and literature, law, and possibly music. It will contain, also, the men's common room, the library, museum, Union Society's room, dining-room, and kitchen. The college buildings were originally designed by the late Mr. Robert J. Johnson, F.S.A., and Mr. W. H. Knowles, F.S.A., Newcastle, was selected to carry out the design. The extension comprising the present contract includes the principal wing and elevation, about 100 yards in length, towards the Leazes, and a large examination hall and lecture room, 70 ft. by 50 ft., lighted from the quadrangle. The buildings are to be of four stories in height, including the central tower 120 ft. to the parapet, which encloses the main entrance, opening into a hall 23 ft. in width. The principal's room is placed on the left of the entrance, with the Council room. Beyond is the junior staff room, and occupying the north-west angle of the block the Union room, 42 ft. square. On the right of the main entrance is the secretary's and porters' room, and contiguous thereto the clerks' office and an electrical engineering laboratory and mining laboratory. Opposite to the tower entrance is the grand staircase, and beyond it the large examination hall connected with the corridors on three sides. On the first floor is a library 60 ft. by 45 ft., lighted on two sides, and class-rooms for mathematics, literature, naval architecture, etc., and professors' rooms. On the second floor are class-rooms for languages, history and classics, and botanical laboratories, museum, and lecture room; and on the third floor, partially arranged in the roof, laboratories and museum for zoology. In the mezzanine are arranged ladies' cloak-rooms and lockers and the basement is occupied by dining-rooms for students and staff, lockers, etc. The warming and ventilation of each room will be effected on the steam atmospheric system, the upper portion of the tower being used for extract shafts. The elevations are to be of stone and red brick, and the roof covered with tiles. Large gables enclose the angle blocks on two sides, each to a height of 70 ft. The lowest stage of the tower comprises an open portico of Ionic columns, and above it is a series of orders surmounted by a pediment, and enclosing a projecting bay window. The floors are of fireproof construction, covered with pitch-pine flooring, and the dadoes are of oak, pitch-pine, and glazed brick. The contract, which amounts to 50,000*l.*, is being carried out by Mr. T. Lumsden, builder.

DRILL HALL, WALLSEND.—The foundation stone of the new drill hall of the 2nd V.B. Northumberland Fusiliers, which occupies a site in Lawson-street, Wallsend, was laid recently. The building will cover an area of 60 ft. by 40 ft. Mr. W. T. Weir, of Howdon, is the contractor, and the plans were prepared by Mr. M. H. Graham, architect, of Newcastle.

BUSINESS PREMISES, DUBLIN.—The new premises, 70 and 71, South George-street, Dublin, which have recently been rebuilt and enlarged have now been completed. The new building, which extends to the rear a distance of 160 ft., is four stories in height, and the frontage has been carried out in red brick with Tullamore moulded limestone dressings. The contractors were the Dublin Timber Company, the architect being Mr. G. T. Moore, of Dublin.

BUSINESS PREMISES, MERTHYR.—New business premises have been erected in Merthyr from the designs of Mr. Bruce Vaughan, architect, of Cardiff. The new buildings have a frontage to High-street of 112 ft., and to the Glebeland of 95 ft., and a depth of 86 ft. The work has been carried out by the contractors, Messrs. S. Shepton and Sons, of Cardiff. The cost of the work has been 12,000*l.*

STAINED GLASS AND DECORATION.

RUSHFORD CHURCH, NEAR THETFORD.—This church has been decorated by Messrs. Percy Bacon and Brothers, of London, who have also executed a reredos, with painted panels, a chancel screen in wood, the sanctuary hangings, altar rails, brass lectern, a three light stained-glass east window, brass memorial tablet, also wooden panelling all round the body of the church. They are also erecting a Lych gate in the churchyard. The work has been done for Mrs. Musker, of Shadwell-court, Thetford.

APPOINTMENTS.

OULTON.—At the meeting of the Oulton Urban Council held on the 27th ult., Mr. W. F. Cockrill was elected surveyor. The other candidates for the post were Mr. Alfred Clarke and Mr. H. C. W. Blyth.

CROYDON.—Mr. Burnett Bullock, of Bodmin, has been appointed a Building Inspector under the Croydon Rural District Council.

SANITARY AND ENGINEERING NEWS.

REFUSE DESTRUCTOR, WOLVERHAMPTON.—A refuse destructor has been erected at Wolverhampton for the Corporation. The destructor has been erected by Messrs. Manlove, Alliott, and Company, of Nottingham. The lavatory and water supply have been carried out by Mr. F. Lindsay Jones, of Wolverhampton; and the railings and gates have been supplied and fixed by Messrs. Bayliss, Jones, and Bayliss, also of Wolverhampton. The drainage work has been executed by the Sewage Department of the Corporation. Mr. Green is the Borough Engineer.

DRAINAGE SCHEME, HORSELL, SURREY.—At the meeting of the Horsell Parish Council held on the 28th ult., the committee appointed to consider the drainage scheme of Messrs. Elliott and Brown, of Nottingham, proposed to be carried out by the Chertsey Rural District Council, reported that they were of opinion that it was a satisfactory one. The estimated cost of the engineering works was 19,676*l.*, which would have to be obtained from the Public Works Loan Commissioners at 3½ per cent., repayable in thirty years.

RESERVOIR, CHELMSFORD.—A Local Government Board Inquiry was recently held in connexion with the Corporation's application for sanction to borrow 6,700*l.* for the construction of a covered service reservoir and a new 10-in. pumping main. The loan has now been sanctioned, and the work, which will be carried out under the supervision of the Borough Engineer, Mr. Cuthbert Brown, will be commenced forthwith.

MISCELLANEOUS.

THE NEW GAIETY THEATRE.—Mr. Arthur Franklin, as arbitrator, sat at the Surveyors' Institution, Westminster, on the 28th ult., in regard to the claim of the Gaiety Theatre Company (Limited) against the County Council. The company claim a sum of about 25,000*l.*, as the extra cost of the building which they erected under the Strand Improvement Scheme. It transpired that the County Council, in displacing the old Gaiety, offered the company a new site adjoining, and allocated a certain sum of money, about 50,000*l.*, to construct a new theatre. The expenditure upon the new building considerably exceeded that sum, and the theatre company contend that the outlay was necessary on account of the Council's requirements as to the architectural embellishments of the new building, which, occupying so important a site in the crescent designed under the improvement scheme should be of an imposing and ornate character. The contention of the County Council, who were represented by Mr. Harrison, K.C., was that the directors of the Gaiety Theatre Company exceeded the expense for their own purposes, desiring to enhance their property by a handsome architectural display. Mr. Hudson appeared for

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the Theatre Company. By the consent of the arbitrator, Mr. Hudson agreed with Mr. Harrison that the best course would be to adjourn the proceedings until next month, so that Mr. Norman Shaw, R.A., who was appointed by the Council as assessor in the matter of the general architectural design for the new crescent, should be able to attend to give evidence.

REREDOS, ARBROATH.—On the 23rd ult. in St. Mary's Episcopal Church, Arbroath, there was dedicated a memorial of the late Mr. James Muir, banker, who was at one time Provost of Arbroath. The memorial takes the form of a carved oak reredos and brass tablet. It is executed in selected British oak, and has been carried out in the studios of Messrs. Harry Hems and Sons, of Exeter.

SCOTTISH BUILDING TRADES' FEDERATION.—The half yearly meeting of the Scottish Building Trades' Federation was held in the Imperial Hotel, Aberdeen, on the 22nd ult., Mr. John Morgan, President, in the chair. Reports were submitted which showed that the state of trade was generally dull and depressed in almost every district throughout the country. Considerable discussion took place as to the proposed general conditions of contract, which have been adopted by the local Society of Architects on the lines of those prepared by the Royal Institute of British Architects, and suggestions were made as to modifications which seemed desirable to the meeting.

NEWCASTLE SOCIETY OF ANTIQUARIES.—At the last monthly meeting of the Newcastle Society of Antiquaries, Mr. Robert Blair read a note by Mr. H. T. Peirson, Lord Boyne's agent, on the discovery this month of an old burial on Brandon Hill, in Durham county. The discovery, it was stated, was made on April 14 by a quarryman working in the quarry on the highest point of Brandon Hill. It was 4 ft. below the surface, which at the place was quite level. There were no traces of a barrow. The discovery consisted of a cist, which was composed of four slabs of stone set on edge, with a covering stone. The cist was 5 ft. in length, and varied from 1 ft. 10 in. to 2 ft. 10½ in. in width. The cist contained a portion of a skeleton of an adult male, which was lying on the left side, with the head to the east and the knees doubled up. The skull was of a low type, with a very receding forehead. There was also found in the cist an earthenware vessel made of sun-burnt clay, and ornamented with punctured lines and a kind of herring-bone pattern alternately from top to bottom. Traces of fire were visible in the cist, and also on top of the covering stone. Photographs relating to the discovery were handed round.—*Newcastle Daily Chronicle.*

THE INSTITUTE OF ARCHITECTS AND L.C.C. DRAINAGE BY-LAWS.—The following Metropolitan Borough Councils, in addition to those mentioned in the *Builder* of April 2, have dealt with the circular letter sent out by the Secretary, Royal Institute of British Architects, calling attention to the by-laws made by the London County Council with regard to the deposit of plans, sections, and particulars of drainage works, submitting that a block plan as required by by-law No. 1 (5), with the levels and gradients properly marked thereon, shows everything that is necessary, that beyond this plan a written description of the pipes and apparatus below and above ground would be reasonable, and suggesting that the by-laws should be modified accordingly:—Marylebone Borough Council agrees with the proposals of the Institute of Architects. Wandsworth Borough Council has decided to inform the Secretary of the Institute of Architects that the block plan required by the by-law is all that the Borough Council insists upon, and that the written description mentioned in his letter is not considered necessary. Islington Borough Council, having consulted their engineer, agree with his opinion that the by-laws as they at present stand are both reasonable and necessary. Lambeth Borough Council resolved to forward the letter of the Secretary of the Institute of Architects to the London County Council, without comment. Shoreditch Borough Council simply made an order that the communication be received. Camberwell Borough Council directed that a copy of the report of the engineer upon the matter be sent to the Institute; this report is to the effect that that Borough Engineer only insists upon sufficient drawings being deposited to enable the local Public Health Committee to consider whether the whole of the suggested drainage is in accordance with the several Acts of Parliament; he thinks that this should be insisted upon, more especially as owners are now taking every advantage in claiming drains as sewers, where in the past the late vestries have not insisted upon the deposition of these full detailed plans.

LAW SOCIETY'S BUILDING, CHANCERY-LANE.—We are asked to say that the electric lighting in this building was done by Mr. Ernest E. Hankinson, not "Hankinson and Co." We gave the name of the firm as furnished to us by the architect.

HOUSING, MANCHESTER.—The Sanitary Committee of the Manchester Corporation state that the City Architect has been instructed to prepare plans for the erection on the Bradford-road area of seventy-eight cottages and a house and shop, and the plans and estimates have been submitted. The estimated cost is 16,350*l.*, plus 10,000*l.*, the City Surveyor's estimate for road forming and sewering. The committee have also determined to recommend the Council to exercise their powers for shop erections, and have directed the City Architect to prepare plans of six shops to be constructed in Victoria-avenue, on the Blackley estate. The estimated cost of these shops is 4,000*l.* A scheme was in April sealed by the Corporation for the provision of sixty-four tenement dwellings upon land situate in Rochdale-road, Sudell-street, and Moore-street. The Council are recommended to approve of and adopt the several housing and shop schemes referred to in this report, and to make application of the Local Government Board for their approval of the schemes and for their sanction to the borrowing by the Corporation of the sum of 23,050*l.*

FATAL FALL FROM A COPING.—An inquiry was held at Westminster Coroner's Court on Saturday last relative to the death of Freeman Harold Rigby, 50, a labourer, of 15, Union-street, Pimlico. William Dixon, a foreman builder, said that on Wednesday week he was superintending work at a house in Grosvenor-place, the deceased man being employed there. The witness gave him instructions to erect a scaffold on the principal staircase, and he required a ladder, which, at the time, was in Pembroke-mews, at the back of the premises. For the purpose of getting ladders into the house a hole had been made in some wire netting on a flat 21 ft. from the ground, and Rigby, instead of walking 200 or 300 yards round to the mews, walked along a coping only 5 in. wide, and fell through the hole. He was taken to St. George's Hospital, where death took place. He really lost his life through an imprudent act. The jury returned a verdict of "Accidental death."

RESTORATION OF TOYNTON CHURCH.—On Saturday last the Lord Bishop of Lincoln reopened the parish church of Toynton All Saints', near Spilsby, after restoration. The work has brought to light some unsuspected, but interesting, features. It had long been surmised that the south wall would reveal traces of Gothic arches, and upon removal of the whitewashed plaster an arcade was revealed of three bays, erected aparently in the XIVth century. There are two limestone pillars, octagonal in shape, but, somewhat strangely, standing on square bases. They have moulded capitals, very clearly cut, and are 6 ft. 6 in. high, and 10 ft. 6 in. apart. Two of the three arches are quite perfect, but one had been cut away in order that a window might be inserted to give light to a gallery at the west end. Interesting as this discovery was, it pales in importance before that which the north wall was found to reveal, where were found four bays, of about 9 ft. each, with three pillars and two half-pillars of the Norman style, and dating back to A.D. 1150, or some 200 years earlier that the south arcade. At some period or other this arcade had been subjected to fire. Plain traces of ornamental lettering have also been discovered, this practice of text-writing originating about A.D. 1550. The whitewash period came after this, and it was upon the removal of several coats of whitewash that the latter discovery was made. The first known patron was a Saxon, and it is also known that the Countess Lucy, A.D. 1083, and her descendants were patrons of this living up to the year 1281.—*Sheffield Telegraph.*

BRITISH FIRE-PREVENTION COMMITTEE.—The testing operations for the current session were recommenced on Wednesday afternoon at the British Fire-Prevention Committee's testing station in Bayswater, when two fire-resisting partitions, one of slabs and one of porous bricks, were under investigation for a protracted period at temperatures ranging to 1,800 and 2,100 degrees Fahr. The tests were attended by representatives of the Council and Executive of the Committee, and a number of district surveyors, insurance surveyors, municipal and government officials. Official reports on the result of the test will be shortly issued. The slabs and porous bricks were proprietary articles, submitted by Mr. Jabez Thompson, of Northwich. The record for fire-resisting partitions was beaten by this firm's "Brickwood" partition, which withstood a severe fire test up to 2,100 degrees Fahr. for four hours, followed by five minutes' stream of water from a steam fire engine. The slab partition test was for one and a quarter hours up to 1,800 degrees Fahr., followed by two minutes stream of water. The Sub-Committees in charge of the tests comprised Messrs. Marsland, Dicksee, and Grellier (district surveyors), Mr. Max Clarke, A.R.I.B.A., Mr. Langridge (insurance surveyor), and Chief Officer Dyer of the National Fire Brigades Union.

THE CITY OF LONDON DIRECTORY.—We have received a copy of the thirty-fourth annual edition of this excellent directory from the publishers, Messrs. W. H. and L. Collingridge, 148, Aldersgate-street, E.C. The work has been carefully revised under new editorial management, and has been corrected up to the time of going to press. All the information concerning the City Corporation, the committees, the City Officials, and the Livery companies, is given as usual. A new feature is the inclusion of the Tariff Commission, and the members selected to serve on its various committees. The alphabetical list contains the name, address, and trade or profession of every person or firm; and, as far as can be ascertained, of each individual member of a firm in the City of London. The Trades Guide is classified under the various trades or professions. The Biographical Section comprises portraits and biographies of the Aldermen and principal officers of the Corporation, and of many of the Masters of the Livery Companies. The Public Companies Section includes the important banking, insurance, financial, railway, and industrial companies, with names of directors, particulars of capital, and the latest procurable information as to dividends, etc. There have been several alterations in the streets of the City during the last twelve months, all of which have been recorded in the large coloured map, which forms one of the features of the work. The boundaries of the Wards and Parishes are marked, the former being indicated in colour. The price of the work is 12s. 6d.

ASFORDBY PARISH CHURCH.—Mr. H. L. Goddard, architect, who was requested by the rector to report as to the state of Asfordby Parish Church, has sent in a report, which was presented to a recent vestry meeting. He states that the wall facing where built in the local ironstone is much decayed, more particularly on the faces most subject to the prevailing winds and rains; of these the tower is in the worst state. The Ketton stone parapets, copings, and pinnacles are generally in good order, although buttress weatherings and string courses in some places require restoration. The chancel having been most recently restored, the facing is generally in better order than the remainder of the church, although there are parts where the local stone is much decayed and should be replaced with new. Of the whole fabric the tower has suffered most severely, in consequence of its height and greater exposure. Again this has affected the local stone facing only, the parapets, panelled frieze pinnacles, and spire being in really good order, with the exception of some parts of the pannelled frieze and string course over. The tower appears to have been cemented all over at some period with a view to arresting the decay of the local stone facing. This cement has almost disappeared except on the upper stage, where it remains fairly complete on all the faces. Any facing exposed on the north and east sides is decayed, but not to such an extent as that of the west and south sides, which are in the worst state, surpassed only by the condition of north-west and south-west buttresses, the condition of which is almost dangerous. The decay of the walling of the tower is not confined to the exterior; the interior of the bell stage has also suffered seriously, and the arches supporting the haunches of the spire are in part cracked and much weathered. For the stability and preservation of the church, he advises that as funds permit, the whole of the decayed local stone facing be replaced with Ketton stone from the Edith Western Quarries. The work can be done in sections as funds permit. The work on the tower, Mr. Goddard says, should be commenced at once, as the spire is endangered by the present condition of the substructure. He estimates the cost of the whole work of repair at about 1,000*l.*

CAPITAL AND LABOUR.

THE TEES-SIDE BUILDERS' DISPUTE.—At a meeting of joiners at Stockton on the 29th ult., it was agreed to accept ½d. per hour reduction, with an extra allowance of ½d. per hour or 6d. per day when laying block pitch pine or hardwood floors; walking time to be mutually arranged, and no further reduction for twelve months. These terms to come into force on May 9.

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Legal.

COLLS *v.* HOME AND COLONIAL STORES, LTD.

IN the House of Lords, before the Lord Chancellor and Lords Macnaghten, Davey, Robertson, and Lindley, this case was heard on Monday. It was an appeal from a judgment of the Court of Appeal reversing an order of Mr. Justice Joyce.

Mr. Bray, K.C., Mr. O. Leigh Clare, and Mr. Nutter (instructed by Messrs. Hyde, Tandy, Mahon, and Sayer) appeared for the appellant; while Mr. Haldane, K.C., Mr. Hughes, K.C., and Mr. W. E. Vernon (instructed by Messrs. Slaughter and May) were for the respondents.

The action, which raised an important question in the law applicable to the obstruction of ancient light caused by the erection of loftier premises on the site of an old building, was brought by the respondents, Home and Colonial Stores, Ltd., against Mr. Colls, the well-known builder and contractor, to restrain him from erecting a building in Worship-street, Finsbury, in such a way as to obstruct their ancient light. The building in question was opposite the premises of the respondent company, and was erected on the site of old buildings which had been pulled down. It was proposed to erect the new building to the height of 42 ft., the old building it replaced being but 19 ft. 6 in. The company complained that the proposed erection would seriously darken their premises and obstruct the amount of light formerly enjoyed by them. To that the appellant replied that the amount of light which would yet be left would be sufficient for the use of the company's premises for the ordinary purposes of habitation or trade, and that if, in fact, their premises were injuriously affected by the new buildings, all they were entitled to claim were damages and not an injunction. The company, however, refused to allow the matter to go to a reference on the question of damages, and stood upon their alleged legal right to an injunction. The important question, therefore, that the appeal raised was whether a mere diminution of light gave the party affected a right to an injunction, or merely a right to damages. Mr. Justice Joyce held that, although the new building would deprive the company of a substantial amount of light, causing them real damage, yet that as enough light would be left for the ordinary purposes of occupancy of the premises as a place of business, and its selling and letting value would not be affected, the company were not entitled to an injunction, though they might have been to damages.

The company from that judgment appealed, and meanwhile Mr. Colls went on and completed the new premises.

The Court of Appeal reversed the judgment of Mr. Justice Joyce, and ordered the pulling down of the building erected to such a point that the ancient light enjoyed by the company was not in any degree diminished, but they suspended the order for a mandatory injunction to issue until such time as Mr. Colls' appeal to the House of Lords had been heard and decided. The appeal was argued last summer before the Lord Chancellor and three Law Lords, mainly on the abstract question whether, when, by the erection of new premises a person's light to a substantial degree was interfered with, that person might insist on his right to refuse compensation, and require the Court to protect his right to ancient light by injunction, and the decision in Warren *v.* Brown decided in 1900 was discussed. That case was tried by Mr. Justice Wright, who held that the right to ancient lights acquired by statutory prescription was, except in special cases, limited to a sufficient quantity of light for all ordinary purposes of inhabitancy or business. The Court of Appeal reversed that decision, and the parties took the case no farther.

At the conclusion of the arguments judgment was reserved until the Michaelmas sittings, when the appeal was ordered to be re-argued, and the House was strengthened by the addition of two more Lords. At the conclusion of the arguments before a full House of six Law Lords (of whom the late Lord Shand was one), judgment was again reserved until Monday the 2nd ultimo, when judgment was delivered, allowing the appeal.

The Lord Chancellor, in moving that the appeal be allowed, said:—

My Lords,—In this case, which was tried before Mr. Justice Joyce, the learned judge gave judgment for the defendants upon the ground that the plaintiff had failed to prove any actionable wrong, although he found that the erection of the buildings of which the plaintiff had complained had appreciably diminished the light which the plaintiff has previously enjoyed.

The Court of Appeal, as I understand their judgment, thought this was wrong, and ordered a mandatory injunction to pull the premises down, so as to restore all the light that had been previously enjoyed. If this principle should be sanctioned by your Lordships it would be for the first time that, in this House at all events, such a principle had been determined.

My Lords,—I do not deny that authorities may be found for it, some of which have been cited at the Bar, but I do not think that the exact question which is now in debate has ever been brought before this House until now.

The question may be very simply stated thus:—After an enjoyment of light for twenty years, or if the question arose before the Act for such a period as would justify the presumption of a lost grant, would the owner of the tenement in respect of which such enjoyment had been possessed be entitled to *all* the light without any diminution whatsoever at the end of such a period?

My Lords,—If that were the law it would be very far reaching in its consequences, and so the application of it to its strict logical conclusion would render it almost impossible for towns to grow, and would formidably restrict the rights of people to utilise their own land. Strictly applied, it would undoubtedly prevent many buildings which have hitherto been admitted to be too far removed from others to be actionable, but if the broad proposition which underlies the judgment of the Court of Appeal be true, it is not a question of forty-five degrees, but any appreciable diminution of light which has been enjoyed (that is to say, has existed uninterruptedly for twenty years) constitutes a right of action, and gives a right to the proprietor of a tenement that has had this enjoyment to prevent his neighbour building on his own land.

My Lords,—I do not think this is the law. The argument seems to me to rest upon a false analogy, as though the access to and enjoyment of light constituted a sort of proprietary right in the light itself. Light, like air, is the common property of all, or, to speak more accurately, it is the common right of all to enjoy it, but it is the exclusive property of none. If the same proposition against which I am protesting could be maintained in respect of air the progressive building of any town would be impossible. The access of air is undoubtedly interfered with by the buildings which are being built every day around London. The difference between the town and the country is very appreciable to the dweller in cities, when he goes to the open country or to the top of a mountain, or even a small hill in the country, but would the possessor for twenty years of a house on the edge of a town be at liberty to restrain his neighbour from building near him because he had enjoyed the free access of air without buildings near him for twenty years? No doubt, this is an extreme case, but it is one of the extreme cases which tries the principle. The truth is, that though there were objections to ask a jury whether the enjoyment *talis qualis* was such that they might presume a lost grant when nobody supposed that such a grant ever really was made, yet it gave the opportunity of considering what was the extent of the supposed grant, and if anything so extreme as I have just supposed were claimed, no jurymen in their right senses would have affirmed such a grant. The statute upon which reliance is placed in this case illustrates the danger of attempting to put a principle of law into the iron framework of a statute. The statute literally construed by the use of the words "*the* light" would mean all the light which for twenty years has existed in the surroundings of the tenement which has enjoyed it; yet, singularly enough, there has been a complete uniformity of decision upon the construction of the statute that it has made no difference in the right conferred, but is only concerned with the mode of proof; but, though I quite concur with this construction, which is supported by an overwhelming body of authority, yet I cannot but think the language of the statute has led to some of the decisions which your Lordships are now called upon to review.

Certainly in the older decisions which have been brought to your Lordships' notice in Mr. Bray's very able argument, the proposition, which as I have said underlies the judgment of the Court of Appeal, finds no place.

Lord Hardwicke long ago in 1752 (Fishmongers' Company *v.* East India Company, 1 Dickens, 165), dealing with this very question, the alleged obstruction to light, laid down what I believe to be law to-day. "It is not sufficient," he said, "to say that it will alter the plaintiff's light, for then no vacant piece of ground could be built on in the City, and here there will be 17 ft. distance, and the law says it must be so near as to be a nuisance." Lord Cranworth, in Clark *v.* Clark, L.R., 1 Ch. 16, adopted the same test, and his observation, though a subsequent decision of his seems to throw doubt upon it, has received the assent of some of the most learned judges who ever sat upon the English bench.

I think that the whole subject has been confused by certain decisions which were dependent on the facts proved, and were cautiously reported as laying down principles of law, when they were, in my view, only intended to be findings of fact in that particular case. At all events, I am prepared to hold that the test given by Lord Hardwicke is the true one, and I do not think a better example could be found than the present case to show to what extravagant results the other theory leads. The owner of a tenement on one side of a street 40 ft. wide seeks to restrain his opposite neighbour from erecting a room, which, when erected, will not then be of the same height as the house belonging to the complaining neighbour, and the only plausible ground on which the complaint rests is that on the ground-floor he has a room not built in the ordinary way of rooms in an ordinary dwelling-house, but built so that one long room goes through the whole width of the house to a back wall, which has, however, no window at the back of it, too dark for some purposes without the use of artificial light even before the building on the other side of the street was erected.

I think that no tribunal ought to find as a fact that the building is a nuisance, and although apart from the inappropriateness of the remedy by injunction, I am of opinion that the plaintiff has no cause of action against the defendant. The test of the right is, I think, whether the obstruction complained of is a nuisance, and as it appears to me, the value of the test makes the amount of right required depend upon the surroundings and circumstances of light coming from other sources, as well as the question of the proximity of the premises complained of. What may be called the uncertainty of the test may also be described as its elasticity. A dweller in towns cannot expect to have as pure air as free from smoke, smell, and noise as if he lived in the country and distant from other dwellings, and yet an excess of smoke, smell, and noise may give a cause of action, but in each of such cases it becomes a question of degree, and whether in each case it amounts to a nuisance which will give a right of action.

My Lords,—I have not thought it necessary to enter into a discussion of the authorities, because I think it has been most carefully and accurately done by Mr. Justice Wright in Warren *v.* Brown, 1900, 2 Q.B. 722.

Of course, my Lords, it must be taken that the foundation of this judgment rests upon the finding of fact by Mr. Justice Joyce, that the buildings of the defendant had not so materially interfered with the light previously enjoyed by the plaintiff as to amount to a nuisance.

It follows that in my judgment the case of Warren *v.* Brown, by Mr. Justice Wright, was correctly decided, and ought to have been affirmed by the Court of Appeal. It was, however, reversed in accordance with the same views which guided that court in the case now under view.

For the reasons I have given, I have to move your Lordships that the judgment of the Court of Appeal be reversed, and the judgment of Mr. Justice Joyce restored, and that the respondents do pay to the appellants the costs both here and below.

Lord Macnaghten, My Lords,—The right of an owner or occupier of a building with windows in it, privileged as ancient lights, in regard to the protection of the light coming to those windows is a purely legal right. It is an easement belonging to the class known as negative easements. It is nothing more or less than the right to prevent the owner or occupier of an adjoining tenement from building or placing on his own land anything which has the effect of illegally obstructing or obscuring the light of the dominant tenement. This right in early times was vindicated (see Baten's Case, 9 Rep. 546) by an action on the case for nuisance, in which damages might be recovered and judgment had for removal or abatement of the nuisance. In Alfred's Case (9 Rep. 576) Lord Coke says that an action lies for nuisance done to light as one of the three essential requisites of habitation. "An action lies," he says, "for hindrance of the light, for the ancient form of the action was significant, *scilicet*—*quod messuagium horridâ tenebritate obscuravit.*" It was not every diminution of light that would support such an action. The form of the action itself shows

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that. In later times when an action for the protection of ancient lights came to be regarded rather as an action for disturbance of an easement than an action grounded on nuisance—as an action to prevent the infringement of a right rather than an action to redress a wrong—the necessity of showing the gravity of the injury complained of was not so obviously apparent. Still the principle was the same, and it must always be the same. "It is not sufficient," as Lord Hardwicke observed in The Fishmongers Company *v.* The East India Company (1 Dickens, 163), "to say it will alter the plaintiff's lights . . . The law says it must be so near as to be a nuisance."

Probably the most satisfactory statement of the rule to be applied in all cases of ancient lights is to be found in Back *v.* Stacey (2 Car. and P., 465), and Parker *v.* Smith (5 Car. and P., 438). Back *v.* Stacey was an issue directed by the Lord Chancellor to try two questions: (1) whether the ancient lights of the plaintiff in his dwelling-house in Norwich had been "illegally" obstructed by a building of the defendant, and (2) if so, what damage the plaintiff had sustained in respect of the injury. So that if the jury had found that the obstruction complained of was an illegal obstruction the damages would have gone to the whole of the injury and not merely to the loss sustained up to the date of the writ. It was contended there that as it was evident that the quantity of light previously enjoyed had been diminished the plaintiff was at any rate entitled to a verdict on the first issue, any obstruction of ancient lights being illegal.

But according to the report, "Best, C.J., told the jury, who had viewed the premises, that they were to judge rather from their own ocular observation than from the testimony of any witnesses, however respectable, of the degree of diminution which the plaintiff's ancient lights had undergone. It was not sufficient, to constitute an illegal obstruction, that the plaintiff had, in fact, less light than before; nor that his warehouse, the part of his house principally affected, could not be used for all the purposes to which it might otherwise have been applied. In order to give a right of action, and sustain the issue, there must be a substantial privation of light, sufficient to render the occupation of the house uncomfortable, and to prevent the plaintiff from carrying on his accustomed business (that of a grocer) on the premises, as beneficially as he had formerly done. His lordship added, that it might be difficult to draw the line, but the jury must distinguish between a partial inconvenience and a real injury to the plaintiff in the enjoyment of the premises."

Back *v.* Stacey was determined in 1826. Parker *v.* Smith was heard during the sittings after Michaelmas Term, 1832. It is, I think, the earliest reported case dealing with the question of light after the passing of the Prescription Act, which came into operation on the first day of Michaelmas Term, 1832. It was tried before Tindal, C.J. The marginal note states accurately, I think, the effect of the decision in these words: "That diminution of light and air which the law recognises as the ground of an action against a party who builds near another's premises is such as really makes them to a sensible degree less fit for the purposes of business or occupation."

It does not seem to have been suggested either by the Counsel of the Judge that the Prescription Act had made the slightest alteration in the nature of the right to light or the principle on which the question of an alleged infringement of that right ought to be determined.

To these two cases I would only add the case of Wells *v.* Ody (7 Car. and P., 410) before Parke, B., in 1836. In his charge to the jury the learned Judge said that he entirely adopted the law as laid down by Tindal, C.J., in Parker *v.* Smith. And then, after reading a passage from Parker *v.* Smith, he concluded his address to the jury by saying:—"The question therefore which I shall leave to you is whether the effect of the defendant's building is to diminish the light and air so as sensibly to affect the occupation of the plaintiff's premises and make them less fit for occupation."

So much for the right at law.

Courts of Equity had no original jurisdiction in the matter. Their province was simply to grant an injunction in aid of the legal right where there was danger of irreparable mischief or where an injunction was required to prevent multiplicity of actions. Under Lord Cairns' Act, 21 & 22 Vict., c. 27, the court was empowered, in all cases in which it had jurisdiction to entertain an application for an injunction against the commission or continuance of any wrongful act, to award damages to the party injured, either in addition to or in substitution for such injunction. The Act, commonly known as Sir John Rolt's Act, 25 & 26 Vict., c. 42, provided that in all cases in which any relief or remedy within the jurisdiction of the Court of Chancery was sought, whether the title to such relief or remedy was or was not incident to or dependent upon a legal right, every question of law or fact cognisable in a Court of Common Law on the determination of which the title to such relief or remedy depended, should be determined by or before the same court. These Acts are superseded by the Judicature Act, and now the High Court has all the jurisdiction of the Court of Chancery and of the several courts of law. But still, so far as the right in question is a legal right the court in the exercise of its jurisdiction must be guided by the principles established at law. And those principles, in my opinion, are still to be found most clearly and most concisely exhibited in the cases before Best, C.J., and Tindal, C.J., to which I have already referred.

Although the question thus stated appears tolerably simple it cannot be disputed that the reported cases on questions of light in recent times are not altogether consistent. There seem to be two divergent views, neither of which, I think, is absolutely accurate. The extreme view on one side is that the right which is acquired by so-called statutory prescription is a right to a continuance of the whole quantity of light which has come to the windows during a period of twenty years, This view is conspicuous in Calcraft *v.* Thompson, 15 W.R. 387, before Chelmsford, L.C., and in Scott *v.* Pape, 31 Ch. Div. 571, where Cotton, L.J., speaks of a "cone of light," and Bowen, L.J., of "a specific quantity of light" as the measure of the plaintiff's right.

The extreme view on the other side is that the right is limited to a sufficient quantity of light for ordinary purposes.

I think this divergence of view comes from a difference of opinion, consciously or unconsciously entertained, as to the meaning and effect of the provisions of the Prescription Act, 2 and 3 Will. IV. c. 71, and if I am not mistaken, it may be traced to certain expressions, not perhaps sufficiently guarded, which are to be found in Judgments delivered in this House in the case of Tapling *v.* Jones (XI. H.L. 290). In that case Lord Westbury, Lord Cranworth, and Lord Chelmsford, all assume that a period of twenty years' enjoyment of the access and use of light to a building creates an absolute and indefeasible right immediately on the expiration of the period of twenty years. No doubt section 3 says so in terms, but section 4 must read in connexion with section 3; and if the two sections are read together it will be seen that the period is not a period in gross, but a period next before some suit or action wherein the claim or matter to which such period may relate shall have been or shall be brought into question. Unless and until the claim or matter is thus brought into question, no absolute or indefeasible right can arise under the Act. There is what has been described as an inchoate right. The owner of the dominant tenement after twenty years' uninterrupted enjoyment is in a position to avail himself of the Act if his claim is brought into question. But in the meantime, however long the enjoyment may have been, his right is just the same, and the origin of his right is just the same as if the Act had never been passed. No title is as yet acquired under the Act. This point seems to have been much discussed shortly after the Act was passed. It was finally settled in a series of cases at Common Law, beginning, I think, with Wright *v.* Williams, 1 M. and W. 77, and including Richards *v.* Fry, 7 Ad. and E., 698, and Cooper *v.* Hubbuck, XII. C.P., N.S., 456, in which there is an interesting controversy between Willes, J., and Williams, J., on the question whether the twenty years' uninterrupted enjoyment under the third section is the period of twenty years before any suit or action or twenty years before each suit or action in which the point may from time to time arise. The former construction, in which Erle, C.J., and Byles, J., concurred with Willes, J., eventually prevailed.

The question is of little or no practical importance. But the construction established by the series of decisions to which I have referred, in accordance with the express language of the statute, goes, I think, a long way to show that the view taken by James, L.J., Mellish, L.J., and Lord Selborne as to the effect of the Act is absolutely correct, and that the qualification suggested by Bowen, L.J., in Scott *v.* Pape, 31 Ch. D. 571, is not well founded. It certainly would be strange if the court had been compelled to hold that the Prescription Act confers upon a person whose right is questionable, at least to this extent that it has been actually brought into question, a higher and a larger right than that possessed by a person whose prescriptive claim to the enjoyment of light is so clear as to be beyond all question. I have, therefore, no doubt that the Prescription Act has not in the slightest degree altered the pre-existing law as to the nature and extent of the right of access of light or the principle on which it is to be determined in any particular case whether the right has been infringed.

Now, if this be so, it seems to me, in accordance with the opinion expressed by James, L.J., and Brett, L.J., in the Ecclesiastical Commissioners *v.* Kino, and by many other Judges, that the direction given by Best, C.J., in Back *v.* Stacey is the direction which a court exercising the functions of both Judge and jury ought to keep steadily in view.

My Lords, having come to this conclusion, I do not propose to trouble your Lordships with any comments upon the mass of cases by which in comparatively modern times the question has been elucidated or obscured. It is enough, I think, to refer to what was said in Kelk *v.* Pearson (L.R. VI. Ch. 809), The City of London Brewery Company *v.* Tennant (IX. Ch. 212), and the Ecclesiastical Commissioners *v.* Kino (XIV. Ch. Div. 213). Speaking for myself, I doubt very much whether it is a profitable task to retry actions which depend simply on questions of fact or to review and endeavour to reconcile or distinguish a number of cases that naturally enough contain some statements which, taken by themselves and apart for the context, may seem to be contradictory, but which must all proceed upon the same principle. It would only be another link in the embarrassing chain of authority, or if I may venture to say so, only another handful of dust to be cast into one scale or the other when the claims of opposing litigants come to be weighed in the balance. I think there is much good sense in the observations of Brett, L.J., in the Ecclesiastical Commissioners *v.* Kino:—"To my mind," said his Lordship, "the taking some expression of a Judge used in deciding a question of fact as to his own view of some one fact being material on a particular occasion, as laying down a rule of conduct for other Judges in considering a similar state of facts in another case, is a false mode of treating authority. It appears to me that the view of a learned Judge in a particular case as to the value of a particular piece of evidence is of no use to other Judges who have to determine a similar question of fact in other cases where there may be many different circumstances to be taken into consideration."

If I may trespass for a few minutes longer on your Lordships' attention, I would rather spend the time in making one or two practical suggestions. I do not put them forward as carrying any authority. But they may possibly be of use to those who have to try such questions as this, if and so far as they appear to be consistent with good sense.

It will be observed that in Back *v.* Stacey the learned Judge told the jury who had viewed the premises that they were to judge rather from their own ocular observation than from the testimony of any witnesses, however respectable, of the degree of diminution which the plaintiff's ancient light had undergone. Now, a Judge who exercises the functions of both Judge and jury cannot be expected to view the premises himself, even if he considers himself an expert in such matters. But I have often wondered why the Court does not more frequently avail itself of the power of calling in a competent adviser to report to the Court upon the question. There are plenty of experienced surveyors accustomed to deal with large properties in London who might be trusted to make a perfectly fair and impartial report, subject, of course, to examination in Court if required. I am not in the least surprised that the plaintiffs in the present case objected to a report from a disinterested surveyor, but, in my opinion, the Court ought to have obtained such a report for its own guidance.

Then, with regard to giving damages in addition to or substitution for an injunction—that, no doubt, is a delicate matter. It is a matter for the discretion of the Court, and the discretion is a judicial discretion. It has been said that an injunction ought to be granted when substantial damages would be given at law. I have some difficulty in following out this rule. I observe that in some cases juries have been directed to give 1s. damages as a notice to the defendant to remove the obstruction complained of. And then, if the obstruction was not removed, in a subsequent action the damages were largely increased. In others a substantial sum has been awarded, to be reduced to nominal damages on removal of the obstruction. But the recovery of damages, whatever the amount may be, indicates a violation of right, and in former times, unless there was something special in the case, would have entitled the plaintiff, as of course, to an injunction in Equity. I rather doubt whether the amount of the damages which may be supposed to be recoverable at law affords a satis-

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factory test. In some cases, of course, an injunction is necessary—if, for instance, the injury cannot fairly be compensated by money; if the defendant has acted in a high-handed manner; if he has endeavoured to steal a march upon the plaintiff or to evade the jurisdiction of the Court. In all these cases an injunction is necessary, in order to do justice to the plaintiff and as a warning to others. But if there is really a question as to whether the obstruction is legal or not, and if the defendant has acted fairly and not in an unneighbourly spirit, I am disposed to think the Court ought to incline to damages rather than to an injunction. It is quite true that a man ought not to be compelled to part with his property against his will, or to have the value of his property diminished, without an Act of Parliament. On the other hand, the Court ought to be very careful not to allow an action for the protection of ancient lights to be used as a means of extorting money. Often a person who is engaged in a large building scheme has to pay money right and left in order to avoid litigation, which will put him to even greater expense by delaying his proceedings. As far as my own experience goes, there is quite as much oppression on the part of those who invoke the assistance of the Court to protect some ancient lights which they have never before considered of any great value as there is on the part of those who are improving the neighbourhood by the erection of buildings that must necessarily to some extent interfere with the light of adjoining premises.

The common form of injunction which has been in use since the case of Yates *v.* Jack is not, I think, altogether free from objection. I think it would be better that the order, when expressed in general terms, should restrain the defendant from erecting any building so as to cause a nuisance or illegal obstruction to the plaintiff's ancient windows, as the same existed previously to the taking down of the house which formerly stood on the site of the defendant's new buildings. If the action is brought to a hearing before the defendant's new buildings are completed, and there seems to be good ground for the plaintiff's apprehensions, an order, I think, might be conveniently made in that form, with costs up to the hearing, and liberty to the plaintiff within a fixed time after completion to apply for further relief by way of mandatory injunction or damages as he might be advised.

With the present case I may deal very briefly. It cannot be disputed that some diminution of light is caused by the defendant's buildings, but such as it is I think it is exactly what Best, C.J., described as partial inconvenience rather than serious injury. I am satisfied that if the case had been tried at law before the question was so much embarrassed by the multiplicity of decisions no jury would have given any damages.

Perhaps I ought to add a word about Warren *v.* Brown, which is referred to in both the Judgments below. I cannot say that that case is quite satisfactory to my mind either as dealt with in the Court of First Instance or in the Court of Appeal. In the Court of First Instance the learned Judge who tried the case found a special verdict which is not very easy to understand. The room in which the light has been materially diminished "in its present state is," he says, "better lighted than the ground floor front rooms in many of the principal streets." I do not see what bearing that fact had on the question at issue. Then, instead of keeping in view the direction which Judges over and over again have said ought to be kept in view, the learned Judge embarks on an inquiry to determine which of two extreme views is correct. I doubt whether either the one or the other can be accepted as a safe guide without qualification. The Court of Appeal, in their turn, instead of dealing with the facts of the case before them, combat a particular view which rightly or wrongly they attribute to Wright J. I do not think Warren *v.* Brown helps one much.

I think the Appeal ought to be allowed with costs here and below.

[We hope to print the remaining Judgments next week.]

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

4,052 of 1904.—J. D. BENNET: *Enclosed Desks for School, and like uses.*

This invention has for its object to provide an enclosed desk of simple construction which may be conveniently shipped in parts and put together at its destination without the aid of skilled labour. For that purpose the desk is composed of end frames of cast-iron or other metal, having suitable grooves formed on their inner sides in such wise that a bottom board or boards may be slipped in horizontally, and front and back boards may be slipped down thereinto on suitably-grooved end boards, fitted into the frame while the usual counter and hinged lid are fitted on top to complete the desk, which is secured on to end standards (on which the frames rest) by screws or bolts.

4,479 of 1904.—J. H. SMITH and G. R. SACKETT: *Flushing Apparatus for Water-closets, and the like.*

A flushing apparatus, comprising a syphon having an air chamber in its crown, communicating with the upper end of its shorter leg, and sealed against communication with the longer leg, means for displacing the air cushion, to start the syphon, a tube communicating with said air chamber and extending therefrom downwardly to a point above the entrance to the syphon to break the syphon, the said tube being adjustable to vary its lower end relatively to the entrance to the syphon.

9,975 of 1903.—T. CAINK: *An Apparatus for Facilitating the Apportioning of the Cost of Private Street Improvements to the various Frontages.*

This apparatus consists of two sets of scales drawn on cardboard, one set placed horizontally, and the other obliquely, the zero of the scales meeting at the angle where the scales join one another. To the cardboard is fixed a straight-edge, placed below the horizontal scale. The remaining part consists of a set-square, the arm of which is pivoted stiffly so as to be adjustable to any angle. The arm has preferably a celluloid edge with a line scribed down the centre on the underside. The horizontal scales are scales of length, and the oblique scales, scales of money. The length scales are preferably divided into tenths, and the oblique scales into pounds, shillings, and pence. The instrument is used in the following manner:—In apportioning the cost of street works, the amounts are fixed in proportion to the extent of frontage of the various properties joining the street. Having ascertained the total cost and the total frontage (which preferably has been measured by a tape divided into tenths), the cost of some length within the range of the scale is ascertained.

11,496 of 1903.—H. JUBB: *Steam Excavators.*

An excavator for cutting trenches, and for other similar or suitable purposes, which consists in controlling and regulating the cut or bite of the bucket by means of suitable gearing and shafts, supported by the jib and pillar, said mechanism being connected with, and controlled by, the ordinary brake-shaft pulley and treadle.

4,409 of 1904.—J. J. FEELY: *Slaked Lime and Process of Preparing the same.*

A process of treating lime, which consists in slaking lime to a powdered or granulated condition in a chemical solution of acetic acid and water, drying said lime by the action of attrition, assisted by the chemicals in said chemical solution, and finally, in grinding said slaked and dried lime, chemically prepared, to a still finer powdered form.

4,606 of 1904.—R. LIEBOLD: *Process for Manufacturing Cement.*

The manufacture of cement, consisting in adding to each hundred kilogrammes of calcined, but unground, cement, about 10 litres of boiling water containing, approximately, 245 grammes stearine, 12 grammes of potash, and 10 grammes of colophony, the mass thus obtained being dried and subsequently ground.

6,816 of 1903.—G. T. MAWSON: *Suspension of Centres for the Construction of Arches.*

The object of this invention is an improvement in the suspension of centres upon which arches of concrete or masonry are turned in a framework of rolled metallic beams. The invention applies particularly to centres of sheet metal which are liable to be used between beams or joists whose spacing may vary, and therefore demands an adjustment. The plates of sheet metal forming the centres are given the necessary curvature, and are fitted with suspending hooks, which seize the lower flanges of the joists or beams and support the centre plate. These hooks, in order to accommodate the variation of space that may occur among joists of the same nominal spacing, are made adjustable so as to accommodate differences such as continually occur in the construction of floors and roofs of masonry laid in frames of metal.

9,959 of 1903.—W. CRAWFORD: *Fireproof Doors and Door Frames.*

According to this invention, the door is formed of a solid plate of metal which may be hung or supported on rollers, or otherwise, so as to be readily closed, or to be self-closing, and the door frame is made also of metal, which may be cast, or otherwise formed, with inwardly-projecting flanges to form a U-shaped groove along the top, bottom, and one end of the door frame, into which groove the door is adapted to fit closely. On the fourth side or end the door frame is formed with a groove or recess on its outer side, so placed that the outer edge of the door, which is bent over or returned, enters said recess in the door frame when the door is closed. A closed joint is thus formed around the four sides of the door to prevent the passage of flame, and, the door and frame being engaged all round the door edges, warping is not liable to occur, the arrangement being such as to allow of the expansion of the door while subjected to heat.

12,676 of 1903.—G. T. RICHARDSON: *Method of Actuating Door and Window Openers, Bolts, Locks, and the like.*

This invention relates to means for actuating door and window openers, bolts, and locks, and it consists essentially in the combination with a sliding bar or plate, having a series of teeth or pins upon it, of a revolving plate or disc provided with a spiral flange or thread, designed to engage on one side of the centre of the disc with the teeth, or the like, upon the bar or plate.

12,887 of 1903.—F. POHLMANN: *Concrete, or Similar Girders.*

A concrete or similar girder, consisting in the employment of a metal beam having a lower thickened flange to take up the tensile stresses and web, so connected to the concrete as to take up the shearing stresses.

12,994 of 1903.—C. H. SIMKINS, C. HADLEY, and W. HADLEY: *Latching Bolts of Latches and Locks.*

A latching bolt of a latch or lock, formed with an auxiliary tongue or bar, which extends backwards from near the head thereof through a fixed abutment situated a considerable distance back within the case, and a spiral spring surrounding such tongue or bar, which is compressed between such abutment and an abutment of the bolt at the forward end of such tongue or bar.

20,590 of 1903.—D. E. BARNES: *A Silent Friction Clutch Applicable to Hoists, and other purposes.*

According to this invention, the use of both ratchet wheels and pawls are altogether dispensed with, and two pulleys with V-shaped grooves on their circumference are substituted in place thereof, and in connexion with each such grooved pulley a curved or cam-shaped lever is mounted above the pulley on one side of the centre thereof, so that it rests by its own weight on the grooved periphery of the wheel, so as to act as a noiseless brake in one direction only, but to leave the pulley free to revolve in the other direction without exercising any pressure whatever.

22,711 of 1903.—H. C. PRUCE: *Clamping or Gripping Attachments for use in Connexion with Casement and Window Stays, Fanlight and other Regulator Rods, and other Sliding or Adjustable Articles.*

Clamping or gripping attachments for use in connexion with casement and window stays, fanlight and regulator rods, and other sliding and adjustable articles, consisting of two parts having coincident eyes or holes, wherethrough the rod or article to be clamped is passed, one of the said parts carrying a screw, cam-lever, or equivalent device, which, when operated, acts upon the other part in such a manner that the two parts are separated or moved in opposite directions and made to grip the bar or article at separated points and on the opposite sides.

23,622 of 1903.—F. A. MURRAY and C. A. MURRAY: *A Mitre Box for Holding Mouldings, and the like, while being Mitred.*

This invention consists of a mitre box made of wood or metal in any or all its parts, and adapted to hold mouldings, and the like, whilst being mitred. It has a base of any desired length and width, with sides parallel and ends parallel to each other respectively. At any given distance apart and parallel with these sides are four pieces of material, rebated so that any two placed together upon the base form an inverted T-shaped groove. These pieces are fixed firmly by screws, or any other ways, to the base and parallel with its sides. The T-shaped grooves allow of four T-shaped sliding fences, of equal sizes in any respect, to slide within them.

28,146 of 1903.—A. CLARK: *Collapsible Gates, Shutters, Window-guards, and the like.*

A collapsible gate, or the like, consisting of a lattice structure of pickets and lazy tongs provided with extensions and arranged so that the spaces enclosed by the lazy tongs and extensions are of practically the same size, except at the edges of the gate, and the apices

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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or corners formed by the overlapping ends of the extensions of one set of lazy tongs interlace and lie within the corners of the overlapping ends of the extensions of another set or partial set of lazy tongs.

55 of 1904.—J. P. ALTREE and C. F. G. BOYES: *Lined, or Otherwise Decorated, Portions of Enamelled Metal Surfaces, and the Method of Producing the same.*

This consists in producing lined portions of convex decorated enamelled metal surfaces, by first removing the groundwork enamel therefrom by the aid of an encircling guide, or of a ruler with convex or hollow inner or under surface, and subsequently painting over the hollows thus produced with enamel or colour of the tint desired.

2,944 of 1904.—P. KUPELWIESER: *Windows with Sliding Sashes.*

A window with sliding lower sash, consisting in constructing such sash of two separate parts, the upper part having a greater height than the lower part, both of which lie in one and the same plane and close together, with a butt joint situated at a level not interfering with the free view of a person standing or sitting behind the window, the two parts being connected together by supporting devices by means of bands passing over guide pulleys so that while the upper part is pushed upward, the lower part can sink downward, so as to form an opening between the two.

5,078 of 1904.—J. CRUICKSHANK and C. S. BURNHAM: *Elevators.*

Safety appliances for elevators, consisting of the car, a movable dog carried thereby, the vertical rod secured in the elevator-shaft adjacent to the path of the car, the retarder thereon to be engaged at the proper time opposite the dog, the rotary cam, with intermediate connexions for controlling the position of said dog, and enabling it to pass said retarder when the car is travelling at a safe speed, and means for rotating said cam in harmony with the movement of said car.

5,452 of 1904.—O. HERZOG: *Sliding Windows:*

Means for raising and lowering windows, and the like, comprising a sliding sash, a lazy-tong arrangement pivotally secured to the sash and a fixed resistance respectively, and means for operating said lazy tongs, comprising a bell-crank lever, pivoted to a rigid crossbar, a draw-bar jointed to the shorter arm of said bell-crank lever, and short links jointed to said draw-bar, and the two lowermost members of the said lazy tongs respectively, and means for temporarily securing the longer-handled arm of said bell-crank lever in the desired position.

8,174 of 1903.—W. C. EDWARDS: *Panel Construction for Partitions, Wall Linings, Door, and other Wooden Structures.*

A panel construction, having in combination a stile, made sufficiently thick to receive panel material, and cut away on one face at intervals to receive a rail of approximately the same width and depth as the spaces so cut away, whereby the outer faces of both members are approximately on the same plane.

14,811 of 1903.—C. PAYNE: *Apparatus for Indicating the Quantity of Water in Vessels, such as Tenders and Cisterns.*

An apparatus for indicating the quantity of water in a vessel, consisting in the combination of a main tube, open at its lower end to the water in the vessel, and provided with a valve at the said end, a chamber at the upper end of the tube, in communication with the tube by means of orifices, surmounted by cones, a pressure-gauge in communication with the chamber, and auxiliary means for supplying the main tube with air.

15,666 of 1903.—H. J. RABONE: *Joints of Measuring Rules.*

This relates to measuring rules, and consists in making on the inner faces of the outer or side plates of the knuckle joint projecting collars or flanges, and making in the middle part seats for the said collars or flanges, so that when the parts are secured together by the rivet-like joint pin, they have a bearing partly on the said joint pin and partly on one another.

5,120 of 1904.—J. N. DAGOS: *Iron Framing or Skeleton Work Employed in Concrete Construction.*

Iron framework or skeleton work for concrete construction, in which the bars are adapted to be set at any desired angles, and then secured by means of plates arranged at the junction points, and connected by screws, rivets, or the like.

5,299 of 1904.—G. F. STRAWSON: *Means for Glazing the Roofs of Glass-houses or other Structures.*

Means for glazing the roofs of glass-houses and other structures, comprising an outer projecting strip of metal straddling the supporting bar for the glass, and the edges of which strip bear against the edges of said glass, and a metal clip straddling the first strips at their point of juncture, and the ends of which press firmly against the upper surface of the glass, the clip being held in position by means of wedges or nails passing through holes formed in the vertical member of the supporting bar and the walls of the strip.

5,523 of 1904.—M. MANKE and P. KLAU: *Concrete and like Roofs and Ceilings.*

Concrete, stone, and like roofs and ceilings, provided with fixed tie-rods, having the characteristic feature that pieces are driven in between the tie-rods, which are bent about the flanges of the roof or ceiling girders, and the end sides of the flanges, these pieces serving both to tighten the tie-rods and keep them in the right direction, and also to hold the ends of the tie-rods at such a distance below the end surface of said flanges that a good holding surface for the coating of cement is thereby secured.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 20.—By MANSELL & ROWE.

Norwood.—103, Gipsy-hill, u.t. 61 yrs., g.r. 13*l.* 10s., y.r. 100*l.*	£900

By MORLEYS'.

Chiswick.—17, 19, 21, and 23, Gainsborough-rd., f., y.r. 168*l.*	2,500

By EGGINGTON & SON (at Bracknel).

Binfield, Berks.—Rounds-hill, "Ramslade House," also house, homestead, etc., adjoining area 14 a. 1 r. 38 p., f.	1,525
Freehold cottage and 14 a. 3 r. 22 p., f.	550
"Pollard Row Wood," 13 a. 2 r. 19 p., f.	925
Freehold house and premises, y.r. 20*l.* 9s.	335
Freehold house (s.), bakehouse and cottage, y.r. 24*l.*	425

April 21.—By H. J. BLISS & SONS.

St. George's East.—22, 23, and 24, Wellclose-sq., u.t. 17 yrs., g.r. 65*l.*, w.r. 245*l.* 14s.	455
Bethnal Green.—19, Ellesmere-rd., f., w.r. 36*l.* 8s.	530
Bow.—92, Hewlett-rd., f., w.r. 33*l.* 16s.	425

By GLASIER & SONS.

Brondesbury.—45, Streatley-rd., u.t. 85½ yrs., g.r. 8*l.* 8s., y.r. 50*l.*	515

By PERFECT & SONS.

Caledonian-rd.—No. 547, u.t. 50 yrs., g.r. 10*l.*, y.r. 55*l.*	545
Holloway.—7 and 9, Queensland-rd., u.t. 29½ yrs., g.r. 12*l.*, y.r. 76*l.* 14s.	325

By NEWBON, EDWARDS, & SHEPHARD.

City-road.—6, 7, 8, and 9, Haverstock-st., u.t. 20 yrs., g.r. 20*l.*, y.r. 144*l.*	770
Barnsbury.—57 and 59, Muriel-st., u.t. 41 yrs., g.r. 8*l.*, q.r. 84*l.*	780
Highbury.—227, Blackstock-rd. ("Sandringham Coffee and Dining Rooms"), u.t. 66½ yrs., g.r. 8*l.* 8s., v.r. 65*l.*	770
Holloway.—25, Yerbury-rd., u.t. 63 yrs., g.r. 7*l.*, y.r. 49*l.*	500
Stoke Newington.—4, Sandbrook-rd., u.t. 60 yrs., g.r. 5*l.*, y.r. 28*l.*	315
Kentish Town.—3, 5, and 7, Hampshire-st. (s.), u.t. 42½ yrs., g.r. 12*l.* 12s., y.r. 94*l.*	590

By J. A. & W. THARP.

Manor Park.—8, Rabbitts-rd., f., e.r. 33*l.* 16s.	320
East Ham.—28, Wordsworth-av., f., w.r. 26*l.*	290
Ilford.—52, 54, 56, and 60, Wilton-rd., f., w.r. 92*l.* 6s.	880
62, Wilton-rd. (s.), f., y.r. 30*l.*	420

By STIMSON & SONS.

Haggerston.—Cester-st., etc., f.g.r. 18*l.*, reversion in 73½ yrs.	420
Bethnal Green.—Great Cambridge-st., f.g.r. 6*l.*, reversion in 77 yrs.	160
Clapton.—Presburg-st., f.g.r. 15*l.*, reversion in 79 yrs.	330
Forest Gate.—Cranmer-rd., f.g.r. 12*l.*, reversion in 78 yrs.	320
Leytonstone.—Ferndale-rd., f.g.r. 8*l.*, reversion in 78 yrs.	210
Wanstead.—Hall-rd., f.g.r. 15*l.*, reversion in 89 yrs.	320
East Ham.—Telham-rd., f.g.r. 25*l.*, reversion in 79 yrs.	540
Edmonton.—Ann's-cottages, f.g.r. 12*l.*, reversion in 78 yrs.	240
Southwark.—Coxon's-pl., f.g.r. 21*l.*, reversion in 77½ yrs.	480
Kennington.—St. Oswald's-pl., f.g.r. 24*l.*, reversion in 78 yrs.	525
Forest Hill.—Zetland-villas, f.g.r. 12*l.*, reversion in 78 yrs.	300
Greenwich.—Bell-st., etc., f.g.r. 12*l.* 10s., reversion in 76 yrs.	250
Wandsworth.—Wharf-rd., f.g.r. 21*l.*, reversion in 77 yrs.	480
Shepherd's Bush.—Gayford-rd., f.g.r. 6*l.*, reversion in 74 yrs.	155
Bow.—Burgoyne-rd., etc., f.g.r. 26*l.*, u.t. 46 yrs., g.r. 5*l.*	305
West Ham.—Union-rd., f.g.r. 35*l.*, u.t. 71 yrs., g.r. 15*l.*	280
Stratford.—Martin-st., etc., f.g.r. 28*l.* 15s., u.t. 53½ yrs., g.r. 20*l.*	115
Clapham.—Larkhall-la., f.g.r. 20*l.* 10s., u.t. 33 yrs., g.r. 8*l.* 10s.	160
Fulham.—Moore Park-rd., f.g.r. 8*l.*, u.t. 52 yrs., g.r. nil	130
Kentish Town.—Rhyl-st., f.g.r. 10*l.* 6s. 8d., reversion in 36½ yrs.	550
Weedington-rd., f.g.r. 2*l.*, reversion in 36½ yrs.	100
Wimbledon.—18, Delamere-rd., u.t. 85 yrs., g.r. 6*l.* 12s. 6d., y.r. 32*l.*	230
Herne-hill.—55, 57, and 59, Deronda-rd., u.t. 55 yrs., g.r. 22*l.* 1s., y.r. 120*l.*	915

April 22.—By W. ASHMOLE.

Barking, Essex.—66 to 86 (even), Linton-rd., f., w.r. 185*l.* 18s.	£1,530
34, King's-rd. (s.), f., w.r. 23*l.* 8s.	220
87 to 105 (odd), North-st., f., w.r. 166*l.* 8s.	1,515
Plaistow.—2 to 14 (even), Buxton-ter., f., w.r. 120*l.* 18s.	1,020
Ilford, Essex.—1 to 4, Rutland-ter., f., w.r. 70*l.* 4s.	670
1 to 4, Sylvan-cottages, f., w.r. 72*l.* 16s.	660
Barking, Essex.—147 to 155 (odd), North-st. (s.), f., y.r. 96*l.* 14s.	810
11, Broadway (s.), f., y.r. 50*l.*	1,250

By BEALE & CAPPS.

Lambeth.—93, 95, 97, and 99, York-rd. (s.), u.t. 19½ yrs., g.r. 43*l.* 1s., y.r. 205*l.*	2,150

By BISLEY & SONS.

Bermondsey.—114 to 124 (even), St. James's-rd., u.t. 29 yrs., g.r. 21*l.*, w.r. 234*l.*	1,360
17 and 18, Martin-st., u.t. 35 yrs., g.r. 5*l.* 10s., w.r. 65*l.*	425

By G. GOULDSMITH, SON, & CO.

Belgravia.—15, Wilton-st., u.t. 17 yrs., g.r. 15*l.*, y.r. 130*l.*	1,360

By SELFE & CO.

Camberwell.—23, Benhill-rd., u.t. 68 yrs., g.r. 6*l.* 6s., y.r. 33*l.*	870
Old Kent-road.—28 to 40 (even), Smyrks-rd., u.t. 15½ yrs., g.r. 21*l.*, w.r. 223*l.* 12s.	815

By A. J. SHEFFIELD.

Poplar.—19 and 20, Grove-villas, f., w.r. 65*l.*	700
Bromley-by-Bow.—284, Devon's-rd. (s.), f., w.r. 31*l.* 4s.	265

By EDWIN EVANS (at Battersea).

Wandsworth.—24, Bellingham-rd., u.t. 87 yrs., g.r. 6*l.* 10s., y.r. 36*l.*	580
Streatham.—32, Pretoria-rd., u.t. 97½ yrs., g.r. 6*l.* 10s., y.r. 32*l.*	275
247, 249, and 251, Mitcham-la., u.t. 97 yrs., g.r. 19*l.* 10s., y.r. 90*l.*	885

April 22.—By WOODS & SNELLING (at Chislehurst).

Chislehurst, Kent.—Red Hill, "Southville" and "Berisal," f., y.r. 82*l.*	950
Orpington, Kent.—Lower-rd., two freehold cottages, w.r. 23*l.* 8s.	185

April 25.—By ELLIOTT, SON, & BOYTON.

Hampstead-rd.—23, Harrington-sq., u.t. 38 yrs., g.r. 11*l.*, p.	625
St. John's wood.—93, Belsize-rd., u.t. 50½ yrs., g.r. 8*l.*, y.r. 38*l.*	325
133, Abbey-rd., u.t. 50½ yrs., g.r. 8*l.* 10s., y.r. 45*l.*	375

By HIBBARD & SONS.

Wood Green.—104 to 110 (even), Winkfield-rd., f., y.r. 115*l.* 16s.	1,210

By WM. HOUGHTON.

Walthamstow.—65 to 71 (odd), Milton-rd., f., w.r. 98*l.* 16s.	875
48, 54 and 56, Milton-rd.; also a plot of land, f., w.r. 72*l.* 3s.	700
2, 4 and 6, Byron-rd., f., w.r. 70*l.* 4s.	630
33 and 35, Byron-rd., f., w.r. 33*l.* 16s.	260
Hoe-st., two freehold building sites	185
7, 8 and 9, Exeter-villas, u.t. 72 yrs., g.r. 9*l.* 10s., w.r. 93*l.* 12s.	600
Leyton.—Sidmouth-rd., f.g. rents 16*l.*, reversion in 83½ yrs.	350
Walthamstow.—97, 99, 101 and 103, Somers-rd., f., w.r. 102*l.* 14s.	1,055
54, Barclay-rd., u.t. 69 yrs., g.r. 2*l.* 10s., w.r. 23*l.* 8s.	140

By MAY & PHILPOT.

Brixton.—55, Acre-la., u.t. 18½ yrs., g.r. 16*l.*, y.r. 75*l.*	575
50, Brailsford-rd., u.t. 70 yrs., g.r. 8*l.* 10s., e.r. 46*l.*	460

By F. VARLEY & SON.

Stoke Newington.—103, Lordship-rd., u.t. 70 yrs., g.r. 12*l.*, e.r 80*l.*	770
Bowes Park.—160 and 162, Whittington-road, u.t. 76 yrs., g.r. 13*l.*, y.r. 56*l.*	460
Hackney.—183, Graham-rd., u.t. 51 yrs., g.r. 8*l.*, y.r. 40*l.*	450

By WRIFORD, DIXON, & WINDER.

Paddington.—96, Chippenham-rd., u.t. 59 yrs., g.r. 8*l.* 10s., w.r. 81*l.* 18s.	510
Southwark.—69, Borough High-st. (s.), y.r. 135*l.*	2,950
Tooting.—Stella-rd., etc., f.g.r. 96*l.*, reversion in 98 yrs.	2,300

By O. E. GRIFFITHS (at Newmarket).

Newmarket, Suffolk.—Bury-rd., "Red Lodge," (Racing Residence), f., p.	1,500

By COCKETT & HENDERSON (at Broadstairs).

Broadstairs, Kent.—Victoria-parade, "Dickens House," f., y.r., 63*l.*	1,350
Charlotte-st., "St. George's-pl." and "Mulberry Tree Cottages," (two), area, 4,655 ft., f., p.	1,650
St. Peter's, Isle of Thanet.—24, High-st., (S), f., y.r. 30*l.*	450

By BALCH & BALCH (at Camden Town).

Hampstead-rd.—48, Werrington-st., u.t. 40½ yrs., g.r. 6*l.* w.r. 94*l.* 18s. (including Mortgage)	610
Holloway.—11, Tavistock-ter., u.t. 34 yrs., g.r. 6*l.* 6s., y.r. 36*l.*	290
50, Benwell-rd., u.t. 59½ yrs., g.r. 7*l.*, w.r. 66*l.* 6s.	400

April 26.—BROAD, WILTSHIRE and PENNY.

Addiscombe. — Havelock-rd. "The Manse," f., p.	1,200
Kilburn.—7, 8, and 9, Cambridge Mews, u.t. 58 yrs., g.r. 12*l.*, w.r. 80*l.* 12s.	400

By DAVID BURNETT & CO.

Kentish Town.—27, Herbert-st., u.t. 63 yrs., g.r. 2*l.*, y.r. 38*l.*	450
Ilford.—7 and 8, Grove Cottages, f., w.r. 31*l.* 4s.	200
Romford, Essex.—249 to 257 (odd), Marks-rd., f., y.r. 91*l.*	540

By T. H. CURRIE & CO.

Highgate.—2 to 18 (even), Winscombe-st., w.r. 332*l.* 16s.; also l.g.r. 4*l.* 10s., u.t. 60 yrs., g.r. 45*l.*	1,820

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By BROWETT & TAYLOR.

Wandsworth.—54, 56, 58, 62, 64, and 66, Westhill (s.), u.t. 79½ yrs., g.r. 18*l.*, y.r. 460*l.* .. £5,475
Deptford.—Hales-st., f.g.r. 17*l.* 11s., reversion in 15½ yrs. 760
Notting Hill.—Queen's-rd., f.g.r. 8*l.*, reversion in 36½ yrs. 295
Queen's-pl., f.g.r. 5*l.*, reversion in 38½ yrs. .. 190
Canning Town.—Clever-rd., f.g.r. 7*l.* 19s., reversion in 77 yrs. 174
Islington.—Barford-st., f.g.r. 5*l.*, reversion in 45 yrs. 220
Clapham.—Milford-st., f.g.r. 6*l.* 6s., reversion in 26 yrs. 270
Leytonstone. — Harrow - rd., etc., f.g.r. 35*l.* 2s. 6d., reversion in 90 yrs. 865
Peckham.—High-st., The Peckham Timber Yard, area 14,000 ft., u.t. 34 yrs., g.r. 1*l.*, y.r. 120*l.* 1,550

By "HARRODS'."

South Kensington.—7, Egerton-gdns., u.t. 72 yrs., g.r., etc., 48*l.*, y.r. 300*l.* 3,700
Lingfield, Surrey.—Dorman's Pk., "Esperanza," f., p. 460

By HOBSON, RICHARDS, & Co.

Brixton.—28, Josephine-av., u.t. 61½ yrs., g.r. 10*l.*, y.r. 48*l.* 390
Twickenham.—The Cres., f.g. rents 55*l.*, reversion in 77 yrs. 1,380
Leytonstone.—Leytonstone-rd., f.g.r. 30*l.* 10s., reversion in 78½ yrs. 770
Upton Park.—Plashet-la., f.g.r. 27*l.*, reversion in 79 yrs. 680

By KNIGHT & Co.

South Kensington.—97 and 97a, Drayton-gdns., area 5,565 ft., f., e.r. 200*l.* 2,990

By PYKE, PYKE & HOWLAND.

Camden Town.—148 and 150, High-st. (S), u.t. 64 yrs., g.r. 88*l.*, y.r. 400*l.* 4,300

By REYNOLDS & EASON.

Norwood.—2, The Parade (S), u.t. 87 yrs., g.r. 21*l.*, y.r. 120*l.* 1,590
Regent's Park. — Albany-st., an improved rental of 25*l.* 4s. for 20 yrs. (with reversion) 475

By A. H. TURNER & Co.

Notting Hill.—South-row and Great Western-ter., f.g. rents 144*l.*, reversions in 26, 27, 28 and 78 yrs. 4,625

By FREDERICK WARMAN.

Highbury.—123, Highbury New-pk., u.t. 45 yrs., g.r. 10*l.* 10s., p. 760
165, Highbury New-pk., u.t. 45½ yrs., g.r. 15*l.*, p. 790
37, Highbury New-pk., u.t. 46 yrs., g.r. 15*l.*, p. 850
Leyton.—75, Lyttleton-rd., u.t. 92½ yrs., g.r. 3*l.* 13s., w.r. 35*l.* 2s. 220

By DEBENHAM, TEWSON, & Co.

Limehouse.—132, Narrow-st. (wharf), area 5,840 ft., u.t. 48 yrs., y.r. 115*l.* 500
Kilburn.—High-rd., f.g.r. 130*l.* 1s. 10d., reversion in 71 yrs. 4,000
Iverson-rd., f.g.r. 24*l.* 10s., reversion in 71 yrs. 680
10 to 20 (even), Iverson-rd., f., y.r. 240*l.* .. 4,100
Hackney.—159 to 171, 175 to 179 (odd), Amhurst-rd., f., y.r. 491*l.* 6,680
Kennington.—38, Kennington Park-rd. (s.), area 1,090 ft., c., y.r. 42*l.* 520
27, 29, 31, 33, and 40, Opal-st., c., y.r. 146*l.*, 12s. 1,000
Clerkenwell. — Myddleton - sq., i.g. rents 93*l.* 3s. 8d., u.t. 8 yrs., g.r. 64*l.* 11s. 4d.. 165
Acton.—14 and 16, Churchfield-rd. East, u.t. 63 yrs., g.r. 16*l.*, y.r. 90*l.* 1,100
South Kensington.—4 and 6, Drayton-gdns., u.t. 39½ yrs., g.r. 4*l.*, y.r. 153*l.* 1,210
14, 16, 20, and 22, Drayton-gdns., u.t. 39½ yrs., g.r. 8*l.*, y.r. 265*l.* 2,590
3, 5, and 9, Drayton-gdns., u.t. 39½ yrs., g.r. 6*l.*, y.r. 225*l.* 1,990
Drayton-gdns., i.g.rents 10*l.*, u.t. 39½ yrs., g.r. 2*l.* 140
Drayton-gdns., a plot of land, area 3,700 ft., u.t. 39 yrs., g.r. nil, y.r. 12*l.* 190

By E. FERGUSSON TAYLOR (at New Barnet).

New Barnet, Herts.—Leicester-rd., four freehold residences, y.r. 170*l.* 2,255
Leicester-rd.—A freehold cottage, w.r. 9*l.* 2s. 600
1 and 2, Victoria-villas, f., w.r. 40*l.* 6s. 350

April 27.—By DYER, SON, & HILTON.

Lee.—52, Burnt Ash-rd., u.t. 53½ yrs., g.r. 10*l.*, p. 750

By FLOOD & SON.

Hyde Park.—Porchester-ter., i.g.r. 20*l.*, u.t. 17½ yrs., g.r. nil 250

By HAROLD GRIFFFIN.

Battersea.—11, Somerset-st., u.t. 47 yrs., g.r. 2*l.* 10s., w.r. 28*l.* 12s. 160
13, 15, 17, and 19, Somerset-st., w.r. 67*l.* 12s.; also i.g.r. 2*l.* 10s., u.t. 47 yrs., g.r. 1*l.* 16s. 440
5 and 6, Hart-st., u.t. 46 yrs., g.r. 3*l.* 12s., w.r. 35*l.* 2s. 235
48 to 53, Frances-st., u.t. 47 yrs., g.r. 15*l.* 5s., w.r. 124*l.* 16s. 805

By HERRING, SON, & DAW.

Brixton.—79, Effra-rd., u.t. 75½ yrs., g.r. 10*l.* 10s., p. 400

By NOKES & NOKES.

Caledonian-road.—8 to 15, Caledonian-cres., f., y.r. 274*l.* 16s. 4,280

By C. SPARROW & SON.

King's Cross.—42 to 52 (even), York-rd (including the "Lincoln Arms" p.h.), 9 to 16, Railway-st., 1 to 11, Buckingham Mews, area 15,000 ft., f., y.r. 1,027*l.* 19s. (in one lot) 11,900
Finchley.—8, Granville-rd., f., y.r. 55*l.* 850

By DOUGLAS YOUNG & Co.

Aldersgate.—5, Fann-st. (Club Premises), a profit rental of 70*l.* for 63½ yrs. 700
Canning Town.—Tucker-st., f.g.r. 30*l.*, reversion in 64 yrs. 600
Wandsworth.—13, Lemuel-st., u.t. 58 yrs., g.r. 5*l.*, y.r. 3*l.* 230

By WYATT & SON (at Chichester).

Boxgrove, Sussex.—Six freehold cottages, w.r. 34*l.* 1s. £425
Old Fishbourne, Sussex.—Three copyhold cottages, y.r. 25*l.* 14s. 265

By DEBENHAM, TEWSON, & Co. (at Heathfield).

Heathfield, Sussex.—"Bonishersh," and 15, Church Gates, f., y.r. 47*l.* 900
1 to 8, Church Gates, f., y.r. 52*l.* 430
9, 10, and 11, Church Gates, long leasehold, y.r. 21*l.* 14s. 280
16 and 17, Church Gates, also "Wallview Cottage," f., y.r. 27*l.* 400
"Kitwish," f., y.r. 12*l.* 200
"Schoolhill Villa," f., y.r. 15*l.* 310
19, 20, and 21, Spicer's Cottages, f., y.r. 39*l.* 9s. 6d. 560

By MADDISON, MILES, & MADDISON (at Yarmouth).

Yarmouth, Norfolk.—Regent-passage, freehold builder's yard, timber stores, etc., area 4,015 ft., y.r. 26*l.* 400
Gorleston, Suffolk.—20, England's-la., f., y.r. 13*l.* 140

April 28.—By COOPER & GOULDING.

Wandsworth.—250 and 252, Earlsfield-rd., u.t. 83 yrs., g.r. 12*l.*, w.r. 70*l.* 4s. 395
Finsbury Park.—113 and 115, Gillespie-rd., u.t. 73 yrs., g.r. 10*l.*, y.r. 61*l.* 490

By CURTIS & HENSON.

Aldingbourne, Sussex.—"Westergate House Estate," 112a. 2r. 17p., f. 10,000
"Mount Pleasant" (residence) and 14a. 2r. 5p., f. 1,350

By JENKINS & SONS.

Homerton.—286 and 288, Glyn-rd., f., w.r. 54*l.* 12s. 550

By C. C. & T. MOORE.

Enfield.—Manor-rd., "The Manor House," f., p. 800
Caledonian-road.—7, 8, and 9, Balmoral-gr. u.t. 58 yrs., g.r. 18*l.*, y.r. 81*l.* 650
Dalston.—145, Sandringham-rd., u.t. 56½ yrs., g.r. 6*l.* 10s., w.r. 66*l.* 6s. 400
Poplar.—1, 3, and 5, Willis-st., u.t. 41 yrs., g.r. 3*l.* 10s., w.r. 84*l.* 10s. 535
159 and 161, Brunswick-rd., u.t. 35 yrs., g.r. 7*l.*, w.r. 70*l.* 4s. 415
193, Grundy-st., u.t. 38½ yrs., g.r. 3*l.*, w.r. 28*l.* 12s. 180

By J. C. PLATT.

Holborn.—13, Red Lion-passage (s.), f., y.r. 46*l.* 845
Shepherd's Bush.—19, Coverdale-rd., f., y.r. 50*l.* 770
Chiswick.—42 and 44, Strand-on-the-Green, c., y.r., 50*l.* 1,010

By WM. STEVENS.

Dalston.—108 to 114 (even), Brougham-rd., u.t. 40½ yrs., g.r. 40*l.*, y.r. 154*l.* 16s. 630

By STIMSON & SONS.

Peckham.—Trafalgar-sq., f.g. rents 48*l.*, reversion in 71 yrs. 1,190
Dulwich.—Heber-rd., f.g. rents 31*l.* 10s., reversion in 74 yrs. 770
Forest Hill.—Perry Vale, f.g.r. 8*l.* 15s., reversion in 72 yrs. 200
Siddons-rd., f.g. rents 25*l.* 5s., reversion in 72 and 80 yrs. 625
Plumstead, Kent.—Marmadon-rd., f.g.r. 20*l.*, reversion in 93 yrs. 440
Putney.—Fawe Park-rd., f.g.r. 21*l.*, reversion in 89 yrs. 475
Hammersmith.—St. Dunstan's-rd., f.g. rents 52*l.*, reversion in 84 yrs. 1,205
Chiswick.—Wolseley-gdns., f.g. rents 50*l.*, reversion in 80 yrs. 1,210
Kilburn.—Tennyson-rd., f.g.r. 16*l.* 10s., reversion in 83 yrs. 420
Highgate.—Bismarck-rd., f.g.r. 6*l.* 10s., reversion in 72 yrs. 165
Harringay.—Beresford-rd., f.g. rents 10*l.* 10s., reversion in 90 yrs. 260
Southwark.—7 to 13 (odd), King James-st., and 35 to 40, Little Surrey-st., f., y.r. 327*l.* 12s. 3,070
Battersea.—31, 33, 35, and 37, Cabul-rd., w.r. 98*l.* 16s.; also i.g.r. 7*l.* 10s., u.t. 93 yrs., g.r. 24*l.* 650
West Ham.—161, Ham Park-rd., u.t. 75 yrs., g.r. 6*l.* 10s., y.r. 34*l.* 300

April 29.—By ARTHUR BARTON.

Lee.—2, Newstead-rd., u.t. 66 yrs., g.r. 15*l.*, y.r. 75*l.* 800

By C. W. DAVIES & SON.

Clerkenwell.—47, Exmouth-st. (s.), u.t. 12 yrs., g.r. 8*l.*, e.r. 90*l.* 310
Stoke Newington.—9, Stoke Newington-common. u.t. 69½ yrs., g.r. 7*l.*, e.r. 48*l.* 435
28 and 30, Spenser-rd., u.t. 50 yrs., g.r. 8*l.* w.r. 78*l.* 530

By JONES, LANG, & Co.

Tottenham Court-road.—19 to 21a, Store-st., and 33 to 38, Alfred-pl., area 13,400 ft., building lease for 80 yrs., let at per annum 850

By WM. HOLLIS.

Finchley.—Hendon-la., "Suva," u.t. 95 yrs., g.r. 10*l.* 10s., y.r. 55*l.* 550
Hendon.—Sunny-gdns., eleven freehold building plots 1,037

By WOOTTON & GREEN.

Camberwell.—42 and 46, Wyndham-rd., f., w.r. 67*l.* 12s. 750

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, MAY 6.

Architectural Association.—Mr. A. E. Munby, M.A., F.C.S., on "The Value of Science in an Architectural Curriculum." 7.30 p.m.

Junior Institution of Engineers (Westminster Palace Hotel).—Mr. A. W. Young on "The Design of a Dry Dock." 8 p.m.

Incorporated Association of Municipal and County Engineers.—Visit to Catcleugh Reservoir (Newcastle and Gateshead Waterworks).

SATURDAY, MAY 7.

Sanitary Inspectors' Association.—An Extraordinary General Meeting, Carpenters' Hall, London Wall, E.C. The President will deliver his Annual Address, 6 p.m.

British Institute of Certified Carpenters.—Carpenters, Hall. 6 p.m.

South Western Polytechnic.—Conversazione. 7 to 10 p.m.

Edinburgh Architectural Association.—Visit to Dunfermline—the Carnegie Baths and Gymnasium and the Abbey.

Northern Architectural Association.—Visit to New Buildings in Dean-street, Newcastle, and the Laing Gallery.

Incorporated Association of Municipal and County Engineers.—Northern District Meeting; Newcastle-on-Tyne.

MONDAY, MAY 9.

Society of Arts (Cantor Lecture).—Professor R. Langton Douglas, M.A., on "The Majolica and Glazed Earthenware of Tuscany," I. 4.30 p.m.

Institute of Sanitary Engineers, Ltd.—Organising Committee, 3 p.m. Examination and Literary Committee, 5 p.m. By-Laws Committee, 6 p.m.

Bristol Society of Architects.—Mr. P. Fitzgerald, M.A., on "Robert Adam, Artist and Architect," with Limelight Illustrations. 8 p.m.

TUESDAY, MAY 10.

Royal Institution.—Mr. L. Fletcher, M.A., F.R.S., on "Meteorites," II. 3 p.m.

Society of Arts (Applied Art Section).—Mr. W. Burton, F.C.S., on "Crystalline Glazes and their Application to the Decoration of Pottery." 8 p.m.

WEDNESDAY, MAY 11.

Society of Arts.—Mr. Richard R. Holmes, on "Early Painting in Miniature." 8 p.m.

THURSDAY, MAY 12.

Auctioneers' Institute.—Annual General Meeting, 2.30 p.m.

Institution of Electrical Engineers.—8 p.m.

Society for the Encouragement of the Fine Arts.—Second Conversazione, at the Galleries of the Royal Society of British Artists, Suffolk-street, Pall Mall.

FRIDAY, MAY 13.

Architectural Association.—Members' Dinner, Criterion Restaurant, Piccadilly Circus. 7 p.m.

Royal Institution.—Mr. M. H. Spielmann, F.S.A., on "The Queen Victoria Memorial." 9 p.m.

SATURDAY, MAY 14.

Architectural Association.—First Summer Visit—to Moor Park, Rickmansworth.

Incorporated Association of Municipal and County Engineers.—Yorkshire District Meeting, York.

Institute of Sanitary Engineers, Ltd.—Visit to Power Station, London Tramways Co.; and Messrs. Thorneycroft's Works, Chiswick.

British Institute of Certified Carpenters.—Visit to St. Paul's. 2.45 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks	1	16	0	per 1000	alongside, in river.	
Rough Stocks and Grizzles	1	13	0	,,	,,	,,
Facing Stocks ...	2	12	0	,,	,,	,,
Shippers	2	10	0	,,	,,	,,
Flettons	1	10	0	,,	at railway depôt.	
Red Wire Cuts ...	1	13	0	,,	,,	,,
Best Fareham Red	3	12	0	,,	,,	,,
Best Red Pressed Runbon Facing	5	0	0	,,	,,	,,
Best Blue Pressed Staffordshire ...	4	4	0	,,	,,	,,
Do. Bullnose	4	10	0	,,	,,	,,
Best Stourbridge Fire Bricks.....	4	8	0	,,	,,	,,
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	13	0	0	,,	,,	,,
Headers	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	17	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers...	16	0	0	,,	,,	,,
One Side and two Ends	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamferred, Squints.	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers...	14	0	0	,,	,,	,,
One Side and two Ends	15	0	0	,,	,,	,,
Two Sides and one End	15	0	0	,,	,,	,,
Splays, Chamferred, Squints	14	0	0	,,	,,	
Second Quality, White and Dipped Salt Glazed	2	0	0	,,	less than best.	

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BRICKS, &c.—(*Continued*).

	s.	d.	
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	,, ,,
Best Portland Cement	30	0	per ton, ,,
Best Ground Blue Lias Lime	21	0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s.	d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½	,, ,,
PORTLAND STONE (20 ft. average)—			
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	1	,, ,,
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2	2½	,, ,,

	s.	d.	
Ancaster in blocks	1	11	per ft. cube, deld. rly. depôt.
Beer ,,	1	6	,, ,,
Greenshill ,,	1	10	,, ,,
Darley Dale in blocks	2	4	,, ,,
Red Corsehill ,,	2	5	,, ,,
Closeburn Red Freestone	2	0	,, ,,
Red Mansfield ,,	2	4	,, ,,

YORK STONE—*Robin Hood Quality*

	s.	d.	
Scappled random blocks	2	10	per ft. cube. ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per foot super. ,,
6 in. rubbed two sides ditto, ditto	2	6	,, ,,
3 in. sawn two sides slabs (random sizes)	0	11½	,, ,,
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	,, ,,
1½ in. to 2 in. ditto, ditto	0	6	,, ,,
HARD YORK—			
Scappled random blocks	3	0	per ft. cube, ,,
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super. ,,
6 in. rubbed two sides Ditto	3	0	,, ,,
3 in. sawn two sides (slabs random sizes)	1	2	,, ,,
2 in. self-faced random flags	0	5	,, ,,

Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube.
,, ,, ,, 6 in. sawn both sides landings	2	7	deld. rly. depôt per ft. super. deld. rly. depôt
,, ,, ,, 3 in. do.	1	2½	,, ,,

SLATES.

in.	in.	£	s.	d.	
20 × 10	best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
20 × 12	,, ,,	13	17	6	,, ,,
20 × 10	first quality ,,	13	0	0	,, ,,
20 × 12	,, ,, ,,	13	15	0	,, ,,
16 × 8	,, ,, ,,	7	5	0	,, ,,
20 × 10	best blue Portmadoc	12	12	6	,, ,,
16 × 8	best blue Portmadoc	6	12	6	,, ,,
20 × 10	best Eureka unfading green	15	17	6	,, ,,
20 × 12	,, ,,	18	7	6	,, ,,
18 × 10	,, ,,	13	5	0	,, ,,
16 × 8	,, ,,	10	5	0	,, ,,
20 × 10	permanent green	11	12	6	,, ,,
18 × 10	,, ,,	9	12	6	,, ,,
16 × 8	,, ,,	6	12	6	,, ,,

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depôt.
Hip and Valley tiles	3	7	per doz. ,, ,,
Best Brosely tiles	50	0	per 1000 ,, ,,
Do. Ornamental tiles	52	6	,, ,, ,,
Hip and Valley tiles	4	0	per doz. ,, ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000 ,, ,,
Do. Ornamental do	60	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	0	,, ,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 ,, ,,
Do. Ornamental do	54	6	,, ,, ,,
Hip tiles	4	1	per doz. ,, ,,
Valley tiles	3	8	,, ,, ,,
Best "Rosemary" brand plain tiles	48	0	per 1000 ,, ,,
Best Ornamental tiles	50	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	8	,, ,, ,,
Best "Hartshill" brand plain tiles, sand faced.	50	0	per 1000 ,, ,,
Do. pressed	47	6	,, ,, ,,
Do. Ornamental do	50	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	6	,, ,, ,,

WOOD.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15	10	0	16	10	0
Deals: best 3 by 4	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0	12	10	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	,, ,,		
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	9	10	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0
Foreign Sawn Boards—						
1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	,,		

WOOD.—(*continued*).

	At per load of 50 ft. £	s.	d.	£	s.	d.
Fir timber: best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft. average)	3	5	0	3	15	0

JOINERS' WOOD.

	At per standard. £	s.	d.	£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in	23	0	0	24	0	0
3 in. by 9 in.	21	0	0	22	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	18	10	0
Second yellow deals, 3 in. by 11 in	18	10	0	20	0	0
,, ,, 3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	15	10	0	16	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Petersburg: second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	10	0	14	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg:—						
First white deals, 3 in. by 11 in.	14	10	0	15	10	0
,, ,, 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
,, ,, 3 in. by 9 in.	12	10	0	13	10	0
,, ,, battens	9	10	0	10	10	0
Pitch-pine: deals	16	10	0	20	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	35	0	0	upwards.		
Oddments	24	0	0	26	0	0
Seconds, regular sizes	26	10	0	28	10	0
Yellow Pine oddments	22	0	0	24	0	0
Kauri Pine—Planks, per ft. cube	0	3	6	0	5	0
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	2	6	0	3	6
Small ,, ,,	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube.	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	7	0	0	8
¾ in. do. do.	0	0	6½		—	
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	21	0	0
American Whitewood Planks—per ft. cube	0	4	0		—	

Prepared Flooring—	Per square. £	s.	d.	£	s.	d.
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
¾ in. by 7 in. do. do. do.	0	14	0	0	18	0
1 in. by 7 in. white do. do.	0	10	0	0	11	6
in. by 7 in. do. do. do.	0	11	6	0	13	6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	6	5	0	7	5	0
Compound Girders, ordinary sections	8	2	6	9	5	0
Angles, Tees and Channels, ordinary sections	7	17	6	8	17	6
Flitch Plates	8	5	0	8	15	0
Cast Iron Columns and Stanchions including ordinary patterns	7	2	6	8	5	6

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON—						
Common Bars	7	5	0	7	15	0
Staffordshire Crown Bars, good merchant quality	7	15	0	8	5	0
Staffordshire "Marked Bars"	10	0	0		—	
Mild Steel Bars	8	15	0	9	5	0
Hoop Iron, basis price	9	5	0	9	10	0
,, ,, Galvanized	17	10	0		—	
(*And upwards, according to size and gauge.)						
Sheet Iron (Black)—						
Ordinary sizes to 20 g.	9	15	0		—	
,, ,, 24 g.	10	15	0		—	
,, ,, 26 g.	12	5	0		—	
Sheet Iron, Galvanised, flat, ordinary quality—						
Ordinary sizes to 20 g.	16	0	0		—	
,, ,, 22 g. and 24 g.	16	10	0		—	
,, ,, 26 g.	18	0	0		—	
Galvanised Corrugated Sheets—						
Ordinary sizes 6 ft. to 8 ft. 20 g.	12	10	0		—	
,, ,, 22 g. and 24 g.	13	0	0		—	
,, ,, 26 g.	13	15	0		—	
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11	15	0		—	
Best Soft Steel Sheets, 22 g. & 24 g.	13	15	0		—	
,, ,, ,, 26 g.	14	0	0		—	
Cut nails, 3 in. to 6 in.	9	0	0	9	10	0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3lb. and up	14	17	6	...	—	
Pipe in coils	15	7	6	...	—	
Soil pipe	17	17	6	...	—	
Compo pipe	17	17	6	...	—	
ZINC—Sheet—						
Vieille Montagne ....ton	27	5	0	...	—	
Silesian	27	0	0	...	—	
COPPER—						
Strong Sheet....per lb.	0	0	10½	...	—	
Thin ,, ... ,,	0	0	11½	...	—	
Copper nails .... ,,	0	0	11	...	—	
BRASS—						
Strong Sheet .... ,,	0	0	10	...	—	
Thin ,, ... ,,	0	0	11	...	—	
TIN—English Ingots .... ,,	0	1	4	...	—	
SOLDER—Plumbers' .... ,,	0	0	6½	...	—	
Tinmen's .... ,,	0	0	8	...	—	
Blowpipe .... ,,	0	0	9	...	—	

ENGLISH SHEET GLASS IN CRATES.

15 oz.	thirds	2d.	per ft. delivered.
,,	fourths	1½d.	,, ,,
21 oz.	thirds	3d.	,, ,,
,,	fourths	2½d.	,, ,,
26 oz.	thirds	3½d.	,, ,,
,,	fourths	3d.	,, ,,
32 oz.	thirds	4½d.	,, ,,
,,	fourths	4d.	,, ,,
Fluted Sheet, 15 oz.		2½d.	,, ,,
,,	21 oz.	3½d.	,, ,,
¼ Hartley's Rolled Plate		1½d.	,, ,,
⅛ ,, ,, ,,		1¾d.	,, ,,
¼ ,, ,, ,,		2½d.	,, ,,

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes or barrels	per gallon	0	1	5
,, ,, ,, in drums	,,	0	1	8
Boiled ,, ,, in pipes or barrels	,,	0	1	8
,, ,, ,, in drums	,,	0	1	11
Turpentine, in barrels	,,	0	3	7
,, in drums	,,	0	3	9
Genuine Ground English White Lead	per ton	19	0	0
Red Lead, Dry	,,	19	0	0
Best Linseed Oil Putty	per cwt.	0	6	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

TO CORRESPONDENTS.

C. & W.—H. D.—H. E.—C. F. M. & Son (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

AUDLEM.—For erecting a town hall and caretaker's house, for Audlem Public Hall Company. Mr. R. Matthews, architect, Parr's Bank-chambers, Nantwich. Quantities by architect:—

Heywood	£1,890 0 0	Harding	£1,630 0 0
Edge	1,877 0 0	Gresty & Son	1,585 0 0
Kendall	1,811 0 0	Manley & Son	1,545 0 0
Neild & Son	1,730 0 0	Stretton & Gibson, Audlem†	1,523 6
Cox & Vaughan	1,676 0 0		
Healey	1,630 0 0		

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BALLYMONEY.—For erecting three bridges at Stranocum, Crookan, and Ballybradden, for the Rural District Council. Mr. John H. Brett, C.E., County Surveyor, Belfast:—

To cut a hill, fill hollows, and make a new bridge on the road from Clough to Ballycastle	J. McGarry, Tober, Pharis	£264
To build a new bridge over the River Bush at Stranocum	F. Haggarty, Park Mills, Armoy	3,449
To build a bridge across the River Bush at Crookan	F. Haggarty, Park Mills, Armoy	788

BECCLES.—For alterations and additions to premises in Smallgate-street, for the Working Men's Co-operative Association, Ltd. Mr. A. Pells, F.S.I., architect, London-road, Beccles:—

Hindes & Co.	£806	Boddy & Son	£696
F. J. Allen	735	Youngs & Son, Norwich*	675
Hipperson Bros.	734		
J. Gaze	725		

BOLTON-UPON-DEARNE.—For extension of main sewer, Furlong-road, for the Urban District Council. Mr. J. W. Wilson, Surveyor to Urban District Council. Quantities by Surveyor:—

T. Ward	£212 0 0	Wm. Baines, Beevers-street, Goldthorpe*	£174 0 0
S. Hamilton	210 0 0		
J. Searle	194 0 0		

BRADFIELD (Essex).—For erecting a new hotel and stabling, for Messrs. Steward & Patteson, Ltd. Mr. J. W. Start, F.S.I., architect, Colchester. Quantities by the architect:—

	Hotel.	Stables.	Total.
W. C. Theobald	£1,646	£698	£2,344
P. Banyard	1,585	635	2,220
Scales & Robins	1,485	620	2,105
J. McKay	1,498	568	2,066
Cubitt & Gotts	1,460	600	2,060
Saunders & Son	1,570	460	2,030
Wheeler	1,543	465	2,008
E. West	1,467	528	1,995
Gladwell	1,434	547	1,981
A. Plummer	1,425	555	1,980
W. E. Capon	1,464	506	1,970
W. Chambers	1,420	530	1,950
Grimwood & Son	1,370	523	1,893
Smith & Beaumont	1,300	523	1,824
E. Saunders, Dovercourt*	1,348	449	1,797

CARK-IN-CARTMEL.—For the erection of a new church, for the Trustees of Cark Wesleyan Church. Messrs. Sames & Henshaw, architects, Oxford-chambers, Abbey-road, Barrow:—

A. J. Blair, Cark-in-Cartmel* £1,100

CARLISLE.—For erecting Wesleyan Chapel and School, Monkhill, for the Trustees. Mr. H. Higginson, architect, 3, Lonsdale-street, Carlisle. Quantities by the architect:—

Builder: J. Laing & Son, Carlisle*	£435 12 0	Subject to certain Schedule deductions.
Joiner: J. Beaty, Kirkbride*	325 12 6	
Plasterer: P. Gannon, Carlisle*	50 14 9	
Slater: J. T. Kellett, Carlisle*	44 10 0	
Painter: R. S. Kirk, Carlisle*	31 10 0	
Plumber: W. J. Wilson, Carlisle	29 7 0	

CARSHALTON.—For making up Stanley-road, for the Urban District Council. Mr. W. W. Gale, Surveyor. Quantities by Surveyor:—

R. W. Swaker	£2,964 7 4	London & County Blds., Ltd.	£2,526 16 2
Harvey Bros.	2,692 10 5	Edmund Iles	2,217 18 3
Lawrence & Thacker	2,658 10 8	J. B. Patter, Sutton (Surrey)*	2,130 3 2
W. Hall	2,638 19 5		
W. Martin	2,609 0 0		
Free & Sons	2,582 7 8		
T. Adams	2,559 16 0		

CHELMSFORD.—For the construction of a covered service reservoir for the Town Council. Cuthbert Brown, A.M.I.C.E., Borough Engineer:—

J. H. MacDonald	£7,000 0 11
T. W. Pedrette	6,754 13 2
G. G. Rayner	6,353 10 6
H. Ashley	6,274 12 8
A. Fasey & Son	6,103 4 9
J. & T. Binns	6,017 3 5
G. Wimpey & Co.	5,665 17 7
E. West	5,650 0 0
G. Bell	5,590 17 10
J. H. Vickers, Ltd.	5,544 1 11
J. Jackson	5,479 1 5
Jenkins & Son	5,447 18 3
F. Johnson	5,436 6 0
Greig & Mathew	5,375 7 5
Callender & Co.	5,346 5 0
Smith Bros.	5,260 0 0
Moran & Son	5,229 0 0
J. Double	5,046 0 0
H. Potter & Son, Chelmsford*	4,777 0 0
W. E. Westgate	4,753 0 0

[Borough Engineer's estimate, £4,800.]

CHELMSFORD.—For the supply and delivery of 225 tons of 10-in. cast-iron pipes and other castings, for the Town Council. Cuthbert Brown, A.M.I.C.E., Borough Engineer:—

J. & T. Binns	£1,547 17 6	G. Double	£1,256 11 3
J. Jackson	1,494 0 0	H. Potter & Son	1,256 1 3
Greig & Mathews	1,437 16 5	Cochrane & Co.	1,249 17 3
J. Robson	1,424 1 5	H. Ashley	1,232 1 3
G. Bell	1,371 10 0	Staveley Coal & Iron Co.	1,225 11 3
Callender & Co.	1,369 11 5	Moran & Son	1,221 5 0
W. E. Westgate	1,363 19 0	Cochrane & Co., Ltd.	1,207 10 9
J. Oakes	1,317 6 4	A. G. Clark	1,196 15 0
Abbott & Co., Ltd.	1,309 7 7	T. H. P. Denniss & Son	1,191 0 2
Roberts & Co.	1,286 3 9	Clay Cross Co.	1,169 13 8
Wimpey & Co.	1,285 2 6	Holwell Iron Co., Melton Mowbray*	1,131 18 7
Reid Bros.	1,277 8 6		
Sheepbridge Coal & Iron Co.	1,260 1 3		

[Borough Engineer's estimate, £1,177.]

COLWYN BAY.—For erecting a house and stables at Groes Field, for Mr. Richard Wood. Messrs. J. M. Porter & Hunter, architects and surveyors, The Estate Office, Colwyn Bay:—

Lloyd Jones	£1,150 0 0	Roberts Bros.	£1,060 0 0
Wood & Co.	1,147 8 0	Evan Owen*	959 12 6
S. Bond	1,106 0 0		

DARTMOUTH.—For additions to the Trafalgar Inn, for Mrs. Maria Walls. Mr. E. H. Back, architect and surveyor, Dartmouth. Quantities by architect:—

R. T. Pillar	£275 0 0
Bach & Watts	259 0 0
Wills & Anderson, Strete, nr. Dartmouth*	237 11 0

HALIFAX.—For the conversion of premises in Wade-street to a public-house. Messrs. Jackson & Fox, architects, 7, Rawson-street, Halifax:—

Mason: T. Bentley & Sons, Parkinson-lane, Halifax	£290 0
Joiner: S. Greenwood, Boothtoun, Halifax	151 10
Plumber: R. P. Stafford, King Cross-street, Halifax	91 15
Plasterers: Rushworth & Firth, New Bank, Halifax	40 10
Painter: W. Taylor, Parkinson-lane, Halifax	9 10

LEICESTER.—For Belgrave sewerage works (Contract No. 1), for the Corporation. Mr. E. Geo. Mawbey, M.Inst.C.E., Borough Engineer, Town Hall, Leicester:—

J. S. Dawson	£5,184 18 0	Langley & Co., 111, Moira-st., Leicester*	£3,403 14 8
T. Philbrick	3,937 19 0		
J. H. Smedley	3,886 10 6		
J. Holme	3,862 6 0		
Johnson & Langley	3,675 17 8		

LEIGH.—For building basement of proposed municipal buildings, Market-street, for the Leigh Corporation. Mr. J. C. Prestwich, architect, Bradshawgate-chambers, Leigh. Quantities by architect:—

J. W. Cowhurn, Leigh* £1,770

LEIGH (Lancashire).—For erecting an infirmary. Mr. J. C. Prestwich, architect, Bradshawgate-buildings, Leigh:—

Bywater & Sons	£21,500	Atherton & Co., Ltd.	£18,468
White & Sons	20,547	W. Townson & Sons, Ltd.	18,420
Hatch & Sons	19,985	J. H. Wilson	18,263
T. & W. Meadows	19,545	R. Neill & Sons, Ltd.	18,250
H. Fairclough	19,500	J. Tinline	18,000
H. & F. Lomax	19,500	W. Cunliffe	17,918
S. & J. Hodgkiss	19,441	J. C. & F. Woods	17,891
E. & D. Maginnis	19,231	J. Cocker, Walkden*	17,649
S. Warburton	19,169		
Gerrard & Sons, Ltd.	18,792		
J. W. Cowburn	18,780		
C. W. Davenport	18,774		

LEYTON.—For situ-concrete paving and terrazzo paving at Norlington-road school, for the Education Committee. Mr. W. Jacques, architect, 2, Fen-court, Fenchurch-street, E.C.:—

	Situ-Concrete.	Terrazzo.
Art Pavements & Decorations, London	£148 14 1	£260 2 2
Atlas Stone Co., Cambridge	96 0 5	264 17 6
Bradford & Co., Homerton	111 18 6	—
Engratic Stone Co., Fulham	101 11 6	303 9 3
Geary, Walker, & Co. Ltd., London	—	253 14 0
Hobman & Co., Bermondsey	117 18 6	334 17 9
Hodkin & Jones, Ltd., City	113 4 6	—
Malcolm, Macleod, & Co., City	96 18 5	—
Mosaic Manufacturing Co., St. Pancras	—	244 17 6
Mosaic Workers Co-operative, Islington	—	262 10 6
Patent Impervious Stone Co., Hammersmith	98 4 2	—
Patent Victoria Stone Co., Stratford	118 12 6	—
Turpins Flooring Co., Bayswater	128 1 2	268 12 6
Westminster Flooring Co., Chelsea	98 12 1	264 5 6

LICHFIELD.—For enlargement of the Post Office at Lichfield, for the Commissioners of H.M. Works and Public Buildings:—

		Credit old materials.
D. Roberts	£3,670	£10
G. H. Marshall	3,696	17
G. Webb	3,871	36
T. Walmesley	4,236	28
T. Mason	4,500	30

LLANDAFF.—For erecting a chemical and physical laboratory, studio, etc., to school buildings, for the Governors of Howell's Glamorgan County School for Girls. Mr. G. E. Halliday, architect, 14, High-street, Cardiff. Quantities by Mr. J. W. Rodger, Cardiff:—

Beams & Nephew	£3,250 0 0	G. Hallett	£2,910 0 0
Lathy & Co.	3,227 0 0	W. Cox	2,788 6 6
Knox & Wells	3,177 0 0	F. C. Williams	2,670 0 0
David Davies	3,140 0 0	Blache Bros.	2,525 0 0
C. W. Cadwallader	3,100 0 0	C. C. Dunn, Cardiff*	2,500 0 0
F. Bond	2,992 0 0		

LONDON.—For the supply of a new crane at Barking outfall, for the London County Council:—

J. Booth & Bros., Ltd., Rodley, (according to material used and height of backstays)	£421 to £461 0 0
T. Smith & Sons (heavy crane)	445 10 0
H. J. Coles, Derby (heavy crane)	438 0 0
T. Smith & Sons (light crane)	429 10 0
J. H. Wilson & Co., Ltd.	393 10 0
H. J. Coles, Derby (light crane)*	346 0 0
Grafton & Co.	342 0 0
Isles, Ltd.	340 0 0

LONDON.—For building new stabling at Scavenging Depot, Reliance Wharf, Hertford-road, for the Shoreditch Borough Council. Mr. J. Rush Dixon, Borough Surveyor, Town Hall, Old-street, E.C.:—

F. Willmott, Ilford* £1,294

LONDON.—For the erection of superstructure, Greenwich electricity generating station, for the L.C.C.:—

F. J. Gorham	£71,355 7 3
J. Dickson	69,944 16 0
Martin, Wells, & Co., Ltd.	66,447 0 0
Foster Brothers	61,975 0 0
J. Mowlem & Co., Ltd.	59,402 0 0
F. G. Minter	59,159 0 0
Mayoh & Haley	58,810 6 10
F. Miskin, Ltd.	58,795 15 8
F. and H. F. Higgs	58,608 0 0
R. Wilkins & Sons	58,465 0 0
A. Faulks	56,472 0 0
J. E. Johnson & Son	55,968 0 0
Holloway Brothers	55,900 0 0
B. E. Nightingale	54,972 0 0
H. L. Holloway	54,330 0 0
F. & T. Thorne	54,273 0 0
Kirk & Randall	54,263 0 0
H. Lovatt, Ltd., London and Wolverhampton*	52,970 0 0

LONDON SCHOOL BOARD TENDERS.

The exteriors of the following schools will be painted between 14th May and 11th June, 1904:—

Hal'ord-road.

E. Flood	£260 0 0	Lathey Bros.	£179 0 0
R. A. Jewell	200 0 0	F. Chidley & Co.	146 0 0
Hudson Bros.	190 0 0	E. B. Tucker*	137 15 0

Harwood-road.

J. & M. Patrick	£210	Hudson Bros	£143
R. A. Jewell	203	W. Hammond*	110
R. S. Ronald	200		

North End-road.

J. M. Patrick	£235	F. Chidley & Co.	£121
R. S. Ronald	150	W. Hammond*	106
Bristow & Eatwell	137		

Portobello-road.

G. H. Sealy	£185 10 0	Bristow & Eatwell	£127 10 0
H. C. Clifton	169 0 0	G. Neal	117 0 0
W. King & Son	148 0 0	F. T. Chinchen & Co.*	109 9 0
General Builders, Ltd.	139 0 0		

Saunders-road (old portion).

General Builders, Ltd.	£153 0 0	W. R. & A. Hide	£58 15 0
G. H. Sealy	97 10 0	Cowley & Drake	46 12 0
S. Polden	71 14 0	F. T. Chinchen & Co.*	37 0 0

"Victoria" (old School and J.M.).

Bristow & Eatwell	£165 0 0	Marchant & Hirst	£120 0 0
W. R. & A. Hide	124 15 0	S. Polden*	115 15 0

Saffron-hill.

T. Cruwys	£230 0 0	F. W. Harris	£139 0 0
H. Bouneau	190 0 0	M. Pearson	134 0 0
Marchant & Hirst	149 0 0	Stevens Bros.*	126 0 0
W. Chappell	140 0 0		

Station-road.

Patman & Fotheringham, Ltd.	£297	McCormick & Sons	£258
C. Dearing & Son	279	J. Grover & Son	163
T. Cruwys	270	A. Porter	146
		F. W. Harris*	139

Kender-street.

H. Leney & Son	£258 0	J. Appleby & Sons	£197 0
S. E. Musgrove	254 0	W. J. Howie	185 0
Enness Bros	214 0	J. & C. Bowyer	170 0
G. Kemp	210 0	C. G. Jones*	151 10

Mantle-road.

H. Leney & Son	£325 0	J. & C. Bowyer	£230 0
W. J. Howie	259 0	C. J. Jerrard	223 0
H. Groves	258 0	C. G. Jones*	214 17

Bonner-street.

W. Shurmur & Sons, Ltd.	£235 0 0	J. Haydon & Sons	£190 8 0
C. Willmott & Son	210 0 0	Barrett & Power	190 0 0
H. Bouneau	204 13 6	Marchant & Hirst*	189 0 0
H. R. Brown	203 0 0		
W. Silk & Son	193 10 0		

Curtain-road.

Parrott & Isom	£199 0	J. Haydon & Sons*	£148 15
J. Stewart	186 0		
Barrett & Power	174 0		

Seawell-street.

McCormick & Sons	£305 0 0	H. R. Brown	£239 0 0
G. Barker	297 0 0	C. Willmott & Son	229 0 0
Barrett & Power	276 0 0	Woollaston Bros.	210 0 0
A. Porter	239 0 0	H. Bouneau*	181 11 6

Hollydale-road.

J. Garrett & Son	£194	H. Groves	£158
W. J. Howie	182	Leonard & Mason*	148
W. Hooper	176	J. & C. Bowyer	120
Unsigned	167		

Sumner-road (main School and P.T. School).

E. P. Bulled & Co.	£381	W. Sayer & Son	£277
H. Groves	368	Holliday & Greenwood, Ltd.	252
W. V. Goad	341	Maxwell Bros., Ltd.	249
H. Line	333	W. Hooper*	235
G. Kemp	284		

Westmoreland-road.

Lathey Bros.	£149 0 0	Holliday & Greenwood, Ltd.	£103 0 0
W. Hooper	128 0 0	Maxwell Bros., Ltd.	97 0 0
W. Sayer & Son	112 0 0		
Leonard & Mason	106 15 0		

Wood's-road.

Unsigned	£259 0	Maxwell Bros., Ltd.*	£158 10
W. V. Goad	199 0	Wm. Hooper	152 0
G. Kemp	190 0	Holliday & Greenwood, Ltd.	135 0
Leonard & Mason	189 0		
J. & C. Bowyer	185 0		

TENDERS—*Continued on page 509.*

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COMPETITIONS, CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*New Church of Emmanuel, Liverpool	New Church Building Committee	Not stated	May 31
*Public Library	Peterborough Council	50*l.*, 25*l.*, and 15*l.*	June 30
*Shire Hall, Bury St. Edmunds	West Suffolk Standing Joint Comitt.	50*l.*, 30*l.*, 20*l.*	July 2

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Repairs, etc., Dallas United Free Church and Manse	.....	The Church	May 7
386 ft. of 9-in. Walling at Cemetery	Town Council of New Windsor	Borough Surveyor, Windsor	do.
School Buildings, etc., Shotten, co. Durham	Horden Collieries, Ltd.	J. M. Bottomley, Son, & Wellburn, Arch., 28, Albert-rd., Middlesboro'	do.
Concrete Quay, etc.	Pittenween Town Council	D. & C. Stevenson, 34, George-street, Edinburgh	do.
Painting Borough Hall and Sanitary Depot	Stafford Corporation	W. Blackshaw, Borough Hall, Stafford	May 9
Paintg. & Decoratg. Lodges, Cemetery, Manchester-rd.	Warrington Cemetery Committee	Borough Surveyor, Town Hall, Warrington	do.
Repairs, Technical Institute, Godalming	Technical Education Authority	Welman & Street, Architects, Church-street, Godalming	do.
Cottage, Tarras	.....	J. Beattie, Earlsmill, Forres	do.
Re-roofing Farm House, Tarras	.....	do.	do.
Repairs to Steading, Tarras	.....	do.	do.
Re-roofing Cottages, Hillhead	.....	do.	do.
Cottage, Pittendreich Mill	.....	do.	do.
Walls and Gates, Argyle-street, Council School	Ipswich Education Committee	J. Wittet, Architect, Elgin	do.
Detached House at Baildon	.....	E. T. Johns, Architect, Thoroughfare, Ipswich	do.
Painting, etc., Rooms, 7, Cyril-crescent, Cardiff	Roath Conservative Clubs	Walker & Collinson, Architects, Swan Arcade, Bradford	do.
4,000 Tons of Cement, Davyhulme Sewage Works	Manchester Rivers Committee	C. Lukins, Secretary	do.
Heating and Ventilation of Seedly Council School	Salford Education Committee	Secretary of Rivers Department, Town Hall, Manchester	do.
Street Works	Manchester Paving, etc., Committee	H. Lord, F.R.I.B.A., 42, Deansgate, Manchester	do.
5,000 Tons of Welsh Granite Setts	do.	Paving, etc., Dept. (Surveyor's Office), Town Hall, Manchester	do.
C.I. Verandah and Escape Staircases, New Infirmary	Stockport Guardians	Chief Clerk, Highways Department, Town Hall, Manchester	do.
Two Lancashire Boilers at New Infirmary	.....	W. H. Ward, Architect, Paradise-street, Birmingham	do.
Sewers, &c., at Hollin Hill, Clown	Clown R.D.C.	do.	do.
Re-seating, etc., Chapel of Ease at Redruth	.....	E. H. Barber, A.M.Inst., C.E., Clown, Chesterfield	do.
Hospital Ward, Nobles-green, Eastwood	Rochford R.D.C.	L. Winn, Architect, 11, Boscawen-street, Truro	do.
1,100 Yards c.i. Pipes, etc.	Llanelly U.D.C.	H. T. Sidwell, Surveyor, Rochford	do.
Horsekeeper's House, Doughty-road, Grimsby	Household Scavenging Sub-Comitt.	G. Watkeys, C.E., Town Hall, Llanelly	do.
Alterations, etc., to Premises	Alnwick and County Gazette Co.	H. Gilbert-Whyatt, Borough Engineer, Town Hall-sq., Grimsby	do.
Wood Paving Works	Kensington Borough Council	G. Reavell, Junior, A.R.I.B.A., Alnwick	do.
Repairs to Chimney Stacks at Workhouse	Cardiff Guardians	W. Weaver, Borough Engineer, Town Hall, High-st., Kensington	do.
Six Hill Cuttings and Building a Bridge, Woodburn	Larne R.D.C.	A. J. Harris, Clerk, Union Offices, Queen's-chambers, Cardiff	May 10
Concrete Flags	Rochdale General Purposes Com.	County Surveyor, County Court House, Belfast	do.
Road Macadam	Haverhill U.D.C.	S. S. Platt, M.Inst.C.E., Borough Surveyor, Rochdale	do.
Road Stone	Winsford U.D.C.	F. W. Knewstubb, Surveyor, Haverhill, Suffolk	do.
Painting, etc., Central Premises and Three Branches	Stafford Industrial Co-op. Society	J. Wilkinson, Surveyor, Winsford	do.
1,200 Tons of Guernsey Granite	Faversham R.D.C.	10, Salter-street, Stafford	do.
Wall to Sea Banks	West Hartlepool Corporation	J. G. Chittenden, District Surveyor, Ashford-road, Faversham	do.
Works at Auxiliary Asylum, Youghal	Cork District Lunatic Asylum	N. F. Dennis, Borough Engineer, West Hartlepool	do.
Cottages	Strabane R.D.C.	N. H. Hill & Son, Architects, 28, South-mall, Cork	do.
Dwelling-house, Grange Moor, Huddersfield	.....	Offices of the R.D.C., Strabane, Ireland	do.
Alterations at Workhouse	Blackburn Guardians	J. Berry, Architect, 3, Market-place, Huddersfield	do.
Drainage Works, Nairn	Nairn Town Council	F. C. Ruddle, Architect, 4, King-street, Blackburn	do.
Workmen's Hall and Institute, Mardy	.....	G. Gordon & Co., Civil Engineers, Inverness	May 11
Materials for Baths Department	Glasgow Corporation	E. Williams, Architect, Andrew's-buildings, Cardiff	do.
Arc Lamps, etc.	Southampton Corporation	W. Thomson, 187, George-street, Glasgow	do.
Rel'y'g Airing Yd. wi' Tar Asphalt, Crumpsall W'kh'se	Manchester Guardians	Borough Electrical Engineer, Southampton	do.
Shop for Electrical Repairs, Gateshead	N.E. Railway	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester	do.
Station Buildings, etc., at Dunston-on-Tyne	do.	W. Bell, Architect, Central Station, Newcastle-on-Tyne	do.
House, etc., Methlick, Scotland	Mr. W. Smith	do.	do.
Residence, Outwood, near Wakefield	.....	J. Cobban, Architect, Haddo House	do.
Deepening Harbours, etc., St. Monance	St. Monance Town Council	J. W. Gardiner, Thorpe-terrace, Outwood, near Wakefield	do.
Repair, etc., of Asphalte Paving	Glasgow Corporation	D. and C. Stevenson, Engineers, 84, George-street, Edinburgh	do.
Iron Roofing of Retort House, etc.	Renfrew Town Council	Office of Public Works, City-chambers, 64, Cochrane-st., Glasgow	do.
Painting Museum Buildings, Warrington	Museum Committee	Engineer at the Gasworks	do.
R'ds, Dr'ns, etc., Bourneville Est'e, W'st'n-Sup'r-Mare	.....	C. Madeley, Curator and Librarian, Warrington	May 12
Paving Works	Greenwich Borough Council	Wansbrough, Sons, & Garner, 67, High-street, Weston-Super-Mare	do.
Wharf Front, etc., Woolston, Southampton	.....	Borough Engineer and Surveyor, Town Hall, Greenwich-road, S.E.	do.
Widening Bow Bridge	Edinburgh & District Wat'r Trustees	E. Cooper Poole, A.M.Inst.C.E., 5, Portland-street, Southampton	do.
Stores, Fittings, etc., Electric Tramway Department	Southampton Corporation	W. A. Tait, C.E., 72A, George-street, Edinburgh	do.
House, Kilner's-park, Ulverston	Mr. C. J. Chapman	Traffic Manager, Above Bar, Southampton	do.
Thirty Seats, Prince's-parade	Bridlington Property Committee	Settle & Brundit, Architects, Ulverston	do.
Steel Service Tank at Tannochside	Lanark Middle Ward District Com.	Borough Surveyor, Town Hall, Bridlington	do.
Pier and Road at Salen, on the Sound of Mull	Directrs. of Salen (Mull) Pier Co., Ltd.	Crouch & Hogg, C.E., 53, Bothwell-street, Glasgow	do.
Rebuilding Bible Christian Chapel, Landkey	.....	J. Deas, C.E., 53, Bothwell-street, Glasgow	do.
120 Tons of Steel Rails, etc.	Manchester Cleansing Committee	J. C. Southcombe, Architect, Barnstaple	do.
*Covered Reservoir, Weston Hills, & 2 Miles of 8in. Main	First Garden City, Ltd.	R. Williamson, Town Hall, Manchester	do.
Softening Plant, etc., Otterbourne Waterworks	Southampton Corporation	G. R. Strachan, M.I.C.E., 7, Victoria-street, Westminster, S.W.	do.
Electricity Meters, etc.	Stoke-upon-Trent Corporation	Waterworks Engineer, 18 and 19, French-street, Southampton	May 13
Altering, etc., Old Bank Buildings into Offices, Pentre	Rhondda U.D.C.	P. J. S. Tiddeman, Field Places, Stoke-upon-Trent	do.
Broken Granite and Slag	Castle Donington R.D.C.	W. J. Jones, Engineer & Surveyor, Public Offices, Pentre, Rhondda	do.
Weigh Bridge, etc., at Power Station, Braywick-road	Maidenhead Corporation	F. E. Burton, Clerk, High-street, Castle Donington	do.
Christian Brothers' Schools, Fermoy	.....	C. O. Milton, Boro' Electrical Engineer, Power Stn., Maidenhead.	do.
Public Library, Bank-street, Annan	Annan Town Council	S. F. Hynes, F.R.I.B.A., 21, South Mall, Cork	do.
Alterations, etc., of Market and Public Hall Premises	do.	Town Clerk's Office, Annan, Scotland	do.
Church, Barnacre, near Garstang, Lancs.	.....	do.	do.
Twelve Houses at Risca	Messrs. Rees & Case	Austin & Paley, Architects, Lancaster	do.
Painting Two Gasholders in Tytherington	Macclesfield Gas Committee	C. Telford Evans, Architect, 8, Queen-street, Cardiff	May 14
Materials	do.	Mr. Newbigging, Engineer at the Works	do.
Wrought-Iron Fencing & Gates, St. Philip's Churchyd.	Sheffield Improvement Committee	do.	do.
Painting, etc., at Infirmary, Rackham-st., Notting Hill	St. Marylebone Board of Guardians	C. F. Wike, City Surveyor, Town Hall, Sheffield	do.
Semi-Dd. Villas, Birchw'd-rd., St. Anne's-pk., Bristol	.....	Steward of the Infirmary	do.
Extensions to Feeder and Distributing Mains	Birkenhead Corporation	H. C. H. Tarr, Architect and Surveyor, 10, St. Stephen-street, Bristol	do.
1,800 yds. of Cable	Canterbury Lighting Committee	W. Bates, Borough Electrical Engineer, Craven-street, Birkenhead	do.
Mild Steel Coal Bunkers, etc.	Aberdeen Electric Lighting Com.	Engineer, Electricity Works, Canterbury	do.
Street Works, Lyndale-road, Redhill	Reigate Town Council	J. A. Bell, City Electrical Engineer, Milburn-street, Aberdeen	do.
Villa, Aviemore	.....	F. T. Clayton, Borough Surveyor, Municipal-buildings, Reigate	do.
Pulling down, etc., No. 84, High-street	Guildford Town Council	G. Gordon & Co., Engineers and Architects, Inverness	do.
Offices at Town Hall	Leeds Corporation	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford	May 16
Painting, etc., Dead Meat-market	do.	City Engineer's Office, Leeds	do.
Sulphur Baths, Park-street, Ripon	Corporation of Ripon	do.	do.
Twelve Through Houses, Oldham-road, Rishworth	.....	S. Stead, Architect, Victoria-chambers, James-street, Harrogate	do.
An Ejector to work with compressed air	Wimbledon Urban District Council	R. Horsfall & Son, Architects, 22A, Commercial-street, Halifax	do.
950 ft. of Cast Iron Pipes	do.	C. H. Cooper, M.Inst.C.E., Council Offices, Broadway, Wimbledon	do.
		do.	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Additions, etc., to Moriah Chapel, Rhymney	.....	H. M. Thomas, 13, Moriah-street, Rhymney	May 16
Rebuilding Black Bull Inn, Ferryhill, Co. Durham	.....	S. Wilkinson, Architect, 30, Mosley-street, Newcastle-on-Tyne	do.
Single-phase Turbo-alternator	Bristol Electrical Committee	H. Fareday Procter, City Electrical Engineer, Temple Bks., Bristol	do.
Union Offices, Ashby-road	Loughborough Guardians	W. T. Hampson, Architect, Ashby-road, Loughborough	do.
*Whitewashing & Cleaning Int. Asyl., Cleveland-st., W.	Central London Sick Asylum Dist	Asylum, Cleveland-street, Fitzroy-square, W.	do.
*Painting, etc., N. Disp., Lisson-gr., & S. Disp., East-st.	St. Marylebone Guardians	A. Saxon Snell, F.R.I.B.A., 22, Southampton-bdgs., Chancery-la.	do.
Manager's House at Sewage Works, Denton	Denton U.D.C.	Mr. Barlow, A.R.I.B. ., Hanover-cham., 8, King-st., Manchester	do.
Retaining Walls, approach to Mouton Bridge	Eccles Parliamentary Committee	T. S. Picton, Boroug Surveyor, Town Hall, Eccles	May 17
Wrought-iron Railings	do.	do.	do.
Open-air Bath	Carnarvon Corporation	R. O. Roberts, Town Clerk, Guildhall, Carnarvon	do.
Drymen Drainage Works	Stirling County Council	Kyle & Frew, Engineers, 216, West George-street, Glasgow	do.
Water-tube Boilers, L.C.C. Tramways	The L.C.C.	County Hall, Spring-gardens, S.W.	do.
*Broken Granite	Brentford U.D.C.	Council Surveyor, Boston-road, Brentford	do.
*Paving Works	Corporation of London	Engineer to the Corporation, Guildhall, E.C.	do.
*Cemetery Chapel	Bromley Burial Board	Burial Board Offices, East-street, Bromley	do.
Fire Stairs to Infirmary Ward at Workhouse	Farnham Guardians	Friend & Lloyd, Architects, Grosvenor-road, Aldershot	May 18
Coke Conveying Machinery, etc.	Salford Gas Committee	W. W. Woodward, Gas Offices, Bloom-street, Salford	do.
Reinstating Carriageway, etc., Allbut-st., Cradley H'th	Rowley Regis U.D.C.	Council Offices, Lawrence-lane, Old Hill, Staffordshire	do.
400kw. Steam-driven Generator	Stretford U.D.C. Electricity Com.	T. L. Miller, M.Inst.C.E., 19, Brazennose-street, Manchester	do.
*Iron Fire Escape Staircases, etc., Eastern H'sp't'l, N.E.	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	do.
*Iron Fire Escape St're's's, etc., South-Western H'sp't'l	do.	do.	do.
*Making-up Woodlawn-road, Section III.	Borough of Fulham	Borough Surveyor, Town Hall, Fulham, S.W.	do.
*Making-up Macmurdo-road	do.	do.	do.
1,500 Tons of Lime	Birkenhead Corporation	T. O. Paterson, Gas Engineer	May 19
Three Cottages, Wareham	Mr. G. M. Marston	W. Watts Fookes, Architect, North-street, Wareham	do.
*New County Court Offices, Preston	Commissioners of H.M. Works, etc.	H.M. Office of Works, Storey's-gate, S.W.	do.
Mortuary at Cranleigh	Cranleigh Parish Council	F. W. Smith, Clerk to Council, Brookdene, Cranleigh	May 20
Outfall Sewer	Rugby U.D.C.	D. G. Macdonald, Surveyor to the Council, Rugby	May 21
Main Cables	Glasgow Corporation	W. A. Chamen, Engineer, 75, Waterloo-street, Glasgow	May 23
Electricity Meters	do.	do.	do.
Carbons	do.	do.	do.
Granite	Stevenage U.D.C.	W. O. Times, Clerk, U.D.C. Offices, Stevenage	do.
Granite Setts	Ince U.D.C.	A. T. Swain, Surveyor, Co. Offs., Ince Green-la., Ince, nr. Wigan.	do.
Forest-row Sewerage Works	East Grinstead R.D.C.	Bailey-Denton, Lawford & Symons, 9, Bridge-street, Westminster	May 24
Tramcars	Walthamstow U.D.C.	J. Enright, 68, Lincoln's Inn Fields, W.C.	May 29
Timber Wharf, etc.	Belfast Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast	May 30
*Enlargement of Isolation Hospital	Biggleswade Joint Hospital Board	H. Young, Architect, Bedford	May 31
*Head Post Office, Cheltenham	H.M. Office of Works	H.M. Office of Works, etc., Storey's-gate, S.W.	do.
Electricity Plant	Canterbury Lighting Committee	R. Hammond, M.Inst.C.E., 64, Victoria-street, Westminster	June 1
Repairs, etc., of Main Roads	Merioneth County Council	E. Vaughton, C.E., Arthog, Dolgelley	do.
Sewage Works, Brandon	Brandon and Byshottles U.D.C.	J. E. Parker, C.E., Post Office Chambers, Newcastle-on-Tyne	June 4
Renewal of Leadwork of Nave Roof of Whissendine Ch.	Vicar and Building Committee	Goddard & Co., Architects, 8, Market-street, Leicester	No date
Premises, 23, Widemarsh-street	Hereford Co-operative & Industrial Soc.	W. W. Robinson, Architect, 19, King-street, Hereford	do.
Alteration of Premises, St. Owen-street, Hereford	.....	W. E. H. Clarke, Arch. & Sur., Cathdl. Chbrs., King-st., Hereford	do.
160 yds., S'w'r M'k'g, etc., nr. Heaton-rd., M'nningh'm	.....	R. Armistead, Surveyor, 8, Charles-street, Bradford	do.
Soil Stripping and Excavating, Dudley Hill	.....	C. H. Hargreaves, Architect, Exchange, Bradford	do.
Out-buildings, etc., Hook Norton, School	The Governors	W. E. Mills, Architect, 12, Horse Fair, Banbury	do.
Decorative Works, Tolworth Joint Hospital	.....	Carter & Ashworth, Architects, 86, Eden-st., Kingston-on-Thames	do.
Reb'lding King's Arms Public H'se, Binstead, Alton	Messrs. Crowley & Co.	R. A. Crowley, A.R.I.B.A., 22, Tavistock-street, Strand, London.	do.
Parish R'm & S'nd'y Sch'ls, St. M'tth'w's Ch., Hull.	.....	J. M. Dossor, A.R.I.B.A., 2, Manor-street, Hull	do.
Severing	.....	F. Shore, 13, Clare-street, Bristol	do.
Stores	Abertillery U.D.C.	J. McBean, Surveyor, 1, King-street, Abertillery	do.
Two Br'k B'lt Semi-Det. Villas, Av. Est. Knaresboro'	.....	W. Driffield, Architect, Boroughbridge-road, Knaresborough	do.
15,000 yards of Post and Rail Fencing	.....	Bert, Pateley Bridge	do.
Painting and Gilding 4 Dials of Normanton Ch. Clock	.....	Mr. Kingston, 16, The Grove, Normanton	do.
Extension of Kipping Sunday School, Thornton	.....	W. Pickles, Architect, 60, New-road, Thornton	do.
Villa at Thornton	.....	do.	do.
Enlarging Gwehelog School, near Usk	.....	Lansdowne & Griggs, Architects, Newport, Mon.	do.
Plumber's Work at Eight Houses	.....	J. Pullan, Noster House, Beeston	do.
Six Cottages, etc., Snettisham, Norfolk	W. J. Lancaster	L. F. Eagleton, Architect, King-street, King's Lynn	do.
Six Cottages, etc., Ingaldisthorpe, Norfolk	do.	do.	do.
Outside Painting and Repairs to Chapel	.....	W. H. Potter, Pastor, Grundisburgh Baptist Chapel	do.
140 Yards Iron Hurdle Fencing	Horbury Working Men's Club	G. W. Bowers, Secretary, Horbury	do.
Semi-Detached Villa, near Chepstow	Mr. James Rose	Swash & Bain, Architects, Midland Bank-chambers, Newport, Mon.	do.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*General Foreman	Uxbridge R.D.C.	3*l.* weekly	No date.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, lv. *Contracts*, lv. vi. viii. x. *Public Appointments*, xx.

TENDERS—*Continued from page* 507.

LONDON SCHOOL BOARD—*Continued.*

Johanna-street.

T. L. Green	£155 10	G. Brittain	£125 0
J. F. Ford	133 0	J. R. Sims	123 0
Rice & Son	127 0	W. Hornett*	112 0

Burghley-road (all departments).

Cowley & Drake	£336 15 0	Marchant & Hirst	£257 0 0
T. Cruwys	280 0 0	Stevens Bros.*	242 0 0
J. Stewart	263 0 0		
G. Kirby	263 0 0		

Pocock-street.

T. L. Green	£338 0 0	W. Hornett	£221 0 0
Edwards & Medway	290 0 0	W. J. Coleman & Co.	200 0 0
J. Garrett & Son	249 0 0	Rice & Son	199 0 0
J. Appleby & Sons	246 0 0	J. F. Ford*	188 10 0

Townsend-street.

H. J. Williams	£273 10	Maxwell Bros, Ltd.	£198 0
J. Garrett & Son	253 0	Rice & Son	196 0
W. Sayer & Son	242 0	E. Triggs*	185 0
E. Proctor & Son	200 0		

Rutland-street.

J. F. Holliday	£238 12 0	Vigor & Co.	£152 0 0
R. Woollaston & Co.	204 0 0	G. Barker	148 10 0
A. J. Sheffield	198 0 0	Woollaston Bros.	135 0 0
A. Heard & Co.	178 10 0	H. Bouneau*	129 2 9

Webb-street.

H. J. Williams	£238	E. Proctor & Son	£205
J. Harries & Co.	230	Rice & Son	203
W. Sayer & Son	213	E. Triggs*	162

Portman-place (Boys' and Girls').

R. Woollaston & Co.	£299 0	W. Silk & Son	£237 0
G. Barker	255 0	H. Bouneau	191 12
J. F. Holliday	252 15	Vigor & Co.*	171 0

St. Paul's-road.

J. F. Holliday	£200 8 0	A. E. Symes	£160 0 0
R. Woollaston & Co.	178 0 0	Woollaston Bros.	160 0 0
J. Dolman & Co.	176 0 0	A. Heard & Co.	147 0 0
G. Barker	170 0 0	Vigor & Co.*	140 0 0
H. Bouneau	162 11 6		

Napier-street.

H. R. Brown	£199 0	W. Silk & Son	£177 10
J. Grover & Son	199 0	McCormick & Sons	175 0
G. Barker	194 0	Barrett & Power*	160 0
J. Stewart	191 0	Woollaston Bros.	130 0

Redvers-street.

G. Barker	£293 0 0	H. Bouneau	£211 14 0
Barrett & Power	278 0 0	J. Haydon & Sons	207 15 0
Marchant & Hirst	265 0 0	Stevens Bros.	198 0 0
H. Runham Brown	229 0 0	Woollaston Bros.*	190 0 0

Holland-street.

T. L. Green	£224 0 0	J. F. Ford	£119 0 0
J. Appleby & Sons	147 0 0	G. Brittain	117 0 0
Edwards & Medway	147 0 0	Rice & Son	115 0 0
W. Hornett	126 10 0	W. J. Coleman & Co.*	85 0 0

Mawbey-road.

E. P. Bulled & Co.	£341	H. J. Williams	£249
J. Garrett & Son	322	W. J. Howie	242
J. Appleby & Sons	285	E. Triggs	218
W. Sayer & Son	259	E. Proctor & Son*	204

Weston-street.

Unsigned	£232 10	J. Greenwood, Ltd.	£170 0
Wm. Sayer & Son	227 0	Rice & Son*	163 0
J. Harries & Co.	218 0	E. Proctor & Son	158 0

St. Leonard's-road.

A. J. Sheffield	£300 0	G. Barker	£269 0
J. F. Holliday	297 18	A. E. Symes	262 0
J. Haydon & Sons	275 5	J. Dolman & Co.	257 0
R. Woollaston & Co.	270 0	Vigor & Co.	257 0
		Woollaston Bros.*	220 0

LUTON.—For paving and other works in Ivy-road, Belmont-road, and New Town-street, for the Town Council. Mr. A. J. L. Evans, Borough Engineer and Surveyor:—

T. Adams	£1,160 0 0
T. Free & Sons	1,134 10 0
Pat. Vic. Stone Co.	1,085 2 9
G. Powdrill, Hitchin-road, Luton*	993 17 4
Wallis & Inns (part only)	955 10 6

NORTHWICH.—For making road and laying sewer, for Northwich Rural and Northwich, Middlewich, and Winsford Urban Hospital Committee. Mr. J. Cawley, architect, Northwich:—

S. White & Co.	£213 10 6	E. W. Bostock	£145 0 0
F. Mitchell & Sons	201 19 0	J. Johnson	138 18 0
Birchall Bros.	165 6 0	S. Hutton	130 0 0
T. Rowlands	151 0 0	J. Dale, Northwich*	129 0 0

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NORWICH.—For alterations and additions to Surrey-road Schools, for the Education Committee. Mr. C. J. Brown, architect and surveyor, Cathedral Offices, Lower-close, Norwich :—

W. E. Bird....	£279	0 0	A. D. Boddy & Son	£215	0 0
J. Wilson	272	5 0	W. Woodward	200	0 0
S. Chapman & Son	229	0 0	W. J. Hannant	199	10 0
A. S. Lincoln ..	221	0 0	J. Burton & Son	192	10 0
Downing Bros.	218	10 0	A. C. Taylor, St. Augustines*	170	0 0
F. R. Hipperson	215	7 0			

NORWICH.—For new residence for Mr. P. N. Etheridge, Newmarket-road, Norwich :—
S. W. Utting, Sandringham-road, Norwich*.. £930

OTLEY.—For earthenware-pipe sewers, stormwater-overflow, and surface-water drains, Newall sewerage, for the Urban District Council. Mr. J. E. Sharpe, engineer and surveyor, Otley :—

J. Hannam ..	£3,373	7 1	W. Morley & Sons	£2,824	9 10
A. & C. Harris	3,317	8 7	E. Kellett ..	2,797	14 5
B. Oxley	3,304	15 5	H. E. Buckley, Bingley*	2,637	7 2
Ward & Tetley	3,237	5 1			
W. Brigg	2,879	3 7			
Barker Bros..	2,839	1 1			

[Estimate, £2,773 7s. 2d.]

PENYGROES (Wales).—For additional buildings for scientific and technical instruction at County School, for the Local Governing Body. Mr. R. Lloyd Jones, County Architect :—
O. T. Williams, 66, County-road, Penygroes..£1,320
[Six tenders received.]

PRESTON (Lancs.).—For paving, etc., Skeffington-road, for the Corporation :—
Chadwick Bros., 160, Whalley-road, Blackburn* £372 0 3

RENWICK (Carlisle).—For rebuilding Wesleyan chapel, for the trustees. Mr. H. Higginson, architect, 3, Lonsdale-street, Carlisle. Quantities by the architect :—

Builder: H. Dryden, Renwick ..	£413	5 0	Subject to certain schedule deductions.
Joiner: J. Dixon, Renwick	320	0 0	
Plumber: Jackson & Son, Penrith	115	3 2	
Plasterer: Jackson & Son, Penrith			
Painter: Jackson & Son, Penrith			
Slater: J. T. Kellett, Carlisle ..	36	0 0	

SHEFFIELD.—For the erection of a free library at the corner of Walkley-road and South-road, for the Sheffield Corporation. Mr. H. L. Paterson, architect, 19, St. James's-street, Sheffield :—
D. O'Neill & Son, Bower-road, Sheffield* £3,259 10 0

SWANSEA.—For tarpaving the Hafod, Brynhyfryd, and St. Helen's Board Schools, for the United District School Board. Mr. G. E. T. Laurence, architect, Chandos-chambers, 22, Buckingham-street, Adelphi, S.W. :—

	Per yd. super. s. d.		Per yd. super. s. d.
S. Deeley	2 9	J. Wainwright & Co., Ltd.	1 11‡
C. Bradshaw & Son	2 9	North Wales Asphalte Co. ..	1 11
J. Smart	2 6‡	Roger & Lowe, Ltd.	1 10
E. B. Burgess	2 6‡	W. Sheppard	1 9‡
Asphaltes United..	2 1‡	La Brae Asphalte Co., Birmingham*	1 8‡‡
F. G. Sheppard ..	2 1		
Asphaltic Limestone Co.	2 0‡		
North of England Asphalte Co. ..	1 11‡‡		

[Brynhyfryd School, 3,955 yards super.: Hafod School, 4,241 yards super.; St. Helen's School, 2,034 yards super.]
‡ £3 13s. 6d. for preparation of contract for each school.

SWINDON.—For erecting stables and coach-house at the New Inn, Cromwell-street, for Messrs. T. & J. Arkell, Kingsdown Brewery. Messrs. William Drew & Sons, architects, Regent-circus, Swindon :—

C. Williams	£816	8 9	Tydeman Bros.	£742	10 0
A. J. Colborne..	762	0 0	J. Lay	707	8 0
J. G. Norman ..	760	0 0	S. Ogbourne* .	663	0 0

[All of Swindon.]

SWINDON.—For the erection of a lodge at the Queen Victoria Hospital. Messrs. William Drew & Sons, architects, Regent Circus, Swindon. Quantities by the architects :—

S. Chambers ..	£509	6 6	H. & C. Spackman.....	£445	0 0
W. Warren	491	18 6	A. J. Colborne	439	11 0
J. Williams....	474	0 0	J. G. Norman*	417	0 0

[All of Swindon.]

SWINDON.—For the erection of a workshop at the Swindon Advertiser Offices, Victoria Road for Messrs. Morris Bros. Messrs. William Drew & Sons, Regent-circus, Swindon, architects :—

W. Panting.....	£385	10	J. G. Norman ..	£325	0
Tydeman Bros. ..	360	0	A. J. Colborne ..	309	12
W. Warren.....	358	0	R. J. Leighfield*	277	10

[All of Swindon].

SWINTON.—For making-up Adwick-road and Spencer-street, for the Urban District Council. Mr. R. Fowler, Surveyor, Council Offices, Swinton, near Rotherham. Quantities by Surveyor :—

Adwick-road.
H. Wake, Brinsworth, Rotherham £100
Spencer-street.
H. Wake, Brinsworth, Rotherham £181

TAIBACH.—For the erection of shop and premises Taibach, Port Talbot, for Mr. W. R. Hanford. Mr. Frank B. Smith, architect and surveyor, Port Talbot :—

J. Nicholas ..	£1,390	0 0	S. Rees	£1,182	13 3
Price Bros. ..	1,275	0 0	M. Cox, Port Talbot* ..	1,143	0 0
J. Lake.....	1,239	10 7			
J. Davies....	1,210	0 0			

WATCHFIELD (Berks.).—For erecting a bowling alley at the Royal Oak Inn, for Messrs. R. B. Bowley & Co., Ltd. Messrs. William Drew & Sons, architects, Regent-circus, Swindon :—
John Lay, Swindon* £255 18
[No competition.]

WIMBLEDON.—For making up roads, for the Urban District Council. Mr. C. H. Cooper, Engineer and Surveyor, Council Offices, The Broadway, Wimbledon :—

Alwyne-road	E. Iles, jun., 54,	£915
Belvedere-grove, Sect. 1	North-road, Wimbledon*	221
do. do. 2		595
Church-hill	J. Mowlem & Co., Grosvenor Wharf, Westm'ster, S.W.*	860

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The Builder.

VOL. LXXXVI.—No. 3197. MAY 14, 1904.

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House at Wimbledon and House at Bickley .....Mr. Ernest Newton, Architect.
"Bibsworth," Worcestershire .....Mr. E. Guy Dawber, Architect.
"Brahan," Perth .....Messrs. Bedford and Kitson, Architects.
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Architecture at the Paris Salon.

As usual, the central and most important exhibit in the architectural galleries of the Salon is a great scheme of restoration of classic buildings. This is M. Patouillard's "Etat actuel et restauration de l'Ile Tiberine, à Rome," the drawings of which, along with various sketches of ancient monuments in Greece and Italy, fill the greater part of one room. Although in this, as in other similar exhibits in former years, there is a great deal that is purely imaginative, M. Patouillard's restoration is of more interest than most that we have seen, both from the ability and effectiveness of the drawings, the peculiar nature of the subject, and from one or two interesting items among what may be called the documents on which the restoration is based.

The author's scheme and argument are briefly explained on a written card placed beneath the principal drawing. The Insula Tiberinus, now Isola San Bartolomeo, is a long narrow island, running to a point at each end, and reached from the opposite banks by two ancient bridges, the Pons Fabricius (Ponte Quattro Capi) on one side, and the Pons Cestius (Ponte San Bartolomeo) on the other side, facing each other near the middle of the island. The tradition is that, 293 B.C., an appeal to an oracle in respect of a pestilence was answered by a counsel to build a temple to Æsculapius on this island; that this was done, and that the temple stood near one end of the island, where now stands the mediæval church of San Bartolomeo. Furthermore, that to give importance to so sacred and important a spot, the island was built all round with a revêtement of masonry, and that, in view of its form, somewhat approaching to that of a long ship in plan, it was treated accordingly, and finished at the end near the temple in the likeness of the prow of a galley on a large scale, as if it were a great ship anchored in the stream. Not a trace of this treatment is left now, but the author exhibits a remarkable engraving by Piranesi showing unmistakably a part of the prow and some of the heavy rusticated masonry beyond it, as it existed in his time. Another of M. Patouillard's documents is a copy of a small drawing in the Orsini collection in the Vatican Library, which is labelled with the name of the island, and shows it in a ship form—far too pronounced, with its rising stem and stern, to be accepted as a literal representation; it is such a representation as one expects to find on a coin; but still there it is, the island in a ship form, with the two bridges indicated. On the "deck" of the ship, in this drawing, is shown a circular building near each end, accompanied by columned and pedimented screens in front of them; the circular building on the right is shown as colonnaded, that on the left is without an order. In the centre rises an obelisk. If M. Patouillard attaches any importance to this drawing as a piece of evidence, it is odd that he should have entirely neglected the suggestion of the circular temple at the right hand end, where no such feature is shown in his restoration: He accepts, however, the obelisk; and the suggestion of the circular building at the left hand end appears in the form of a circular turret, of more lofty proportions, close up to what would be the "stern" of the galley; but it is hardly the kind of feature which the Orsini drawing suggests.

In his brief statement the author does not cite his authorities from ancient literature, though referring to them as existing; and, writing this out of reach of any available sources of reference, we are not in a position at the moment to form a decisive opinion on the assumption on which his restoration is founded, except so far as regards the Orsini and Piranesi drawings just referred to; we may return to the subject of the archæological history of the Tiberine island on another occasion, when we can treat it fully. In the meantime, we can only describe what M. Patouillard shows us: He has an exceedingly fine and learned perspective drawing, taken from a high point of site, showing the island surrounded by the revêtement of rusticated masonry with a terrace all round; the near end of it built up in the form of the prow of a galley, and near this end the temple of Æsculapius, a hexastyle Corinthian peripteral temple parallel with the long axis of the island, the entrance facing towards the island, with an open square before it in the centre of which is an obelisk on the axial line. The temple and the square occupy almost exactly the position of the present church of San Bartolomeo and its fore-court; and how probable it is that a later church should be built nearly on the lines of a Pagan temple formerly occupying the site we of course know from many

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instances. Facing the large temple, on the further side of the open space, is the small tetrastyle temple of Jupiter Jurarius—Jupiter in his capacity of presider over the fulfilment of oaths; and the remainder of the plan is occupied by a number of buildings symmetrically arranged, but of which the names and purport cannot be discerned at the height at which the plan is hung; the round turret before mentioned coming in at the rear. The end or prow of the island, behind and on each side of the Æsculapius temple, is occupied (as in such a case it undoubtedly would have been) by a crowd of votive altars and statues, and the river-god Tiber reclines on a long pedestal at the prow. The buildings along the margin of the island are shown as walled up, with engaged orders of pilasters, the spaces between occupied by mural inscriptions, and openings in the upper portion filled in with the well-known Roman form of cross-barred balustrading. The huge perspective view is of course accompanied by complete sections, plan, and elevations finished in the most elaborate manner; and the whole, whatever we may think as to its archæological probability, is a magnificent conception shown in a splendid set of drawings. The author's artistic abilities are further illustrated by a series of vigorous and effective water-colour drawings in Athens, Pompeii, and elsewhere. It is fortunate for M. Patouillard that he lives in a country where such talent as he displays is certain to be recognised and rewarded by commissions from a Government which never forgets an able and painstaking architect.

Apart from this great set of drawings, restorations are less numerous than usual. M. Girod shows a large drawing of the restored interior of a chamber in the Abbey of St. Germain-des-Prés, of Louis Treize epoch, which is a good piece of work, though we doubt the probability of the decorative painting of ceiling rafters shown, which looks more like modern French than like any possible Renaissance work; and M. Bourgeois exhibits two very elaborate historical drawings, intended as a parallel of the forms of civil, religious, and domestic architecture in France and Belgium "à travers les differents siècles," though the period embraced is really a very limited one. The two drawings each show one side of a *Place* lined with imaginary buildings of different dates, in elevation, but so coloured and treated as to have a pictorial effect. Each drawing is accompanied by a lengthy written analysis at the foot, in very small writing. It suggests one way of illustrating architectural history, by a combination of drawing and written analysis, and evidently represents a good deal of labour and thought, but it is a kind of thing which can hardly be studied to any purpose on the walls of an exhibition.

There are, as usual, a number of those ambitious *projets* for buildings which no one expects to see carried out, and a good many of which are probably the result of Ecole des Beaux-Arts competitions. Many of these serve at once to show how complete is the training received by French architects, and how mechanical may be the architecture resulting from such a scholastic system. M. Bouchet's "Une Gare Centrale de chemin de fer à Paris," a vast erection nearly all in glass and iron, is an admirable piece of constructional work, but absolutely devoid of the architectural effect which might be obtained in a great railway station. Another railway scheme which is equally unattractive architecturally, nevertheless deserves attention for its able and thorough working out of a practical problem; this is M. Jouven's "Un Centre Urbain," an idea evidently suggested by the work at present going on in Paris for the junction of the various metropolitan lines. M. Jouven shows a central station with three underground stories reached by lifts; the first of offices; the second a set of railways in arched tunnels with flat floors; the third, railways in tunnels of complete elliptical section. The plan shows the various lines of railway starting diagonally in four directions to serve all parts of the city; the scheme is very completely worked in elaborate sectional drawings; the buildings above ground, it must be admitted, have nothing to recommend them architecturally, but in a practical sense the whole is very cleverly thought out. Two or three large designs for an "Escalier de Musée" evidently represent a recent "Ecole" competition subject, and one of them, by M. Payret-Dortail (pupil of M. Laloux), in a vigorous treatment of French Renaissance, is a really fine design shown in an admirable set of drawings. Some of the details are rather too *rococo* in feeling, but the whole design is dignified and effective, with some originality and what one may call a great style about it. One cannot help wondering why it is that drawings produced for Royal Academy architectural prizes are for the most part so timid in style and execution compared with a set of drawings like this. The Academy set very good subjects sometimes, but the atmosphere seems to be different, and the sets of drawings produced would be nowhere beside the best examples of Ecole competition drawings. A design by M. Hébrard (pupil of M. Scellier de Gisors) for "Un Palais de l'Automobile" (does anyone really require such an establishment?), seems an inspiration from the Palais des Beaux-Arts, equally good in its refined and dignified treatment of the Classic order, and equally spoiled by an enormous and portentous glass roof, even bigger than that of the Palais. M. Fougerousse (pupil of M. Deglane) exhibits a very fine study for "Une Place Publique"; a fine colonnaded block at the top, with flanking terraces terminating at the front angle in a quarter circle worked into a picturesquely treated cupola above; the whole would make a really fine piece of city architecture to surround a large square. The design by M. Blondel for "Eglise Paroissiale pour la ville de X" one may conclude to be only a *projet*; as a design for a parish church it is a depressing example of the sort of architecture which seems to be regarded in France as suitable for a church—a kind of bastard Romanesque, as cold, hard, and deficient in charm as can be well imagined. Our imitation Gothic is better than this; or is it all matter of association, and could one learn to like it?

It is satisfactory to find that architectural exhibits at the Salon now include a far larger proportion of buildings actually carried out, or to be carried out, than was formerly the case. Ten years ago, in fact, one could hardly find any drawings representing the actual practical architecture of the day; nothing was to be seen but *projets* and drawings of ancient work. The latter still form a very large proportion of the show, but this year the illustrations of practical architecture are more numerous than we remember to have seen them before, and include some very interesting work. There are but two models this year, and not large ones. One of these is M. Lafore's monument to soldiers killed "Dans les Défilés d'El Moungar"; a fine design showing a lofty stele or obelisk crowned with a funeral urn, with a spirited draped female figure in front brandishing a sword. The other model is that of a funeral chapel in the Cimetière du Nord, by M. Boiret. This is a very "Art nouveau" affair, all ellipses; an elliptical arch in front, broken at the foot to allow passage to the entrance door; a short stumpy column rises from each foot of the curve, supporting at the top a square die worked out from the intrados of the elliptic arch; between the columns are the metal gates of the chapel. The elliptical archivolt is repeated on each face, and the whole crowned with an odd-shaped cupola in which elliptical lines again predominate. A huge palm-leaf, probably intended to be of gilt bronze, is applied in a spiral line to each of the front columns. The whole thing is original, but rather ingenious than beautiful. Among funeral monuments may be mentioned also the large drawing by M. Laroque, "Tombeau d'un Musicien," a marble stele with a bronze bust in front, and a lyre and other emblems worked on the face and base of the stele; the inscription on the monument states that it is to the memory of "Boullard, Fondateur de la Lyre Moulinoise"; apparently a local genius.

A piece of exceedingly practical architecture is illustrated in the set of large drawings of the "Usine Génératrice de la Compagnie du Chemin-de-fer Metropolitain," by M. Friesé. This is a long engine-house of immense size, with six great brick chimneys arranged in pairs on opposite sides of the building, two at each end and two in the centre; the end elevation is an imposing piece of brickwork, with a great arched window in the centre, and the two chimneys rising from corbelled bases at each side of the gable; the effect would have been still better, however, if their lines had been brought down to the ground. The administrative building, treated in a different and less massive manner, forms a separate block across one end of the engine-house. It is needless to add that complete sections, showing all the details of the machinery, are included in the drawings.

Among designs showing civic architecture is the design for the Chamber of Commerce at Roanne, by M. Blanvillain, in collaboration with M. Liault. This is an important building in the best style of modern French Renaissance: it is on an angle site with an elliptical angle vestibule finishing in an angle

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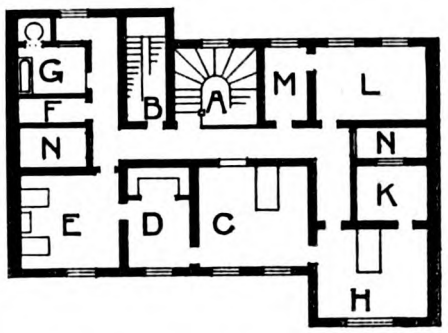
cupola above; it shows a rusticated ground story, and upper stories with a considerable expanse of plain masonry, the first and second windows grouped in pairs into one design, with a carved panel separating them; the arrangement of the plan is both practical and effective. Another good civic building is M. Toussaint's "Caisse d'Epargne," at Pont-à-Mousson. As an instance of the manner in which national characteristics are reflected in architecture, one may notice how consonant it is with the peculiarly thrifty character of the French middle and lower classes that Savings Banks are among the most numerous class of public erections in France; the erection of a new "Caisse d'Epargne" in this or that town is one of the most frequent items of news we have to chronicle under the head of "France." M. Toussaint's building also is in the best style of modern French classic, severe and restrained in treatment. Among the examples of modern classic buildings one of the best is a private residence at Neuilly, by M. Bouwens van der Boyen, an architect whose name is well-known to many of our readers. For a classic villa in a first-class suburb this is quite a model design. The centre block, with a strongly-marked cornice, is divided into a centre and side compartments by four broad flat pilasters stopping against the architrave of the entablature, in the spaces between which the windows are grouped in two stories, the centre space in the upper story occupied by an inscription tablet within a garland; the lesser buildings form symmetrical one-story wings on each side of the centre block; the details are very refined and well considered, and without showing any startling originality, the result is a thoroughly satisfactory design. In the same category of severe classic design is M. Rives's residence in Rue Villaret-Joyeuse; and with these temperate and refined fronts one may contrast M. Périn's "House in flats at low rentals" on Boulevard Brune, a specimen of "Art Nouveau" in all its glory. The ground story is in stone, with yellow brick above, and a huge white coved cornice (stopped by projections at each end of the front) along which realistic green leafage meanders; similar leafage climbs about other portions of the front (what it is made of is not apparent), and the entrance is flanked by terminal figures the lines of which seem modelled from a corkscrew. Better the regulation classic than this kind of originality. That French architects can employ classic details, or what pass for such, with very coarse and commonplace results, is however unfortunately proved in M. Piquart's Municipal College at Châlons, with its huge finials over the cornice like the heads of nine-pins, and the segmental-arched cloister round the quadrangle. There is no form more unattractive for an arched cloister than a series of segmental arches of very slight rise; a warning to be noted. M. Renou's "Projet de Restauration du Château de Beauregard" may come under the head of practical work, as it includes considerable additions to and remodelling of an old château, of which the plan is at present in this form ⌐ but which is to be altered to ¬. A good point in the ground-floor plan is that half the long block, the half next the courtyard, is occupied by a wide "Portrait-gallery" the whole length of the court front, which is not only a fine internal feature in itself, but serves as intercommunication, in place of the less dignified and more commonplace passage or corridor. On the upper floor the two wings are specially planned, the left-hand one as the family wing, with the parents', governess's, and children's rooms in the same corridor; the right-hand one as the privileged guests' wing—"Des Amis." Another private house, designed by M. Hocherau in collaboration with M. Paul Nelson, shows such an excellent piece of planning on the upper floor, and one so characteristic of the arrangements of a French private residence of the better class, that we give a rough sketch of the plan as far as it could be taken down rapidly in a note-book. A is the main staircase; B the service



stair, shut off by a door. C is Madame's room, D her *toilette* (for the ablutions and dressing are carried on in a separate room in a modern French house), with a large hanging cupboard (*Penderie*) at the upper end. E is the children's bedroom, with direct communication with Madame's room; no French lady, however *mondaine*, will let her children out of her direct care and inspection (a matter in which French fashionable ladies might give a lesson to many English ones); F is the linen closet; G the children's bath-room. On the other wing we have Monsieur's bedroom (H), and his *toilette* (K); L is his study; M a waiting-room for anyone who has to see him on business. N N are areas for light, the walls on each side being party-walls. Except the odd little kink at the end of the corridor next the bath-room, the object of which is not very apparent, this is about as compact and well-arranged a plan as could be for its purpose. The front elevation is another example of graceful and refined classic treatment, expressive of the best style of private residence.

The old style of French "Maison de Campagne," with its familiar congeries of timber gables and barge-boards at all angles, seems to be fortunately getting out of favour; at least we only noticed one example this year, though that one was of the most rampant description. Among designs of this class which show some special interest is that entitled "Une Villa Dans un Pays Chaud (Pour un Collectionneur)," though the title is only given in this general manner, appears like a real house, or might be one. The special features are that the exterior is finished white and decorated with figured friezes, which look like sgraffito; the principal bedroom is contained in a central erection rising above the rest, commanding air on all sides and with very extended eaves to keep the sun off the walls; and the special needs of a "collectionneur" are provided for by a large one-story wing in three square compartments, two for painting and the centre one for sculpture, and each top-lighted by a dome. M. Cochet is the architect; if it is not a house actually carried out, it is at all events of interest as a suggestion. Another interesting building among the minor works illustrated is the new "Groupe Scolaire" at Ivry-Port, by M. Despeyroux. The schools are one-storied buildings with a double roof and large mullioned windows; the interiors of the rooms have green tiled skirting and walls of a very light blue up to the top of the door-casings, with a graceful foliage ornament bounded by curved lines, forming a kind of frieze between the door heads; the walls white above this. Some pen sketches of constructional details are added; the whole is a very good and sensible piece of work. We may notice also M. Antoine's village church in Picardy, a curious and characteristic design in a kind of very severe quasi-Byzantine style; a stone plinth, dark red brick walls over, and circular windows set in a stone *encadrement* amid the brickwork. M. Bentz's "Eglise St. Joseph" (we are not told where) is in that kind of modern French-Byzantine style which was specially worked out by the late M. Vaudremer, and of which the most typical example is his church at Auteuil (more than once illustrated in our pages); the design is good of its type, but we do not love the type, nor understand the French fancy for it. M. Rives, whose Hôtel in the Rue Villaret-Joyeuse we have mentioned, exhibits with it a very fine water-colour drawing of an idea for a grand staircase, or rather, staircase hall—"Départ d'un Escalier," showing an interior of the most sumptuous description, with gilded balustrade, coloured marble panelling and sculpture, the whole rendered more effective by a brilliant flood of light cast over part of the picture from an unseen window, the rest being left in comparative shadow. As a study of architectural effect in water-colour it is one of the finest drawings we have seen.

Drawings illustrative of existing monuments are so numerous that they probably form a numerical half of the exhibits, though not occupying a proportionate space, as many of them are small. Among the most noteworthy are M. Fonseca's fifteen coloured drawings of the sculpture of the Cnidian friezes at Delphi; M. Tièche's large and fine coloured interiors of the Opera House and of some of the older Parisian churches; M. Brunet's three large frames of small sketches, "Croquis et Impressions de Voyage," very good of their kind—the sketches include a good many English subjects; M. Guidetti's water-colour sketches on the Acropolis, showing forcibly the effect of the ancient marble under strong sunlight; M. le Tourneau's drawings of the Byzantine crosses at the ancient churches of Kalabaka and Nojarelli, and also very fine views of the buildings themselves; and M. Chauvallon's water-

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colour views of the ancient ramparts of Menneton-sur-Cher.

The new Salon, though it professes to have an Architectural Section, contains, as usual, nothing that is worth comment under that head, the architects at all events appearing to be faithful in a body to the Old Salon; and the specimens of furniture design, grouped in bays round part of the staircase hall, are so far inferior to the best of our work of the same class that they have little interest for an English visitor.

WORKMEN'S COMPENSATION.

THE Court of Appeal have again been sitting to hear Workmen's Compensation Appeals, and several decisions of interest to the building trade have already been given. Builders should especially note the case of Brindle *v.* Jones (the *Builder*, April 16, p. 419). A private dwelling-house was being whitewashed and repaired, and for this purpose three men each had a separate ladder placed against one of the gables, and in the process one of these men sustained injury. At the time he was injured a step-ladder was in the area supporting a plank the other end of which rested on a wall. This step-ladder and plank were not in use at the time of the accident, but had been so placed to carry out some part of the process. The County Court Judge had found as a fact that this was a scaffolding, and the Court of Appeal, on the authority of the decision of the House of Lords in Hoddinott *v.* Newton Chambers and Co., have held that, since no connexion is necessary between the workman and the scaffolding, the employers are liable, this being a building repaired by means of a scaffolding. It may be remembered that in the case of Maude *v.* Brook, decided in 1900, the present Master of the Rolls dissented from the majority of the Court, and held that there must be some connexion between the scaffolding and the accident. In that case a man fell down the well of a staircase, and the only "scaffolding" on the premises consisted of some planks placed on trestles in an attic remote from the place of accident. The House of Lords in Hoddinott *v.* Newton Chambers and Co. did not agree with the view expressed by the Master of the Rolls, but held that there need be no connexion between the scaffolding and the accident, since the use of scaffolding was only inserted in the Act to form an artificial line of demarcation between employment on certain buildings, to exempt certain classes of buildings, and possibly certain classes of builders. If the height of the scaffolding had to be commensurate with the height of the building, such a line of demarcation would have a logical basis; but, since this is not necessary, and even a plank placed on two trestles is deemed to be scaffolding, the law appears in a very unsatisfactory state, and as far as the injured workman is concerned it is immaterial whether the particular work on which he is engaged necessitates scaffolding being used or not.

In the case of Andrew *v.* Failsworth Industrial Society Limited (the *Builder*, April 16, p. 420) the Court of Appeal have held that a bricklayer engaged on a house above 30 ft. in height and being constructed by means of scaffolding, who was killed by lightning, was killed by an accident arising out of the course of his employment.

In the case of Dyer *v.* Swift Cycle Company a man had injured his finger in cleaning a bicycle. There was no machinery driven by mechanical power on the premises, which were used for the purpose of showing or selling bicycles and upon which certain repairs were effected; and the only ground on which the employers had been held liable was that the premises constituted a building exceeding 30 ft. in height where more than twenty persons, not being domestic servants, were employed, which, it was contended, rendered the premises a factory within section 105 of the Factory and Workshops Act 1901. The Court negatived this contention, since the section only enacts that such premises shall be deemed to be a factory for the purpose of enforcing certain provisions of the Factory Act, and does not cause them to be factories, as is the case in relation to docks, wharves, quays, and warehouses. The premises might have been a warehouse, but the Court declined to entertain this question, since it had not been raised before the arbitrator.

In the case of Norman and Burt *v.* Walder (the *Builder*, April 16, p. 419) a novel contention was raised that where a workman who had suffered injury in the course of his employment and had received weekly payments in respect of such injury subsequently set himself up in business, the earnings or profits derived from such business could not be taken into consideration so as to enable his employers to claim a review to reduce the amount so paid him as compensation. The County Court Judge had adopted this view, but the Court of Appeal reversed this finding and sent the case back for the County Court Judge to ascertain what were the profits derived from the business, and what profits were to be attributed to the man's own exertions in the business as apart from those of other members of his family employed by him. The Court pointed out that, although paragraph 1*b* of the First Schedule implies that a man must have been earning wages from an employer to obtain compensation under the Act, paragraph 2, which deals with the man's earning power after the accident, cannot be so limited, but the words "the amount he is able to earn after the accident" are wide enough to embrace trade profits.

A curious point as to dependency arose in the case of Wainwright *v.* C. and H. Crichton. The claim was made on behalf of a man aged 64 and his wife, who claimed to be entitled to compensation by reason of the death of a son by accident, and as wholly dependent upon him. The father, a boiler-maker, suffered from lumbago or pain in the back, the result of having been stabbed some time ago. It was alleged that on March 10 the son had entered into an agreement to maintain his father, and that on that date the man ceased work and had never resumed work until the son died on May 11, from the result of an accident which occurred on April 4. The father was shown to have been earning over 2*l.* a week from November to March, when he ceased work, and medical evidence was tendered to show he was still capable of working. The County Court Judge held he was debarred by law from admitting such evidence on the authority of a case (Price *v.* Penrikyber New Colliery Company) in which it was decided that the time of death was the time at which dependency must exist, and that a sum received by a dependant after the death of deceased out of earnings saved by him was not to be taken into account. The Court of Appeal reversed this holding and said the evidence should be admitted; the distinction between the two cases is very apparent, the evidence here being directed to the earning power of the dependant at the time of his son's death, and not, as in Price's case, to the position of the dependant after the death from a wholly extraneous circumstance.

NOTES.

The Proposed Thames Barrage. WE are glad to find from a report of the Special Committee of the City Corporation on the Port of London that the scheme for the dockisation of the Thames from Richmond to Gravesend has been taken into serious consideration. As our readers may be aware, the scheme in question contemplates the construction of a regulating barrage similar to those across the Nile, so as to hold up the river to Trinity high-water level. The chief advantages to be derived from such a work are that the river would be converted into a lake of pure water served by numerous affluents, the principal being, of course, the flow over Teddington Weir, and that the current would flow in a downward direction only. It is believed that within a few weeks after the closing of the dam the upland waters would have forced over or through the dam all the foul waters of the river, which are now carried to and fro by tidal action, and that thenceforward the water would be of as good quality as that in the upper reaches of the river. Although not committing themselves to the expression of any definite opinion as to the merits of the scheme, the Committee urge that its practicability should be fully and impartially investigated, and that the Board of Trade should be invited to hold a public inquiry on the subject. It is satisfactory to note that this recommendation has been adopted by the Corporation, and that communications have already been opened on the matter with other public authorities in the metropolitan district.

The Recent Judgment in the House of Lords. LAST week we commented on the main subject of the judgment of the House of Lords in the case of the Home and Colonial Stores *v.* Colls. In addition, however, to the chief question involved there are expressions of opinion in this judgment on two other points which are noteworthy. One is the strong enunciation of opinion by Lord Macnaghten that the Court should, whenever possible, award damages for interference with a right to light and not order an injunction. We have over and over again called attention to the importance of a change in the law whereby

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it shall be incumbent on a Court to award damages and not issue an injunction, except in very exceptional cases. It is satisfactory to find this view supported in this recent judgment, and we trust that next session the Institute of Architects will obtain the introduction of a Bill on the point. Fortified by this judgment the Institute might well ask the Government to introduce a short Bill. The second point is the expression of opinion that the Court of First Instance should, if possible, obtain the view of a skilled architect or surveyor as to the results of an infringement of a right to light. Here again this opinion might well be the basis for some legislation by which disputes as to infringement of light might be referred to a skilled arbitrator, not to hear evidence, but to use his eyes and decide accordingly.

Enforcing the Provisions of the Building Act.

AN important point was decided in the case of The Attorney-General *v.* The Wimbledon House Estate Agency. On August 28, 1903, the defendants had submitted to the District Council certain plans of a house they proposed to erect, and work was commenced on the house on August 31. On September 8 the plans were returned to the defendants that certain amendments might be made in them to make them accord with the Council's by-laws, and on September 14 the required amendments were made. On September 23 the plans were disapproved, the alleged reason being that they were not in accordance with the by-laws, but the real reason—and this was explained to the defendants on September 28—was that a portion of the building, the billiard-room, was in advance of the main front wall of adjoining houses contrary to the provisions of the Public Health (Building in Streets) Act, 1888. By that date the walls had attained a considerable height, and on November 23 the Council took out a summons under section 3 of the above Act to recover penalties, and at a subsequent date penalties to the amount of 20*l.* were imposed. The present action was one at the instance of the Attorney-General for a mandatory injunction against the defendants. It was argued for the defendants that the only remedy was that conferred by the statute, which had been already enforced in the summary proceedings, and that, even if a second remedy was available, it could not be enforced against the same defendants after an election as to the remedy had been made. The Court negatived both these contentions and granted the injunction. It appears from the judgment that, the offence being a continuing one, the Council also could have gone on summoning the defendants as the penalties accrued due, even had the Attorney-General not proceeded in the matter.

Landlord and Tenant.

ON August 8 last we commented on the case of "Harman *v.* Ainslie," in which a point of everyday occurrence and of extreme importance to landlord and tenant was decided. This case has now been reversed on appeal, and is reported in the Law Reports for the current month. The lease under consideration contained the usual covenants to pay the rent, rates and taxes, and to repair, and a covenant not to assign, underlet, or part with the premises without the consent in writing of the landlord, which consent was not unreasonably to be withheld. There was also the usual proviso that if the lessee should commit any breach of the covenants "on his part to be performed," then the landlord should have the right to re-enter and the lease should be determined. The tenant committed a breach of the covenant not to sub-let, and Mr. Justice Wright decided that this did not give the landlord the right to re-enter since the word "performed" could have no application in the case of a negative covenant not to do a certain thing. The Court of Appeal have reversed this decision, giving to the word "performance" a wider and more businesslike construction as including not only the duty to do a certain thing, but also the duty to abstain from doing a thing, or, in other words, the duty to carry out an obligation undertaken. The decision is the more satisfactory since it sweeps away the technical distinction between leases which contain the word "observe" as well as "perform" in this connexion, and although it is remarkable that such a point should never have been absolutely decided before, seeing that this lease may almost be said to have been drawn in common form, it is satisfactory that it should now be settled on a business-like footing and without a regard to legal subtleties.

Earth Pressures.

THOSE of our readers who are professionally concerned with the study of lateral earth pressures and related phenomena will find some interesting reading in a paper read last month before the American Society of Civil Engineers by Mr. E. P. Goodrich. There are many theories relative to the action of granular masses, to lateral pressures, planes of action, and planes of friction, but the results given by the formulæ evolved are somewhat at variance with each other, and with the results shown by such experiments as have already been conducted. The author of the paper to which we refer describes a comprehensive series of experiments which throw some new light on the subject generally, and will probably serve as the nucleus around which practicable working rules may be built.

The Electrification of London Railways.

WHILE the public have some ground for complaining that the companies controlling the suburban systems of railways in London show very little evidence of a desire to secure the advantages to be derived from the use of electricity, this backwardness is a fault of the directors rather than of their professional advisers. Proof of this is afforded by the evidence given at a recent sitting of the Royal Commission on London Traffic. Mr. Dawson, the consulting engineer to the London, Brighton, and South Coast Railway, pointed out very clearly the benefits to be derived from the electrification of suburban lines, showing that in addition to increased average speed, decreased cost of operation, and increased receipts, the companies would secure other important advantages by the change. For instance, electric tramways, instead of taking away passengers, would then serve as feeders and distributors of railway traffic. Mr. Dawson gave a very significant warning to the effect that if the companies merely experimented with electricity by sandwiching a few electric trains between local steam trains nothing but failure could be expected, as all the advantages of electric traction would be entirely lost. At the same sitting Mr. Cotterell, the chief engineer of the Liverpool Overhead Railway, detailed the advantages already derived from the use of electric traction in Liverpool, where horse trams and omnibuses have been superseded, not only in the neighbourhood of the docks, but throughout the city generally. There is no doubt that in the present day the horse is an anachronism so far as large cities are concerned, and the electrical engineer will play a very important part in abolishing an obsolete and unsuitable system of traction.

Messrs. Broadwood's New Premises.

WE mentioned the other day the transformation of Limmer's Hotel into new show-rooms and offices for Messrs. Broadwood, with some notes on the history of the site. Messrs. Broadwood have had the new premises on view during this week and last week, the contents being arranged to illustrate the evolution of the pianoforte from early times, and to show successive changes in construction. In the upper rooms are to be seen specimens of the Clavichord, Spinet, and Harpsichord. One of the earliest square pianofortes, by Zumpe (1766), is to be seen, followed by the improved instruments in the same form made by Johannes Broadwood in 1774 and for some twenty years after. Thence we come to the grand pianoforte and to the modern upright and cabinet pianofortes. Several examples of artistically treated grand pianofortes are to be seen, two or three of which have been illustrated in our pages. Among the modern instruments for sale in the ordinary course of business one is glad to notice a tendency towards the employment of more simple and truly constructional form in the design of the case and supports, in place of the old inartistic and *rococo* kind of design which was formerly the only thing to be had from a pianoforte maker, except in pursuance of a special order on the part of the purchaser.

MAGAZINES AND REVIEWS.—We are obliged to postpone till next week our usual notice of "Magazines and Reviews."

ARCHITECTURE IN CAPE COLONY.—A meeting was held on the 8th ult. at the Rhodes' Building, at the invitation of Mr. F. Masey, F.R.I.B.A., of the members of the Royal Institute of British Architects resident in Cape Town, to consider the expediency of doing something to forward the cause of architectural education in the colony, more particularly with regard to Cape Town. On discussion, it was agreed that, as soon as prospects justified such action, an effort should be made to secure some systematic teaching of architecture in one or more of the representative colleges in the colony, and that in the meantime the matter could be best advanced by arranging for an Intermediate examination for the Institute to be held in Cape Town as soon as possible. Mr. H. Baker being at the present moment in London, it was arranged that he should be asked to approach the authorities as to the possibility of the proposal being carried into effect.

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THE ARCHITECTURAL ASSOCIATION.

AN ordinary general meeting of the Architectural Association, the last for session 1903-04, was held on Friday last week in the Meeting-room of the Royal Institute of British Architects, Mr. H. T. Hare, President, in the chair.

The minutes and nominations having been read and confirmed, the following gentlemen were elected as members, *i.e.*, Messrs. G. B. Clay, S. H. J. Murch, A. B. Scarlett, G. B. Cobbett, J. R. Musto, C. B. Cleveland, J. W. Keasley, and H. Kershaw.

New Premises Fund.

The Chairman announced the following further donations to the New Premises Fund, *i.e.*, Messrs. J. H. Christian, 10*l.* 10s.; Professor Henry Adams, 5*l.* 5s.; W. H. Jamieson, 5*l.*; J. H. Belfrage, 1*l.* 1s., and L. Simmons (second donation), 1*l.* 1s. The Chairman added that this was the last meeting of the session, and he desired to call attention to the fact that the Association still had a large deficit to meet, and he hoped that donations would continue to come in liberally. It would be some time before the Association was free from debt on the new premises, and he hoped that all members would bear that in mind.

The Chairman also announced that the Members' Dinner will be held at the Criterion Restaurant, Piccadilly-circus, on Friday, May 13.

Mr. Louis Ambler, Hon. Secretary, proposed a vote of thanks to Mr. Clyde Young for allowing a party of members to visit the new War Office buildings on April 23. This having been agreed to, Mr. Ambler announced the first summer visit—to Moor Park, Rickmansworth—on May 14.

Officers for Session 1904-1905.

The Chairman then read the Scrutineers' Report on the election of officers, and proposed a vote of thanks to Messrs. Denington, Paul, Simmons, and Yates for acting as scrutineers. There were 383 voting papers and fourteen were rejected. The following is the result of the voting:—As President, Mr. E. Guy Dawber; as Vice-Presidents, Messrs. A. T. Bolton and J. S. Gibson; as Committee, Messrs. Henry T. Hare, R. S. Balfour, W. A. Pite, Arnold Mitchell, John Murray, G. B. Carvill, Walter Cave, J. MacLaren Ross, A. Needham Wilson, and E. W. Wimperis; Hon. Treasurer, Mr. Francis Hooper; Hon. Librarian, Mr. W. A. S. Pettit; Hon. Secretaries, Messrs. Louis Ambler and H. Tanner, jun. Other officers:—Hon. Solicitor, Mr. W. H. Jamieson; Hon. Assistant Librarians, Messrs. E. Gunn and C. M. Crickmer.

Mr. A. Needham Wilson then proposed a vote of thanks to the School of Design visitors, the retiring President and Committeemen, and the Press. The Association owed a great debt of gratitude to the School of Design Visitors, he said, and their efforts on behalf of the students were particularly gratifying. The Association was also under a special debt of gratitude to the President and the retiring Committee, and he thought that those gentlemen must be glad to see the work of the Association brought up to the satisfactory stage of being housed in their new premises; and in that connexion he hoped that the debt, which would be a burden to future presidents, would soon be extinguished. As to the Press, the Association was very grateful to them for the admirable manner in which they reported the meetings.

Mr. Simmons seconded the motion, which was heartily agreed to.

The Chairman, in reply, expressed his thanks and the thanks of the retiring Committee for the vote of thanks. Attendance at the Committee meetings involved a sacrifice of time, but they were all glad to do what they could to further the interests of the Association in every way. It was a labour of love to all of them.

The Value of Science in an Architectural Curriculum.

Mr. A. E. Munby then read the following paper:—

My excuse for introducing a paper upon the subject before you this evening must be that we live in an age of upheavals. Education, as all who take the most superficial interest in it must know, has recently undergone extraordinary changes. In every branch of teaching we see these changes; the stereotyped methods of learning modern languages have gone by the board, the time-honoured system of instilling mathematics has been shaken to its foundations by the power of the new school of exponents, history and geography are taught upon a rational plan and no longer as an isolated collection of facts, and the claims of science for a place in a liberal education, which ten years ago were ignored by many, are to-day absolutely undisputed. No professional course of training can remain unaffected by these changes in the work which precedes it, perhaps architecture, with its enormous range of subjects, less than any.

Even in the practical training of craftsmen the forward movement is apparent. The strenuous struggle for existence has killed the old-fashioned apprentice, the trades are no longer taught by kicks and rule of thumb, but with some regard to the principles on which they are based. Those of us who have seen anything of the life of London's fifty polytechnic and allied institutions, or of similar institutions in the provinces, to which thousands of men come willingly, often after a hard day's work, those who have seen how advanced much of such work is and who have noted the zeal and ability of the teachers, must be profoundly impressed with the effect which such advances will shortly have upon the professions. In the youngest of these schools, opened by the London County Council at Brixton two months ago, to be devoted entirely to the building trades, it is even proposed eventually to equip the workshops with a complete set of instruments and plant for tests on materials.

It would, however, be unfair to imply that the professions as a whole are indifferent to these advances. Years ago the medical profession discarded the old system of apprenticeship, organised its educational forces, and gave its members a protected status, with the result that the present system of teaching is far in advance of that of most other professions; hence the wonderful advances in medicine and surgery which we have seen within recent years, and our advances in pure science, which form the foundation of the advances in its applications, may be traced to a like cause.

Education for the Navy has long been systematised, and has recently received a fresh impetus at Osborne. The Army is reorganising its educational methods; engineers have their splendidly-equipped schools. The legal profession has recently been adding to its educational facilities, and with such success in the north of England that London is following suit, while educationalists themselves now realise that they must be taught to educate. What, then, of architecture? That its educational facilities are not considered wholly satisfactory seems to be proved by the existence of the Institute Committee upon Architectural Education, and we cannot but await with great interest the results of its deliberations.

It is precisely because this matter is *sub judice* that I venture to put before you this evening the plea that science should receive more consideration as suitable food for the architectural student, and allow me to add at once that this suggestion is not in the least at variance with the view that architecture is an art. There is, I believe, a section of the profession which looks upon science with a suspicious coldness, as being destructive of art, as slaying poetic visions with unromantic facts, and as necessarily supplanting a free and living curve with a parabola or an hyperbola. I venture to think that such a view is an unjust one. "Every work of art," says Ruskin, "either states a true thing or adorns a serviceable one," and science gives us both truth and service. If Nature herself is the highest art, he who would reproduce her must study natural laws. A painter from life profits by a knowledge of anatomy, similarly an architect will be more in harmony with his environment if he is conversant with the composition, physical properties, and past history of his materials. The materials would then be always selected suitably to the design, and thus science would become the handmaid and not the supplanter of art.

But however this aspect of science may be viewed, there are many direct applications of science to architecture as understood at the present day. Architects are no longer called upon to produce massive and utterly uncomfortable buildings, such as those of Vanbrugh's time. The modern building is full of complications, which, with the advances of science and extended demands for comfort, will increase, and when the contractor has ceased to be a builder will become more than ever the responsibility of the architect. The arrangements for drainage and water supply, ventilation, warming, and lighting, the selection of suitable materials and the display of judgment in dealing with the thousand and one patents brought forward by the building trades, the power of probing the worth of statements in favour of any materials by deciding upon, and being able to subsequently understand, the various chemical and physical tests to be applied to them, provide indeed a wide field, which, if inartistic, is admittedly within the province of the architect, is by no means devoid of interest or skilled work, and certainly requires the direct application of science.

Let us consider the effect of a *laissez faire* attitude upon these matters. A vast army of industrial workers, becoming every year better equipped in the principles of their trades, is producing novelties which are, broadly speaking, improvements in methods of construction, sanitation, and kindred branches of industry which depend upon the building trades for support. These new productions are, of course, put forward with the object of material gain to the makers, but at the same time they are the results of that spirit of emulation and progress which are the characteristics of active life, and are the outcome of the thought of specialists in individual lines. To the architect is offered the crowning position with regard to such industries; he is the court of appeal as to the success or failure of such advances. If he assumes an attitude of indifference must we wonder, and ought we to complain, that the tide, stemmed by his apathy, finds new outlets, and that the public place in other hands matters which should pass through his hands alone? It is true that the span of life does not increase with the increased burdens which the profession is called upon to bear. The suggestion that the individual should attempt to give judgment on the new products of every trade would be, of course, impracticable. This difficulty need not plunge us wholesale into specialisation, which, if carried too far, would lead to the destruction of the profession as such. It could largely be met by centralisation. The matter was touched upon in a paper read last year before the Association, and the establishment of a General Information Bureau in touch with the trades, for the collection of statistics, standardisation, and testing, would go far towards solving what must some day become a pressing question. This is so large a problem that I should be led away from my subject in pursuing it; but it is one which, should the collection of data lead to any practical suggestions, might be worthily discussed. In the meantime it is most gratifying to learn that the Institute is in communication with the director of the National Physical Laboratory with a view to arranging facilities for conducting tests on materials.

It is, of course, easy to generalise on such a topic as this, but to make such generalisations of any value it is essential that they should be supplemented by definite proposals as to courses in science and their bearing in detail upon architecture. Before going into these details, it may be of interest to see how far such work is found to be practicable and desirable in various teaching centres at the present time. For this purpose I have made inquiries from a number of institutions in this country and abroad, selecting as far as possible those of university rank. The results of this investigation are contained upon the diagram before you, and I should like to take the opportunity of thanking the professors and lecturers who have so kindly answered my inquiries, in some cases at considerable personal trouble. I am also indebted to the valuable papers of the late Mr. Cates and to the librarian of the Institute for his kindly advice upon several occasions. The centres were selected more or less at random, without any consideration for their predilections for science or the reverse, and the table would have been more complete had not my attempts to obtain details unfortunately proved abortive in more than one instance. The courses dealt with are ordinary architectural, and not engineering, courses, and the diagram shows the hours per week in the various years devoted to physics, chemistry, and geology, under which last heading I have included in one or two instances other branches of science, such as botany. It has not been an easy matter to bring the data collected into line, and I cannot guarantee the figures as absolutely accurate, but I believe they are sufficiently so to show the regard in which science is held at these institutions. While our courses in this country extend over not more than three years, those in America and Germany

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extend usually over four years, and the total average given in the last column but one is taken on the four years basis for all. Both lecture-room and laboratory work (of which there is a fair proportion) in both pure and applied science are included in the hours given, but no allowance is made for the students' private reading. Under physics I have included such applications as courses on structure stresses, hygiene, and materials, but not courses on ordinary construction or on mathematics.

HOURS PER WEEK DEVOTED TO SCIENCE IN ARCHITECTURAL COURSES.

Years	Physics. 1	2	3	4	Chemistry. 1	2	3	4	Geology. 1	2	3	4	Total Average.	Possible % of Science Entrance Exam.
McGill	5	5	7	5	—	6	—	—	—	—	—	3½	7·9	20
University College	4	13	3	—	7	—	—	—	—	—	—	—	6·8	40
Glasgow Tech.	9	3	—	—	—	—	—	—	—	—	—	—	5·3	0
Bristol	4	6	2	—	4	—	—	—	—	—	—	—	4·0	—
King's College	5	1	½	—	6	—	—	—	—	—	—	—	3·1	—
Manchester	3	1	2	—	—	—	—	—	—	—	—	—	1·5	17
Liverpool	2½	3½	—	—	—	—	—	—	—	—	—	—	1·5	20
Illinois	—	12	3	2½	—	—	—	—	—	—	—	—	4·9	55
Massachusetts	—	5	3	4	—	2	—	—	—	—	—	—	3·5	—
Pennsylvania	3	2	4	—	—	—	—	—	—	—	—	—	3·3	—
Harvard	4	2	3	2	—	—	—	—	—	—	1	—	2·8	—
Columbia	1½	2	2	2	—	—	—	—	—	—	—	—	1·9	25
Dresden	2	5½	2	2½	3	—	—	—	—	3	—	—	4·5	—
Stuttgart	6½	—	1	3½	—	—	—	—	3½	1½	—	—	4·0	13
Charlottenburg	2	1½	2	2½	2	—	—	—	—	½	—	—	2·5	—
École Spéciale	1	2	—	—	1	1	—	—	1	—	—	—	1·5	—

If we assume that the teaching hours for a student average twenty-six per week, and that his course of training extends in all cases over four years, then the statistics before you will give the following as percentages of his total academic career devoted to science and its applications:—McGill University, 30½; University College, London, 26; Glasgow Technical College, 20½; University of Illinois, 19; Dresden Technischen Hochschule, 17; Bristol Merchant Venturers College, 15½; Stuttgart Technischen Hochschule, 15½; Massachusetts Technical Institute, 13½; University of Pennsylvania, 12½; King's College, London, 12; Harvard University, 10½; Technischen Hochschule, Charlottenburg, 9½; Columbia University, 7; École Speciale d'Architectur, 6; Manchester School of Technology, 6; Liverpool University, 6. The omission of the courses of our Association from the above list is due to the different system adopted which makes a fair comparison impossible; the amount of time devoted to science will, however, be admitted as small.

Applications of Science to Architecture.

As showing the value of a training in the principles of science, I will now ask you to allow me to touch in detail upon some of the applications of science to architecture, and at the same time to forgive the necessarily disjointed character of what must be a rapid survey of a very large field.

Physics.—Physics deals with matter and energy, and, therefore, in its widest sense includes chemistry. In its generally accepted sense, however, it is taken to include dynamics (often called mechanics), acoustics, optics, heat, magnetism, and electricity, and we may shortly refer to its branches in this order. The application of the dynamics of solids to constructional work is too obvious to need any discussion, and forms a recognised part of all architectural courses. Lectures on this subject should always be experimental and supplemented by work in a mechanical and testing laboratory, which is the case in most institutions. The value of such a course may extend beyond mere construction—for example, a knowledge of the u e of a delicate balance and the appreciation of specific gravity might save a surveyor much time in the measurement of valuable and irregular sites. The dynamics of liquids and gases, on the other hand, generally receives but scant treatment. An architect has constantly to deal with problems involving water supply and the flow of water and drainage in pipes, he must not suggest a lift pump for a 35 ft. well, nor a water turbine without considering his loss of "head" by friction, and he must have an hydraulic ram up his sleeve for country houses blessed with a stream in their grounds. He cannot tackle these problems unless he has an elementary knowledge of the principles of hydrostatics and kinetics. Again, the dynamics of gases brings us to the important subject of ventilation. A knowledge of the relation between the pressure and volume of air, the relative weights of different gases and their expansion with rise of temperature (properly studied under heat) would render many ventilating problems intelligible and interesting, and sometimes point a way to the introduction of ventilation schemes at but little cost. Mechanical fans, now so much used, require more discretion in selection than they generally get, while the ducts and their bends for the passage of air require thought in planning to ensure success. The difficulty which sometimes arises in understanding why the heavy gas, carbon dioxide, produced by combustion and breathing, vitiates the air at the top of a room can be cleared up by two very simple experiments, which you will perhaps allow me to make as an indication of the way in which such a course may be illustrated.

Acoustics is of all the branches of physics the most difficult in its practical application, and probably a deep study of the subject would be of but little value to the architectural student. A knowledge of the velocity of sound in air and the conditions (chiefly depending upon temperature) under which this varies will however result in some notion as to the probable interference by reflection with the voice of a speaker, a consideration too often overlooked in public buildings; and in these days when we are herded together in flats and attached houses the conductivity of different materials for sound has become a highly important matter. Unfortunately, much research remains to be done upon the application of the laws of sound, but as experiments must be carried out on a large scale to be of value, they are naturally difficult and costly.

A knowledge of the laws of heat finds many applications in architecture. The amount of expansion of materials with rise of temperature is by no means always appreciated. The Forth Bridge, for example, is just about one yard longer in summer than it is in winter, owing to expansion, and though architects are not usually called upon to deal with such spans as this, the growing use of long steel joists renders the fixing of such joists often worthy of care. The great coefficient of expansion of lead, nearly three times that of steel, accounts in part for its "crawling" propensities. Joints of materials which expand unequally are never likely to remain sound. For this reason steel and concrete will make a much more permanent joint than steel and brickwork in mortar or cement. In this connection the mass, specific heat and conductivity of the materials must also be considered. Anyone can convince himself of the expansion of solids by making the simple experiment before you.

Upon the expansion of liquids depends the whole system of water circulation, and here I would venture to point out the hardship imposed upon good firms in tendering for hot water plant when the architect does no more than state the temperature to be exacted in the building to be heated, as it is then easy for an unscrupulous firm to give a low tender by subsequently supplying a boiler and furnace which will only give the required result by being worked in a detrimental manner with a forced draught, an easy thing to arrange if the system is ever tested. A rudimentary knowledge of the principles of heat would enable the architect to include in his specification, with but little trouble, sufficient detail to safeguard both client and contractor. A knowledge of the specific heat of materials and their conductivity is useful in problems of warming and fire risks. Again, the melting points of substances are often an indication of their purity. Good mastic, for example, melts at about 260 Fahr., but if it is adulterated with coal tar pitch it liquefies at a much lower temperature. Such an investigation could be made in a few minutes with the aid of a test tube and a thermometer.

Perhaps the study of optics has less bearing upon an architect's work than other branches of physics, but a knowledge of the laws of illumination would help him to arrange his lights, and the principles of dispersion are of value for the understanding of colour problems. The comparison of the power of different lights is sometimes useful, and for approximate purposes can generally be ascertained after a moment's calculation with the aid of no more apparatus than a foot rule and a stick.

Turning to magnetism and electricity, every architect carries a compass, and a little knowledge of terrestrial magnetism will prevent him from overlooking the difference between the magnetic and astronomical north when setting out his buildings. Electricity, although it has few indirect applications to architecture, is itself of such direct importance that no apology is needed for putting forward its claims in this paper. It is not possible for an architect intelligently to supervise the electric lighting and power arrangements in a building without some knowledge of the principles of this science. It may be said that he is safeguarded by fire insurance regulations, but he does not always see that these regulations are complied with, and the insurance companies must take much of the work on faith. To an unobservant eye all wiring work appears much the same, and although it is on the whole exceedingly good considering the immunity with which it is usually carried out, yet when prices are obtained in competition the contractor would be more than human did he never profit by this independence. Although I am far from wishing to impute this as a general thing, I know at least one firm with a very high reputation which makes a practice of giving its foreman a commission upon what can be saved in carrying out wiring contracts, which appears to me to be a direct incentive to a bad class of work. The trade in electrical sundries is now an enormous one, and some firms abroad who send goods to this country have regular grades of fittings showing a carefully-arranged deterioration from the first samples submitted, with the result that there is always a great deal of rubbish on the market, and foreign countries are careful to arrange that such goods do not return by imposing a heavy import duty. I have here a few specimens of good and bad switches, etc., kindly collected for me by the General Electric Company, of Queen Victoria-street, E.C. How instructive would a museum arranged on these lines for all the trades prove to the student!

Chemistry.—Though chemistry has less bearing upon architecture than has physics, the general principles of the science are essential to anyone who would really understand materials. It is often supposed that chemistry is confined to problems of analysis, and I believe people still exist who would dispose of chemists as men who serve in shops and men who analyse minerals and foods. The attitude of this country towards science has not made it possible for the public to realise that the most valuable work in any of its branches is not the mechanical repetition of known processes, but the broadening of the foundations by research, which alone can supply the nursery for useful applications. Chemistry enables us to tell beforehand the changes which are likely to take place in bodies in varying circumstances, and therefore to employ materials suitable to their environment and to know how to set about remedying defects which have arisen through neglect of such precautions.

In the selection of a building stone a knowledge of its composition and physical structure is of great value. The weathering of stone owing to its absorption of water from the atmosphere and the subsequent freezing of this water depends, as is well known, largely upon its porosity and power of cohesion. Water expands by nearly one-twelfth of its bulk on freezing, and though it may be confined, it will still freeze and force the particles of the stone out of place to find room for expansion. A substance would require a cohesive force of about 10,000 lb. per square inch to prevent confined water within it freezing when subjected to only ten degrees of frost F°.

To illustrate this point I am freezing some water inclosed in a steel bottle, which I hope to show you has been burst in the process.

This expansion of water is, of course, a purely physical action, but the power of ordinary water in producing chemical changes is no less

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important. It has been said that no one has ever yet seen pure water; ordinarily it may be considered as a weak solution of carbonic acid, and has considerable solvent action upon many stones consisting of carbonate of lime—even marble is not proof against its attacks. A case is cited of a marble monument in Gray Friars churchyard which decayed to a depth of a quarter of an inch in sixteen years through the action of the atmosphere and water, but this is, of course, a very extreme instance. That carbonate of lime is soluble in water containing carbonic acid gas can easily be demonstrated.

Iron pyrites, which is almost always present in coal, produces on combustion a gas which in our moist atmosphere is rapidly converted into sulphuric acid. Coal contains about 1 per cent. of sulphur, which on combustion produces eventually some 67 lb. of sulphuric acid per ton of coal. Probably quite 16 million tons of coal are annually burnt in Greater London, and if the whole of the sulphuric acid produced descends upon us in rain and fog, we are annually refreshed, therefore, with some 500,000 tons of this corrosive liquid. Not only does this acid attack stone more violently than does carbonic acid, but it forms compounds in the stone which occupy more space than the original particles, so that the effects are much like those produced by frost. Silica, of which many sandstones are almost entirely composed, is, on the other hand, entirely unacted upon by any atmospheric acids, and therefore a closely-grained sandstone is usually very durable. Rather curiously, an instance has been cited of a defaced monument of sandstone in the same churchyard of Gray Friars on which the marks of a chisel are visible after more than 200 years. A repetition of the last experiment, substituting silica for carbonate of lime, will demonstrate this difference in solubility.

The action of water upon lead on account of the poisonous nature of lead compounds should be considered in arranging a soft water service. In the presence of nitrates, often found in potable waters, the action of the water upon lead is quite considerable even after a short period. Finally, as regards water, a water analysis is a first essential in the selection of a country site, and the architect should be able to understand the analyst's report and to advise his client thereon.

As regards other materials used in building, in slates are found two forms of iron sulphide, one of which disintegrates on exposure, while the other is permanent, and therefore harmless. The presence of free lime—that is, calcium oxide—in bricks, which is sure to cause disintegration, is very easily detected chemically, and where facing bricks are used in important work I would go as far as to suggest that the brickmaker should furnish an analysis of the coal used for firing with a view to guarding against that distressing malady, so difficult to cure, efflorescence in brickwork.

The important subject of limes, mortars, and cements cannot be understood without a knowledge of chemistry. If analyses of these materials were more generally demanded by architects we should hear much less of bad and bulging plaster, friable mortar, and the upheaval of cement floors. The strength of cementing materials should be apportioned to that of the bricks. It is mere waste of money, for example, to build in cement some of the miserable slack-baked London stocks which too often find their way into good-class buildings. Anything under the name of Portland cement generally passes unchallenged, and although adulteration is fortunately rare in this country, ragstone is sometimes added, but can easily be detected under the microscope. Blue lias lime and Portland cement often exhaust an architect's category as regards cementing materials, whereas selenitic mortars, which allow a large proportion of sand, might often be used with economy. Selenitic limes are used chiefly for plasters, but in dry situations deserve an extended use for mortars. Tests made in France indicate that the strength of Portland cement is increased by making it selenitic, *i.e.*, by the addition of sulphate of lime, but the careful tests of the British Committee on Cements do not confirm this view. The addition of sulphate of lime, however, to ordinary limes appears to produce a considerable increase in strength. Mr. Redgrave cites tests which show that selenitic mortar has about five times the strength under compression that similar non-selenitic mortar possesses, and the tests recorded by the same writer, carried on during the building of the Law Courts, indicate that between brickwork Messrs. Nelson's selenitised lias lime used 1 to 5 was more than twice as strong as ordinary lias lime 1 to 3. If these tests can be relied upon, a remarkable financial saving should be effected by following the precedent set by Mr. Street. The lime and sand for a rod of brickwork in ordinary blue lias 1 to 3 is worth about 40s. and in selenitic lias 1 to 5, about 30s., but if this latter is really twice as strong as the former it is not merely one quarter, but more than two and a half times cheaper. Were cementing materials sold by strength and not by weight, such points as these would receive more general attention. The breaking strain of a briquette of cement without a knowledge of its chemical composition is often of little value. A cement, for example, containing an excess of lime will come out of test with flying colours, but it is most dangerous to use as it is liable to disintegrate, when, of course, its cementing power is practically nil. Again, if a cement contains much iron, sodium, or potassium, it is almost certainly underburnt, as in this case it could not have been raised to the proper temperature without partially fusing in the process. Messrs. Nelson and Company, of Rugby, have been good enough to prepare a number of briquettes of varying composition. The testing machine before you is made and kindly lent by Messrs. Faija, of Old Queen-street, Westminster.

The preservation of the metals used in building is often largely dependent upon the substances with which they are in contact. A very small knowledge of electricity and chemistry would point out the extravagance of using any but the purest zinc in a moist atmosphere, and the rapid corrosion which must take place when this metal is left in contact with carbon (as soot or coke, for example), or with copper, iron, or lead. The electro-negative character of zinc again renders it open to be acted upon by lime, and therefore to decay in contact with mortar or cement. The oxidation of iron, for similar electrical reasons, takes place in a moist atmosphere with increasing rapidity after the formation of the first film of oxide. The quality of iron, as, for example, the difference between grey and white cast iron, would be appreciated by a very brief study of the metallurgy of iron and steel.

Turning to timber, the important subject of the impregnation of wood, either for its preservation from decay or against fire, is largely a chemical question, while the compounds contained in wood, such as gallic acid in oak, forming as it does an ink in contact with iron, have often to be taken into account.

The trade of the painter yields a profitable field for chemical inquiry. Though we specify white lead, prepared by the old Dutch process and well matured, we are not in the habit of seeing that we get it. Second quality paints are manufactured on quite a large scale and sold as such; they contain as a substitute for the greater part of the white lead, barytes, chalk, or sometimes other bodies, and these are quite inferior in covering and binding power. Barytes, being a heavy mineral, is the most suitable adulterant from the point of view of the vendor. Such paints are easily distinguished by merely treating them with nitric acid if in powder, or if, as would more usually be the case, mixed in oil, without the aid of anything further than a wooden match, a piece of washing soda, and a sixpence, as we will show. Further, if such inferior paints are carefully weighed, then heated and weighed again, they will be found to lose much less in weight than would a good lead paint, which contains a considerable proportion of combined water capable of removal on heating. If paints with a white lead base are used in a sulphurous atmosphere, such as that of a chemical laboratory, or where bad coal gas is much burnt, they rapidly blacken owing to the formation of sulphide of lead. In such cases zinc white should replace white lead, and for light greens or yellows real chrome green and cadmium yellow. As these paints are more expensive, and have to be employed in larger quantity for the same covering effect, they are often adulterated with white lead. This again may be detected with the aid of a mouth blowpipe and a piece of charcoal in two or three minutes without resorting to a professional analyst. Similarly the value of black paint, which should always have a base of white lead if it is to protect the material covered, may be ascertained. In case a blowpipe and charcoal seem to be outside the range of architectural routine, perhaps I may be allowed to repeat the experiment substituting for them paper and pencil.

I am indebted to the Architectural Association and to Messrs. George and Company, of Hatton Wall, E.C., for the loan of the apparatus used in these experiments.

I will not try your patience by entering further into the applications to architecture of these three sciences which I have selected for illustration, but in referring to geology will content myself by pointing out its great value as indicating the localities and sometimes the probable quantities of various building stones and their planes of stratification or bedding. Not less valuable is some knowledge of this science when the choice of a site, both from the point of view of health and the stability of the building, is in question. In the matter of well-sinking much needless expense has been often saved, and superstitious practices averted, by a little knowledge of the strata of the neighbourhood.

With a view to obtaining some idea of the amount of existing scientific literature useful to architects, I have during the last few months visited the libraries of the British, South Kensington, and Jermyn-street Museums, also those of the Chemical and the Geological Society and the Patent Office, besides that in which we are here privileged to meet, and certainly that of the Patent Office should be placed first, taking the size of the collection, its accessibility, and excellent arrangement into account. While text-books on pure science leading up to its applications in architectural work seem to be non-existent, works on the applications themselves are, of course, very numerous, particularly as far as physics is concerned. Chemistry, although touched upon incidentally in many books, is exceedingly scarce in the field we are discussing, and I have only found in these seven libraries six small books dealing with the chemistry of building materials. Of these the most important and suggestive are reprints of the courses of lectures given on this subject at the School of Military Engineering, Chatham, copies of which are not easy to obtain. While no general handbook on geology written for the architect seems to exist, several useful works on building stones may be consulted, and perhaps special mention should be made of the little Survey publication on sites in London, with its geological map, which can be purchased at the Jermyn-street Museum.

On the supposition that some knowledge of science is desirable for an architect, let us turn, in conclusion, to the practical means for attaining this knowledge. Many valuable courses dealing with the applications of science in the manner I have endeavoured to indicate already exist, though in some cases they are very curtailed; but the chief point which I wish to make in this paper is this—*that unless some previous knowledge of the principles of science is insisted upon, such courses cannot be properly appreciated, and the time spent upon them must be largely thrown away.*

I would venture to suggest that a passage through the following courses should form part of the requirements of an architectural student on the outset of his career:—

(1) A general experimental course on physics, including laboratory work and dealing with the dynamics of solids and fluids, with heat, magnetism, and electricity, and very briefly with acoustics and optics.

(2) A similar course dealing with the elements of inorganic chemistry, touching upon principles, but chiefly of a descriptive character. Mere analysis to be subordinated to simple quantitative work and the preparation of important compounds. The illustrations of chemical laws being based as far as possible upon those substances which would afterwards figure in a course of applied chemistry.

(3) A short course outlining the principles of geology, and dealing with the stratigraphical arrangement of rocks and with petrology, rather than with palæontology, and aided by the examination of museum specimens, such as the collection of building stones in the Jermyn-street Museum and by occasional visits to quarries.

The whole of the above work, in the simple form in which I have it in view, might be undertaken by a person of average intelligence at the age of, say, sixteen, and completed in one year with some twelve hours' teaching per week. This means the devotion of about half a year to pure science, and when a student starts his career early, and has no prospect of practising at the end of three or four years, which is generally the case, such time spent on science

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ought by no means to be grudged. In the case of older students such knowledge might well be demanded of them upon entrance to their studies, since the facilities for teaching science at our public schools could at the present time easily meet such requirements.

I am sure that the help and encouragement to those engaged in lecturing to more advanced students upon the applications of science would be enormous were such preliminary courses insisted upon, and we might hope that these courses upon applied science would themselves grow under these more favourable conditions, but were this impossible, at least much more could be done in the time at disposal.

It would ill become me as a return for your invitation to read this paper, and as such a newcomer into the ranks of this Association, to criticise its educational work. Yet may I be allowed to put the question whether science is sufficiently considered in our curriculum? The Association, with its large roll of eminent members so strikingly in touch with the educational well-being of the profession, occupies a commanding position, and under the new conditions just entered upon cannot fail to attract the attention of all other teaching centres. Do our facilities for teaching the science of architecture compare favourably with those of other institutions? Is it a sign of progress that a course once held upon the chemistry of materials has, for more than ten years, ceased to exist, and that we have nothing in the nature of a laboratory? I am aware that the courses given must be largely governed by the Institute examinations. May we hope that, as the result of the deliberations of the Institute Committee on Architectural Education, science may figure more largely in the preliminary if not in the subsequent examinations? A glance at the requirements of foreign universities show how much more encouragement is given to science than is to be found here. Cornell, for example, recommends chemistry, physics, geology, and a modern language as the subjects for the entrance examination to its architectural courses, and in the final examination for the French diploma the candidate must pass an oral test in applied chemistry, physics, and geology. Lastly, considering the large and varied field in which an architect is called upon to work, would it not be possible to allow a student, within properly restricted limits, to develop along lines best suited to his abilities by the introduction of one or two alternative subjects into his later examinations?

[Several interesting experiments were successfully carried out by the lecturer during the evening.]

In the discussion which followed, Mr. H. Stannus, in proposing a vote of thanks, said they were much indebted to Mr. Munby for his experiments and for the trouble he had taken in preparing his paper. He agreed with the point of view Mr. Munby had been making all through the paper, and he took it that Mr. Munby desired them not so much to criticise or to approve of his experiments *qua* experiments, but rather to consider the place of science in an architectural curriculum. All of them would agree that the more science—the more knowledge—they could have the better, but there was a danger of laying too much stress on or of trusting too much to science. It had become a byword that when science came in at the door art flew out of the window, but he would not go so far as that himself. But he would say this: science was a good servant to an architect, but a very bad master; or, as Mr. Munby put it, it was a good handmaid, but a poor master. What architects needed was a scientific method of dealing with the subjects taught in an architectural curriculum, the student being taught that there was an underlying science in the matters he learnt. Mr. Munby had pleaded for a great deal of science, and he (the speaker) agreed with him; but after all, the teaching of science in an architectural curriculum must bear some proportion to the other subjects. No education in architecture could be looked upon as final; the best that could be done was to enable a student to educate himself, for it was when a man began to face the actual problems that his education might be said to begin. Mr. Munby spoke of one year for the teaching of science. Would it not be better not to give too much science at once, and to spread it over, say, three years? If a young architect was set to learn a lot of science before he began his architectural course, he did not take the interest in it, or see the value of it, and, therefore, it would not be so beneficial to him as if he took the course of science at the same time as he went through his particular subjects. Tastes varied, and a man would assimilate that for which he had a taste, and, that being so, there would always be different kinds of architects.

Mr. H. D. Searles-Wood, in seconding the vote of thanks, said he thought that the whole point of the paper was as to the value of science as a mental training for an architect. The student should acquire his knowledge of pure science before he entered on his architectural training. All must agree that architects could have only a very elementary acquaintance with the sciences, and, while it was interesting to see Mr. Munby perform his experiments with such facility, they all knew that the great majority of architects would, if in performing the necessary experiments they went a little bit off the line, be absolutely at sea. If architects had sufficient knowledge to know their own limitations, and if they had enough elementary knowledge to enable them to follow a paper like Mr. Munby's, it would be well. The correct title of the little Survey publication referred to by Mr. Munby was "Soils and Sub-soils in Regard to London," by Dr. Woodward, and it was a most valuable paper. He thought it would be a good thing if the Secretaries of the Association wrote to the Geological Society and asked them for a list of the valuable papers on petrology which had been contributed to their journal. At the Jermyn-street Museum, not only had they a very valuable collection of building stones, but they also had valuable papers on matters connected with the building trades—memoirs on brick-earths, etc. He thought that the Association might write to the Museum authorities and state what the needs of the Association students were, and he felt sure that the Museum would be happy to supply lists of papers on subjects of interest and importance to students. He did not think it would be worth while for a geologist to write a book on geology for the architect. There was a book on engineering geology by W. H. Penning which was equally useful for architects, and the Americans had some useful books on the subject. As to a little knowledge being a dangerous thing, a geological map was sometimes made use of, but if an architect trusted to that he might easily go astray. A little more knowledge, however, as to the sub-soil would be of great interest and value.

Mr. A. Maryon Watson, B.A., in supporting the vote of thanks, said that Mr. Munby had moderately stated the claims of science to a place in an architectural curriculum, and everyone was agreed that what was wanted was scientific method. If we could learn to observe accurately, and to make correct deductions from our observations, that would be an important advantage. It would be sufficient for the architect if he were able to appreciate and explain the analysis of the purely scientific man—the chemist or the physicist, for instance. Mr. Aston Webb had lately reminded them that it would be the ideal for architects to try to know something of everything and everything of something, and that was a sufficiently high ideal to put before one. There was a great danger of architects undertaking to hold themselves out as specially scientific men. The responsibility was already sufficiently great when an architect gave his final certificate and certified that the client had got what he paid for, but if an architect had to go about with a test tube, etc., and test scientifically all the materials, he would not only have to test the first samples, but all the consignments of the goods. There was the good switch, for instance, and less good switches, and they would all have to be tested. Again, if one carried out a scientific test with the first bushel of Portland cement, one could not conscientiously certify at the end of the work unless every bushel had been tested. It was important to have a good method of reasoning about these things, and to draw a clear line between what was the architect's province and what was the province of the specialist. If a client wanted a chemical analysis of the materials in his building, the right thing for the architect to do would be to say that he could not do that himself, and that the client must go to an analyst. Mr. Munby seemed to suggest that an architect should advise as to the analysis of the water on an estate, but it was just there, surely, that the architect should retire and recommend the client to consult his medical adviser. He agreed with the greater part of Mr. Munby's paper, but he could not go quite as far as the lecturer.

Mr. F. R. Farrow also supported the vote of thanks. Mr. Munby had admirably shown one great advantage of scientific training and knowledge to the architect—one aspect of the value of scientific knowledge to the architect; but there was another view which appealed to him (the speaker) quite as strongly. Mr. Munby had emphasised particularly the value of science in helping an architect in matters connected with building, but he (the speaker) was inclined to view as of equal, if not greater, importance the value of science as a mental training for an architect. Mr. Munby had suggested that perhaps science and art were not on the most friendly terms, but he (the speaker) was inclined to think that scientific training was one of the best means of enabling the architectural student with artistic ability to make such a position in the world as would enable him to exercise his artistic ability to the greatest advantage to himself and his art. The architect-members of the Royal Academy were not only artists, but they were also first-rate men of business, and science was one of the best means of training a man in those qualities which go to make a good man of business. From this point of view he thought it would be a good thing to include pure science in the Association curriculum. There was a great deal for an architect to learn, but a place ought to be found in the curriculum for pure science, if only on account of the mental training he had referred to. Besides, architects would find it useful in their everyday work to have scientific knowledge of materials, in order to understand the value, etc., of the analysis of materials brought to their notice by merchants and others. There was great pleasure, also, to be derived from the study of science. Most of those who had had an architectural training either possessed or imbibed a certain amount of imagination, and that quality, when allied to science, enabled one to make discoveries which were not to be found in the text-books. In experimenting with lime in the Association classrooms he had made some discoveries which were not to be found in the text-books. In short, science was valuable to an architect as an equipment in his business, and it was valuable to an architectural student as a mental training in those qualities which would enable him to give his art full scope—which meant, of course, getting work. It was little use being a man of high artistic ability unless one could use that ability to the advantage of oneself and the world.

Mr. Max Clarke said that Mr. Munby suggested that science should have a greater proportion of time in the curriculum of the Association. At the lectures he (the speaker) had given from time to time the students seemed to complain that their time was already too much occupied, and if more time were given to science that would have to be deducted from other studies. He had come to the conclusion, based on what he had heard students say, that to carry out architectural education properly young people should not go into architects' offices to commence with. Students complained that the time given to office work left no opportunity for work in the curriculum of the Association. As to science in connexion with architecture, he took it that a certain amount of science was absolutely necessary. Where the scientific instruction in the curriculum of the Association should stop was a matter for the Association. In the lectures on hygiene he was allowed, as lecturer, twelve hours per annum to explain all about lighting, heating, ventilation, and kindred matters, and he found that the task was such an impossible one that he did not intend to attempt it in the future. No doubt Mr. Munby was correct in his main point—a man ought to have a certain amount of scientific knowledge, and he ought to get it while young, and not when he was entering into his third or fourth year of study. That was not the time to begin to learn about acoustics, light and heat, etc., on which so many students were absolutely ignorant. Students should learn these things either before they commenced architectural study at all, or else they should take those subjects at the commencement of the curriculum.

The Chairman, in putting the vote of thanks, said the paper was a unique one in its way, and he did not remember having heard one in that room touching on the same ground as Mr. Munby had done. They must all agree with Mr. Munby that a certain amount of

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scientific education was very desirable, and almost necessary now, in the curriculum of education for an architect, but what was really necessary first was that the grounding of this scientific education should be given at school before a boy thought of becoming an architect or anything else. One of the complaints of all the teachers of the Association was that the majority of young fellows who went into the classes were imperfectly educated, and were not in a position to take advantage of the teaching. He hoped and believed that that would become less and less the case; the care for the education at the schools was becoming more systematised, and a great deal more attention was being given to secondary education than up to now had been the case. He believed that students who entered the Day school now were better equipped than some of those the Association had had in the evening school, for instance. One remark Mr. Munby made which seemed to have a great deal in it was as to the samples, and he said it might be a good thing if the Association had samples in order that the students could judge of the relative merits of things. It seemed to him (the speaker) that it would be useful to have a sort of museum of good and bad materials and manufactures, which need not be extensive, and which would illustrate good and bad qualities of goods. That would be of use to students and others, and might be worth doing.

The vote of thanks having been heartily agreed to,

Mr. Munby, in reply, said that he meant that the science suggested for a student should be given at the commencement of his career, and should be pure science, which should form the groundwork of his education. The applications of science should come year by year as they were wanted, but if the groundwork of elementary science was not there it would be very difficult for the applications to be taught and for the whole work to be done in the time at disposal. For example, in a course on the application of the laws of heat, it would be very difficult to get in the work in the respective years if no knowledge of the science of heat had been obtained previously. As to geology, if the Geological Society could be induced to give the Association information as to sites from the architectural point of view, it would be very valuable indeed. He did not agree with Mr. Searles-Wood that it would not be worth while for a geologist to publish a book on geology for architects. A little book on the subject would possibly be read, whereas a busy architect would not take up the study of geology if he thought he would have to wade through the branches of the science not dealing with his work. What Mr. Watson said about testing sounded too severe. Everything that came on to a site need not be tested, for if the contractor knew that the architect made any tests it would be sufficient to make him supply good material, and the contractor would be far more likely to do this when he knew that an architect was able to analyse his materials. A merchant would not run the risk of having his goods condemned by sending in inferior material after one or two tests had been made. As to water analysis, he never intended to convey the impression that an architect should be able to advise his client entirely upon the analysis of water, but almost every educated person ought to know enough about water analysis to understand results. A little knowledge of this subject in quite general terms would be of great value to an architect, as it was necessary when a country site was being selected to know what kind of water was to be had from a well, especially if it was near a churchyard or drainage. It was a matter of taste whether science was a pleasure or not. Scientific study could form a nice recreation, and, for his part, he could not see much difficulty in the way of an architect having a few pieces of apparatus with which to make occasional tests, nor did he think that that would require much time, and he would even like to see every architect have a little laboratory attached to his office. He strongly agreed with the Chairman that elementary scientific work should be done at the schools. It should be the aim to impart such knowledge before a student started architectural work at all. Usually a student did not commence architecture before he was sixteen, and he was not too young even then to have had some elementary scientific instruction. What the Chairman said as to the schools seeing that scientific knowledge was given was perfectly true, and a great deal of science work, he might say, was done at schools. But what had to be remembered was that nearly all school work was governed by public examinations to a large extent. If the Institute of Architects did not intend to have more than the present miserable bit of physics in its Preliminary examination, it was not likely that the schools would trouble to teach more to those who thought of taking up architecture; and it rested with the Institute and such bodies, as to how much science was taught to students before they entered professional classes.

The meeting then terminated.

Opening of the New Premises.

On Tuesday afternoon the President and Committee of the Association held their first reception in the new premises at 18, Tufton-street, Westminster. Among those present were:—Mr. Aston Webb, R.A., Mr. H. L. Florence, Mr. E. T. Hall, Mr. A. W. Pite, Mr. J. P. Seddon, Mr. Seth Smith, Mr. Cole Adams, Mr. Blashill, and Mr. Alex. Graham.

Mr. H. T. Hare, the President, in a short speech, referred to the enormous increase in the work of the Association during the past few years and to the advantages for future progress gained by the occupation of the new premises and the acquisition of the valuable collection of casts in the museum. Reference was made to the debt (amounting to 5,347*l.* 18s. 2d.) which is still due on the building fund and the hope was expressed that the profession generally would do its utmost to reduce this debt.

Mr. Aston Webb, on behalf of the Royal Institute of British Architects, wished the Architectural Association Godspeed in its new venture; the offer of the museum premises had arrived at a time when the Committee were at their wits' end to find a suitable site or building. Mr. Webb referred to the recently-formed Education Committee of the Institute, and hoped that the Association would support it in carrying out the unified scheme for the good of the profession.

Mr. J. P. Seddon expressed pleasure and satisfaction at the consummation of the work, and said how thankful the museum authorities were that the museum will be of such great use to architecture.

The work is not yet completed, and there is still something to be done ere the school can be in comfortable working order, but all the classrooms and studios are now ready for occupation. It is a matter of the greatest value to architectural education in the country that the Architectural Association is at last housed in premises befitting its position as an educational body. Congratulations are due to all those through whose agency the new premises have been acquired and established and to the architect, Mr. Leonard Stokes, for the success with which he has added to and remodelled the old building to embody all the requirements of a school of architecture. The addition includes the library and Secretary's office and part of the classrooms and studios. The alteration to the galleries of the museum supplies all floors with perfect natural light, and for every study a large arc lamp over the middle of the well is provided, supplemented by electric lights. As soon as the casts have been replaced students will have galleries in which their work can be conducted under the most rosy conditions. We understand that a special committee of selection and classification will proceed, as soon as the workmen are clear of the building, to classify and group the various casts now carefully stored away. The necessity for careful classification cannot be too strongly urged in the interests of the students, as there is nothing so fatal to study as the confusion which has existed, and still exists, in many of the cast-rooms of our museums. With so much space at their disposal, the committee should endeavour to group the different sections in chronological order so that the student can readily grasp the historical progression of the styles, and thus provide himself with a visible sequence to guide his work in the studio and lecture-room. Entering from the entrance hall is the general office and library, beyond which is the Secretary's private office and Committee room. A common reading-room for members is placed near the entrance, while a refreshment room with scullery and cooking stove is provided off the museum, where students can be supplied with hot lunches and teas. Lavatories for both sexes are provided, and in the basement is accommodation for bicycles. A main staircase has been introduced to the galleries, and from there access is obtained to the studios and class-rooms. On the first floor are two classrooms with sliding partition which can be converted into a large room for general meetings. These classrooms are provided with abundant cupboard accommodation and an elaborate system of electric lighting. The lecturer is provided with a system of roller webs for diagrams behind the platform, which can be dropped and raised at will during demonstration, and for which special ceiling lights are provided. A master's room and dark-room for the camera club are also on this floor. On the second floor are two studios specially fitted, one with an arc lamp for modelling class, a cloak-room, lavatories, and water-closets. On the third floor are the studios for day students. These are entirely new, and are lighted from the roof. The building is heated by low pressure hot water throughout, and all classrooms are lofty and well ventilated. The new woodwork is throughout American basswood unpainted. Besides the satisfaction of having premises which are sufficient for all working necessities, it is gratifying to know that they are also excellently adapted for the social gatherings of the Association. The alterations were carried out by Messrs. Holloway Bros., and the Association is indebted for the consideration shown in the glazed tile work by Mr. Van Straaten, in granite work by Messrs. Cooper, Wettern, and Co., in sanitary fittings by Messrs. Bolding, in heating and ventilating work by Messrs. J. Jones & Sons.

THE SAVOY HOTEL EXTENSION.

The extension to the Savoy Hotel is nearing completion. The principal façade is now that to the Strand; on the ground floor it includes Simpson's restaurant and shops. The main conception is fine, and is characteristic of the work of Mr. T. E. Collcutt, the architect. The material, a soft warm grey terra-cotta, is happily chosen and is suitable to the delicate detail—perhaps too small in parts—of the freely-treated Renaissance front. The ground story, which includes a mezzanine, is carried up to a corbelled balcony of some projection, from which arise the angle bays treated in the upper stories as circular turrets, and also two central bay windows carried up four stories. A richly-bracketed cornice crowns these, over which is an attic story below the springing of a steeply-pitched roof, in which are two stories, and which is covered with glazed green Spanish tiles. Striking and original as some of the lower design is, the whole proportion of the front is not convincingly successful. The wide carriage-way leads under a bridge to the covered forecourt. The bridge is a charming feature, over which can be seen the façade of the inner block, which unfortunately is only partly visible from the street. The design of this façade is quiet and pleasing. Emphasis is given to the upper stories by an arched colonnade decorated with figure sculpture, and capped by a beautifully designed cornice, over which the green corrugations of the Spanish roofing tiles are gay and charming. It is unfortunate that some such treatment as this was not possible to the Strand front. The lower story of this block under the covered way is treated with green and grey marble rustication with Doric columns, having caps and bases of bronze. Inside, the hall is decorated with a beautiful plaster frieze, by Mr. Pegram, over panelling of well-selected figured Spanish mahogany, the cornice of which is carried round the great arch leading to the foyer, to the detriment—we think—of the arch. Square marble piers carry the beams of a coffered plaster ceiling. A marble stair leads down to the foyer, which is a square hall decorated by white panelling in the intercolumnar spaces between marble columns, which carry an entablature. The effect is dwarfed by a very heavy coved plaster ceiling. The Parisian Café, entered from the entrance hall, is treated in Louis XVth style painted white, the ornament being executed in fibrous plaster.

Simpson's Restaurant is entered from the Strand. The gentlemen's dining-room is panelled in fumed Hungarian oak with inlay, which does not add to the beauty of the design. The mantelpiece is a dignified feature, in which polished Sycamore columns have been used with fine effect. The plaster frieze and ceiling is not satisfactory. The ladies' dining-room is decorated in the Adam style. In the smoke-room is a freize and ceiling by Mr. Bankhart, which is the most interesting plaster work in the building. The freize consists of a

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series of band ornament of fruit and foliage, and the ceiling is divided into panels by a charming low relief leaf enrichment.

Six wrought iron balconies have been fixed in the south block, of the early Georgian period. The pair of wrought gates, with copper tablets, at Simpson's entrance, and the balcony which extends along the main cornice in the Strand, and returns to the courtyard, will be continued in the western block, which will be roofed in next month. A wrought iron balcony is placed outside the Parisian Café, and some big window grilles in Somerset-street at the back, the whole being designed by the architect, and made by Messrs. Starkie Gardner and Co., of Lambeth.

An "Otis" electric elevator installation has been provided. The electric elevator service (apart from the Otis hydraulic elevator installation in the old hotel block) will comprise seven electric passenger elevators, four freight elevators, and ten service elevators. All the elevators are magnetically controlled; the passenger and freight elevators from the car only, and the service elevators from the kitchen or main distributing floor. The car speed of the passenger elevators is about 300 ft. per minute (in one case 400 ft.). The passenger elevators have a lifting capacity in most instances of fourteen persons. The magnetic control device is actuated in each case by a lever handle switch in the car. The two-speed device permits of the car being started from a floor on the slow speed, until it has travelled a few feet, and being put back again to the slow speed when the car approaches the floor at which it is to be stopped. If the car is required to make only a short trip, or passengers prefer the slower speed, the car can be run at slow speed for its entire journey. A secondary or emergency switch is also provided in each passenger car. The car is immediately arrested and firmly locked to the steel guides or runners in the event of overloading, breakage of a lifting cable, excessive downward speed from any cause, whether ropes are broken or intact, or undue stretching of a lifting cable. The landing gates or doors to each lift are provided with safety fittings to prevent the car being taken away from a floor with gate left open or a gate or door being opened unless the car is at the same floor level.

The drainage and plumbing system at the new buildings is by Messrs. Doulton and Co., Lambeth, under the direction, and according to the plans, of Mr. J. R. Anderson, A.M.Inst.C.E., Engineer to the London Sanitary Protection Association. The underground drainage is of cast iron, the greater part being visible, and on the basement walls, or suspended below concrete floors, with iron inspection manholes, and access doors, with bolted covers, wherever necessary. The soil and ventilating pipes are all of 10 lb. hydraulic-drawn lead; and, in view of the height of the building, precaution has been taken to make the main anti-siphonage pipes 3 in. internal diameter. The main wastes for baths and lavatories are of 3 in. galvanised wrought iron tubing, and each branch waste, as well as each main waste, is provided with a special form of gun-metal expansion joint, to guard against fracture following expansion and contraction through the use of hot water. All disconnected wastes are also provided with ventilators, which, instead of being carried out through external walls, under or near window openings, are taken up above the roof line by means of special ventilating pipes. The hotel has its own water supply from a newly-sunk artesian boring, and storage capacity equal to 50,000 gallons is provided on the roof by means of a series of tanks coupled up to form one complete reservoir. As to the water service pipes, provision has been made for shutting off every fitting singly, or any particular floor or lavatory apartment. Meters are also introduced on many of the water service mains. The baths are of cast iron, white vitreous enamelled inside and out, with a wide rolled edge, and solid base; the front and side are extended to the wall. The fittings are of a screw-down pattern, with a removable standing waste, the supplies to valves being exposed, the whole of the arrangement being plated. A feature is the shower, one being provided with each bath, and actuated by a Doulton's patent mixing valve. The valve gives water at any required temperature, but it is so manufactured that hot water cannot be turned on first. To prevent splashing a hinged glass door is fixed with each bath. The lavatories are in polished statuary marble, with 18 in. skirting and an 8 in. frieze, and supported on shaped white metal legs. In the public rooms, both for ladies and gentlemen, the lavatories are fixed in ranges, and in the gentlemen's retiring-rooms Doulton's "Aldwych" pattern urinals are fitted. For the staff, spray baths are also supplied.

Messrs. Dixon and Corbitt and R. S. Newall and Co., Ltd., supplied the lightning conductors to the hotel.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A two days' meeting of the members of the Association of Municipal and County Engineers, arranged by the Northern Counties District, was held at Newcastle-on-Tyne on Friday and Saturday, May 6 and 7.

The opening day's proceedings were devoted to an inspection of the reservoir which is being constructed by Messrs. Hawkesley, as engineers, for the Newcastle and Gateshead Water Company, in the Upper Redesdale Valley at Catcleugh. The works are of great magnitude, and have been in progress since 1900. The new reservoir, when completed, will form a lake with an area of 270 acres, and will contain a storage capacity of 2,345,000,000 gallons. The neck of the valley is being bottled with a huge embankment of earth, pitched with stone, and containing an inner core of concrete. The works will send down an average daily supply of ten million gallons of water to Newcastle, and a further three million gallons will pass over the weir as compensation water.

On arrival at Catcleugh, the members were received by Mr. Henzell, the resident engineer, who explained the principal features of the work in progress. He said the work had been much interfered with by heavy rains and floods. The tunnel through which they were passing the water was 12 ft. 6 in. in diameter, and several times during the floods they had had the water over the top of the tunnel. For the last three months they had not run down less than ten million gallons a day. The chutes would pass eighteen million gallons, and when the quantity of water exceeded that they had to come out. The average rainfall of the district was 44 in.

The members were then entertained to luncheon, Mr. Henzell presiding. After luncheon,

Mr. F. J. Edge, of Newcastle, proposed the health of the officials and success to the Newcastle and Gateshead Water Company. He believed the works were unique in one respect, that this was the longest earth embankment at any waterworks in England.

The toast was heartily honoured, and Mr. Henzell spoke in acknowledgment.

The second day's meeting was held in the Council Chamber of the Town Hall, Newcastle-on-Tyne. Mr. W. Weaver, C.E., Kensington, President, was in the chair, and there were present Messrs. G. Laws, Newcastle; F. J. Edge, Newcastle; C. F. Wike, Sheffield; E. J. Silcock, Leeds; T. Hewson, Leeds; J. P. Dalton, Ryton-on-Tyne (Hon. Sec.); J. Young, Ayr; and others.

At the outset the Mayor (Alderman Anderson) offered the Association a most hearty welcome to Newcastle.

The President thanked the Mayor for the cordiality of his reception.

Mr. F. J. Edge proposed the re-election of Mr. Dalton as Honorary Secretary for the Northern Counties.

Mr. G. Laws, Newcastle-on-Tyne, seconded, and the proposition was carried.

Mr. Dalton thanked the members for his re-election.

Municipal Works, Newcastle-on-Tyne

Mr. F. J. Edge, City Engineer, read a paper on Newcastle-on-Tyne, and some of its municipal works. He said a new high-level bridge is now in course of construction by the North-Eastern Railway Company higher up the river, so that the trains from London to Scotland can continue their journey without having to be reversed at Newcastle Central Station. The tramway system consists of twenty-three route miles, all being double line except one mile, the number of miles of track being forty-five. The system commenced to be worked electrically in November, 1901. The cars are of the single-deck and double-deck type, and are all worked from one central power station, there being three car sheds, one in the centre of the city, one in the urban district of Walker on the east, one in the urban district of Gosforth on the north, and another one in course of erection in the western district of the city. The tramways extend outside the city boundary into Gosforth, Walker, and Benwell; there is no special feature in their construction, the rail being 100 lb. to the yard, and practically of the section adopted by the Standardisation Committee. During the past two years anchors have been used, principally those known as the "Winby" anchor, and the fish-plates those known as the "continuous rail joint"; it is proposed to lay about eleven miles of this track a year, and to use "Cooper" anchors and electrically-welded joints. Considerable street widening has been necessary in order to construct the tramway with double track, and during the past two years roads had to be lowered in a few places, so as to allow double-deck cars to pass under railway bridges; a new bridge had to be constructed to carry the tramway under the North-Eastern Railway at Walker, so as to avoid a very sharp turn at the foot of a steep hill; a road at Walker was raised about 7 ft., and the bridge carrying the waggon-way of the Elswick Colliery over the Scotswood-road was raised 18 in. to get sufficient head-room for double-deck cars. This last-mentioned work was the only one having any special features, as it was necessary to gain the extra head-room without altering the level of the colliery rails, owing to the waggon-way being worked by gravity. This was possible by placing cross-girders under the bottom flanges of the main girders in such a position that they would be between the tramway tracks, and therefore clear of the cars. As the colliery waggons could not be stopped until Friday night, and had to commence running again on Monday morning, it was necessary to build a completely new bridge, and work continuously to remove the old one and put the new one in place during the time allowed. The construction of the tramways was taken advantage of to repave some of the principal streets, and 91,000 square yards in the city are now paved with wood, and 28,000 square yards will be done during this year. The water supply, gas supply, and supply of electricity for private consumers is in the hands of companies, the corporation owning only the electric power station for the tramways and for the public lighting by electricity. The area of Newcastle, exclusive of the river, is 5,355 acres; the population is about 225,000. It is almost built up, and application has been made for an extension of the boundaries. If Walker and Benwell are added, the population will be increased to about 260,000. Walker, though a separate urban district of 1,149 acres, is the freehold of the city of Newcastle, there being other properties also belonging to the city, which is one of considerable wealth. What is probably the last remaining toll on goods entering or leaving a city in the United Kingdom exists in Newcastle, under the name of the "Through Toll."

Newcastle Corporation Tramways.

Mr. A. E. Le Rossignol, M.Inst.C.E., M.I.E.E., General Manager and Engineer, Newcastle Corporation Tramways, presented a descriptive account of the Newcastle Corporation Tramways. He said the history of the tramways in Newcastle commenced in 1878. After the Corporation had constructed about eight route miles of track, they leased the working of it to a company for twenty-one years, horses being the motive power. On the expiry of the lease the Corporation set about the reconstruction of the whole of the lines, which were then in a very bad state, and the introduction of electric traction; and, in the planning out of the system, a site which was owned by the Corporation approximately near the centre was chosen for the position of the power station, so as to enable direct current at 500 volts to be the system of supply. The site had several disadvantages to counterbalance the advantage of being near the centre, inasmuch as it was some distance, over a quarter of a mile, from the river, and 90 ft. above the water-level; and, further, it was all filled-in ground, being on the site of an old dene, or deep valley, which had been filled up level some time before. This situation rendered a special system of foundations necessary. The whole of the site for each building was excavated to a distance of 8 ft. below the basement level, all hard ground at either end being taken out, and a block of concrete formed the full distance and width of each building, 8 ft. thick, interlaced with steel girders, rails, all bolted and fish-plated together; and thus each building practically

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floats on the soft ground below it. The foundations of the chimney, however, situated at one side of the old valley as it was, were differently arranged, piles being driven down into the hard ground below, and a heavy block of concrete, 30 ft. square, formed on top of the piles. On this an octagonal brick chimney, 180 ft. high from the level of the concrete, was built up, with a clear internal diameter of 9 ft. The whole of the power-station buildings are steel framed, filled in afterwards with brick walls, with steel roof-principals, carrying wood roofs. Coal comes direct from the railway into the top of the boiler-house, being tipped direct into the bunkers; from there falling by gravity through automatic weighing machines into the hoppers of automatic stokers. There were twelve large-size Lancashire boilers installed, which supply steam to four slow-speed engines for traction purposes, and one high-speed engine for electric lighting. All the four big engines were of the vertical marine types, with Corliss valves, two being compound of 1,000 horse-power each, one triple-expansion of 2,000 horse-power, and one triple-expansion of 3,000 horse-power, made to the author's specification, was now being installed. These engines were all direct-coupled to the dynamos, and generate current at 550 volts, which was distributed to the various feeders through a large switchboard. In the basement below the cables pass along a subway to the ends of the various lines of conduits. In one respect the station was peculiar in that the whole of the circulating water for the surface condensers of the engines had to be pumped up a quarter of a mile and 90 ft. high from the river. As this would involve a big loss in the ordinary way, the water, after passing through the surface condensers, was carried back in another pipe to the pumping station, where the centrifugal pumps were situated driven by electric motors, and passed through turbines on the same shaft as the motors, thus helping to drive the pumps and returning about 50 per cent. of the power to the motor. By this means the cost of power for pumping purposes was reduced by about half from what it would otherwise be. A special high-lift centrifugal pump was used, the largest set being capable of delivering 3,000 gallons per minute to a height of 100 ft. The construction of the track in Newcastle was at the time it was commenced, fairly typical of all track construction being carried out at the time. The gauge is the standard 4 ft. 8½ in., and the rails were laid on a concrete foundation 7 in. thick, extending over the whole track. The rails weigh 101 lb. to the yard, and the double tracks were laid 3 ft. 6 in. apart in the narrow streets, and 5 ft. 8 in. apart where centre poles were intended to be used. Between the centres of the track the conduits, consisting of special fire-clay ducts, were laid solid in concrete; and, as the Corporation wished to avoid continually pulling up the streets as extensions were required, a larger number of ducts than were actually necessary at the time were laid in nearly all the streets. From the power station three main lines of ducts were laid, one of thirty ducts to the west, one of thirty ducts to the north, and one of twelve ducts to the east, and the manholes varied in size from 8 ft. square for the large numbers of ducts to 4 ft. square for any number of ducts up to nine. All sharp curves on the track were laid with increasing curvature, commencing with a long radius, and finishing with the required radius at the centre of the curve, and all had been laid to standard gauge; whilst the whole of the special work, points and crossings, had renewable hard steel centres, which were fixed in with white metal, and could be taken out when worn and new ones put down. Two systems of paving were in operation, namely, granite blocks and hard-wood paving, the latter having been adopted for the whole of the central portion of the city. Experience had shown, since the track was constructed, that the heavy bogie cars, which were run on some of the routes, cause a great deal of loosening of the paving, which originated from the hog-backing of the rails, due to the rolling out of the top fibres of the metal, and this hog-backing of the rail leaves a cavity underneath the base into which water finds its way, and acts as a hydraulic pump, each time a car passes over, to raise the adjacent paving. This showed up very much on the roads on which the heavy bogie cars run, and could only be cured by the insertion of anchors into the concrete below the rail, which hold the rail firmly down to the concrete, and prevent this action, and all the new work was being carried out with the anchors. The first rails used were 45 ft. in length, but the length had now been increased to 60 ft., and all joints were laid butted up together, a clip fish-plate being used, which holds the bottom flanges in line and prevents jumping at the joints. The overhead work was of heavy construction, 0.4 in. diameter trolley wire being used, suspended over the centre of the track by centre-pole brackets where the streets were wide enough, or by span wires and side poles where the streets were narrow; and automatic lever frogs control the trolley at junctions. Combined with the overhead work was the electric lighting, by arc lamps, of the whole centre portion of the town, 222 lamps being fixed at the top of the poles in the main streets. These lamps were supplied with current by separate cables from the power station, were forty yards apart, and were on alternate cables, so that should one series fail the street would still be supplied with half the usual amount of light, and in summer an economy could be effected by half of the lamps never being lit, whilst half were always turned out every night after twelve o'clock. The overhead work itself was divided up into the usual half-mile sections, which were fed by separate feeders in such a way that the breakdown of any outlying section did not affect the centre portion of the city. There were several types of cars in use; single-deck cars having to be adopted at first because of the existence of several bridges which prevented double-deck cars being used. The height under these bridges had now been increased, to admit double-deck cars, by lowering the road; but the single-deck bogie cars, of which sixty were originally ordered, were in very great favour with the travelling public, who find them convenient to get into and easy riding. These all had an open portion at each end, in which smoking was permitted, the only drawback being, from the smokers' point of view, that ladies frequently occupy these seats in the summertime to the exclusion of the smokers. These bogie cars were 40 ft. in length, with 15 ft. bogie centres, each bogie having equal-sized wheels of 31 in. diameter. And there were, in addition, twenty-two bogie cars of the same length, which had been built by the department with double-decks, and carried 102 passengers, these cars being principally used for meeting a heavy rush of traffic at any time. The single-deck bogie cars had two motors of 30 horse-power each, and the double-deck bogie cars four motors of smaller size. The remainder of the rolling-stock consisted of four-wheel cars, a few of these being single deck, and over eighty being double deck, of the standard type, driven by two motors.

The members then proceeded to inspect the power station at Manors, the car sheds and workshops at Byker, the Armstrong Park and Jesmond Dene, and in the afternoon the works in connexion with the construction of the new high-level bridge over the Tyne for the North-Eastern Railway.

THE LONDON COUNTY COUNCIL.

THE ordinary weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Battersea Borough Council 11,042*l.* for electric lighting purposes; Camberwell Borough Council 400*l.* for housing purposes; Lambeth Borough Council 18,435*l.* for paving works; St. Pancras Borough Council 19,000*l.* for electric light installation, and Wandsworth Borough Council 5,785*l.* for street improvements.

Springfield Estate, Upper Clapton.—On the adjourned further report of the Parks and Open Spaces Committee it was agreed after discussion that the supplemental estimate of 16,750*l.* submitted by the Finance Committee be approved, and that further temporary expenditure of that amount be authorised in connexion with the purchase of the Springfield estate, such expenditure being ultimately recovered.

Memorial, Brockwell Park.—The Parks and Open Spaces Committee recommended that the design of the drinking fountain proposed to be erected in Brockwell Park as a memorial to the late Mr. Candler (who was an Alderman of Lambeth Borough Council) on a site near the Water-lane entrance to the park, be approved. The recommendation was agreed to.

Factory and Workshop Acts.—The Building Act Committee submitted the following report:—

"The attention of the Council having been called by H.M. Inspector of Factories to the inadequate means of escape in case of fire from the factory premises situated at 31a, Old-street and 90, Goswell-road, a sealed notice under section 7 of the Factory and Workshop Act, 1891, was served upon the owner in 1900 requiring him to carry out certain requirements to provide means of escape for the persons employed on the premises. The requirements of the notice were not complied with, and a summons was therefore taken out for the purpose of enforcing compliance therewith. The summons was dismissed on the ground that the notice required the owner to construct a staircase in such a position as to necessitate a trespass being committed on a part of the premises occupied by another firm, and an appeal against this decision was dismissed by the High Court. By the Act of 1901, section 149, it is provided that the whole of a 'tenement' factory or workshop shall be deemed to be one factory or workshop, and it was therefore decided to serve a fresh notice upon the owner of the premises, the two factories, occupied by Mr. Pillivant and the Paper Cutting Company respectively, being treated as a tenement factory. The matter was referred to arbitration, and at the hearing the owner applied to the umpire to state a case for the opinion of the High Court as to whether or not these premises constituted a tenement factory within the meaning of the Act. The case came on for hearing before a Divisional Court on April 27, 1904, and the court decided that the premises were not a tenement factory within the meaning of section 149 of the Act of 1901. The Lord Chief Justice, in giving judgment, stated that the case gave him very great difficulty, because whatever construction was placed upon the section (whether that contended for by the owner or that contended for by the Council) it created difficulties; but looking at section 149 as a whole he felt the language contained in the definition of a 'tenement' factory was not sufficiently plain to enable the Court to say that these premises came within the definition, and he was of opinion that so far as a tenement factory was concerned the Act was intended to be limited to a building or buildings containing two or more factories in different occupations, the mechanical power for which was supplied from one source, and did not apply to buildings containing two or more factories in different occupation the mechanical power for which was obtained from different sources, as in the present case. The effect of the judgment is to make it impossible for the Council to deal with the premises under the Factory and Workshop Act, and we have so informed the Secretary of State for the Home Department. We report the facts for the information of the Council."

Improvements.—The following recommendations of the Improvements Committee were agreed to:—

"That the estimate of 2,300*l.* submitted by the Finance Committee be approved; and that the Improvements Committee be authorised to secure the widening of Bostall Hill to 50 ft. at its junction with Basildon-road in general accordance with the plan presented to the Committee on March 23, 1904, provided that one-third of the net cost of the improvement shall be borne by the Council of the Metropolitan Borough of Woolwich, and that one-third shall be charged to the tramways account, the remaining one-third being charged to the account of the improvement.

"That the estimate of 1,800*l.* submitted by the Finance Committee be approved; that consent be given to the widening of Blythe-road between Sterndale-road and Dewhurst-road and the continuation of Augustine-road into Blythe-road as carried out by the Council of the Metropolitan Borough of Hammersmith in substantial accordance with the plan presented to the Improvements Committee on July 26, 1899, and that a contribution be made of one-third of the net cost of the improvement, provided that such contribution shall be limited to 1,800*l.*

"That the offer of the Council of the Metropolitan Borough of Woolwich to undertake, at an estimated cost of 2,224*l.* 8s. 9d., certain paving and other works connected with the widening of Mill-lane, Woolwich, be accepted."

The Council adjourned at 7.30 p.m.

THE SURVEYORS' INSTITUTION.—At the annual general meeting of the junior members of the Surveyors' Institution, held on the 9th inst., the honorary secretary, Mr. W. S. Walker, retired, and Mr. Sydney A. Smith, of 22, Chancery-lane, was appointed in his place. At the meeting which followed a paper was read by Mr. Smith on the subject of "The Junior Surveyor." Owing to the large attendance the meeting had to transfer to the Great Hall. A long discussion followed the paper.

HYDROPATHIC BUILDING, CLIFTONVILLE, MARGATE.—On the 4th inst. the opening took place of this new hydropathic establishment, which, in addition to the baths, etc., is arranged as an up-to-date hotel. A feature of the building is a roof garden, which is reached by a lift. The roof was executed by Vulcanite, Ltd., of Cannon-street, E.C., and Laganvale, Belfast. The architect of the building was Mr. S. E. Burrows, of Margate, and the builders were Messrs. Anderson Brothers, also of Margate.

WAR MEMORIAL, DUBLIN.—A memorial to the men of the Dublin Company of the Imperial Yeomanry who were killed in the South African war was recently unveiled in the grounds attached to St. Andrew's Church, Dublin. The memorial consists of a Portland stone pedestal with a polished granite shaft, supporting a Corinthian carved capital, surmounted by an imperial crown. There are four panels on the pedestal. The monument has been erected from the designs of Mr. A. E. Murray, architect, the contract being carried out by Mr. L. F. Harrison, of Dublin.

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APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Lewisham.—Buildings on a site abutting upon the north-east side of Kirkdale, south-east side of Peak-hill-road, and south-west side of Peak-hill, Sydenham (Messrs. Tompkins and Connew).—Consent.

Kensington, South.†—Residential flats on a site abutting upon the north side of Holland-street and east side of Campden-hill-road, Kensington (Mr. W. G. Hunt for the Kensington Estates Company, Ltd.).—Consent.

Deptford.—A porch in front of "Tressillian Lodge," Tressillian-road, Brockley (Messrs. Adams and Son for Mr. H. Richardson).—Consent.

Hackney, Central.—A one-story shop upon part of the forecourt of No. 261, Mare-street, Hackney (Mr. R. W. Hobden for Messrs. Scopes and Sons).—Consent.

Hackney, North.—The erection at No. 43, East Bank, Stamford Hill, Hackney, of an oak and tile porch to the front entrance and of an oak and tile pent over the side entrance, abutting upon Dunsmure-road (Mr. W. J. Ellis for Mr. T. Saxon).—Consent.

Kensington, North.—The retention of an iron and glass porch in front of No. 79, Cambridge-gardens, Kensington (Messrs. Frend, Houchin, and Morris for Dr. W. Roberts).—Consent.

St. George's, Hanover-square.—Oriel windows at No. 33, Dover-street, Piccadilly (Mr. J. S. Gibson for The Mexborough House, Ltd.).—Consent.

Kensington, South.†—A one-story building in front of the Oratory House, Brompton-road, Brompton (Messrs. Johnson, Saul, and Co. for the Very Rev. Father Bowden).—Refused.

Dulwich.†—A one-story building at the rear of No. 21, East Dulwich-road, Dulwich, to abut upon Solway-road (Mr. A. E. Mullins for Mr. E. Mathews).—Refused.

Fulham.—Two one-story shops over the District Railway on the west side of North End-road, Fulham (Mr. G. Estall for the Metropolitan District Railway).—Refused.

Lewisham.—One-story shops upon part of the forecourt of No. 62, London-road, Forest-hill, Lewisham (Mr. A. W. Coombs).—Refused.

Width of Way.

Peckham.†—A building on the site of No. 7, Elizabeth-terrace, McDermott-road, Peckham, with a forecourt boundary at less than the prescribed distance from the centre of the roadway of the street (Mr. W. D. Crowhurst).—Consent.

Clapham.—Permission to retain Nos. 27, 29, and 29A, Upper Orchard-street, Lyham-road, Clapham, with the forecourt fences at less than the prescribed distance from the centre of the roadway of the street (Mr. G. Herridge, junr.).—Consent.

Bermondsey.—Rebuilding of "The Brunswick" public-house, No. 148, Old Kent-road, Bermondsey, with external walls as less than the prescribed distance from the centre of the roadway of Alfreton-street (Mr. W. M. Brutton for Messrs. Truman, Hanbury and Buxton, Ltd.).—Consent.

Islington.—A one-story building in the yard of No. 10, Pleasant-passage, Holloway-road, Islington, with the boundary of such yard at less than the prescribed distance from the centre of the roadway of Slaney-place (Mr. A. E. Symes for Mr. P. C. Farmer).—Consent.

Kennington.—A one-story building at the rear of No. 4, Cobbett-street, Clapham, with external walls at less than the prescribed distance from the centre of a roadway next those premises (Messrs. Flood and King for Mr. F. C. N. Flood).—Consent.

Limehouse.—Buildings on the site known as "Old Wheatsheaf Wharf," on the east side of High-street, Wapping, and of other buildings on the west side of that street between Wapping-dock-street and No. 107 (Mr. J. Brewer for the governors of the Bridewell Royal Hospital).—Consent.

Southwark, West.—A building on the east side of Harrow-street, Southwark, with external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. G. Lethbridge for Messrs. T. Peet and Son).—Consent.

Whitechapel.—That the application of Messrs. Plumbe and Harvey for an extension of the period within which the erection of buildings on the northern and southern sides of Romford-street, Commercial-road, East, Mile-end Old-town, was required to be commenced be granted.—Consent.

St. George's-in-the-East.—A warehouse on the south side of Wellclose-square, St. George's-in-the-East (Messrs. Nash and Detmar for the Tower Tea Company).—Refused.

Width of Way and Lines of Frontage.

Walworth.—A building on the site of No. 2, Merrow-street, Walworth, with a projecting one-story shop in front (Messrs. Goodwyn and Sons for Mr. A. Walker).—Consent.

Width of Way and External Woodwork.

Lambeth, North.—The erection of Nos. 77, 79, 81, 83, 85 and 87, Lambeth-walk, Lambeth, with oak mouldings to the windows and such buildings to abut also upon Fitzalan-street (Mr. R. C. Gleed for Messrs. P. and G. Geen).—Consent.

Lines of Frontage and Construction.

Marylebone, West.—An addition to the Capland-street school, St. Marylebone, and a play shed in the playground of such school, to abut upon Grove-road and North-street (Mr. T. J. Bailey for the School Board for London).—Consent.

Strand.—An external staircase at the Lyric Theatre, Shaftesbury-avenue, St. James', Westminster, to abut upon Great Windmill-street (Mr. A. B. Jackson).—Refused.

Islington, North.—Wood and iron additions to a temporary wood and iron building on the west side of Hornsey-road, Islington (Mr. A. Goodchild for the representatives of the Hornsey-road Baptist Church).—Refused.

Deviations from Certified Plans.

Strand.—Deviations from the plans certified by the district surveyor so far as relates to the proposed rebuilding of Nos. 85 and 86, Jermyn-street, and Nos. 10 and 11, Ormond-yard, St. James's (Mr. G. D. Martin for the Waterloo Syndicate).—Consent.

Space at Rear.

Holborn.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a stable building on the west side of Kean-street, Drury-lane, Holborn, with an irregular open space at the rear (Messrs. D. Cubitt, Nichols, Sons, and Chuter for Messrs. W. H. Smith and Son).—Consent.

Mile-end.—A deviation from the plans approved in respect of the erection of the "Black Boy" inn, and a shop adjoining, with stabling at the rear, on a site on the north side of Mile-end-road, westward of Globe-road, so far as relates to an alteration in the elevations and sections of such buildings (Mr. W. Husband for Mrs. E. A. Coake).—Consent.

Walworth.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of No. 389, Walworth-road, Walworth, with an open space at the rear (Messrs. Goodwyn and Sons for Mr. A. Walker).—Consent.

Kennington.—An addition at the rear of No. 71, Hartington-road, South Lambeth (Mr. T. R. Richards for Mr. G. A. Riddell).—Refused.

Paddington, South.—An addition at the rear of No. 16, Bayswater-terrace, Bayswater-road, Paddington (Messrs. Frank, Brown, and Humphreys for the Misses M. E. and E. F. Johnston).—Refused.

Cubical Extent.

Hoxton.—The erection at the Gutta Percha Company's premises, Wharf-road, Hoxton, of a building with two divisions each exceeding in extent 250,000 but not 450,000 cubic feet, and to be used only for the purposes of the manufacture of submarine cables as shown (Mr. P. E. Pilditch for the Gutta Percha Company).—Consent.

Westminster.—An addition to an existing two-story building at the premises of the Stag Brewery, Palace-street, Pimlico (Mr. M. P. Saunders for Messrs. Watney, Combe, Reid, and Co.).—Consent.

Formation of Streets.

Chelsea.—That an order be issued to Mr. G. D. Martin, sanctioning the formation or laying out of a new street, for foot traffic only, to lead from Brompton-road to Basil-street, Chelsea (Mr. D. H. Evans).—Consent.

Hammersmith.—That an order be issued to Mr. J. H. Richardson, refusing to sanction the formation or laying out of a street, for foot traffic only, to lead from Uxbridge-road to Stowe-road, Shepherd's-bush (for Messrs. Griggs Brothers).—Refused.

Height of Buildings.

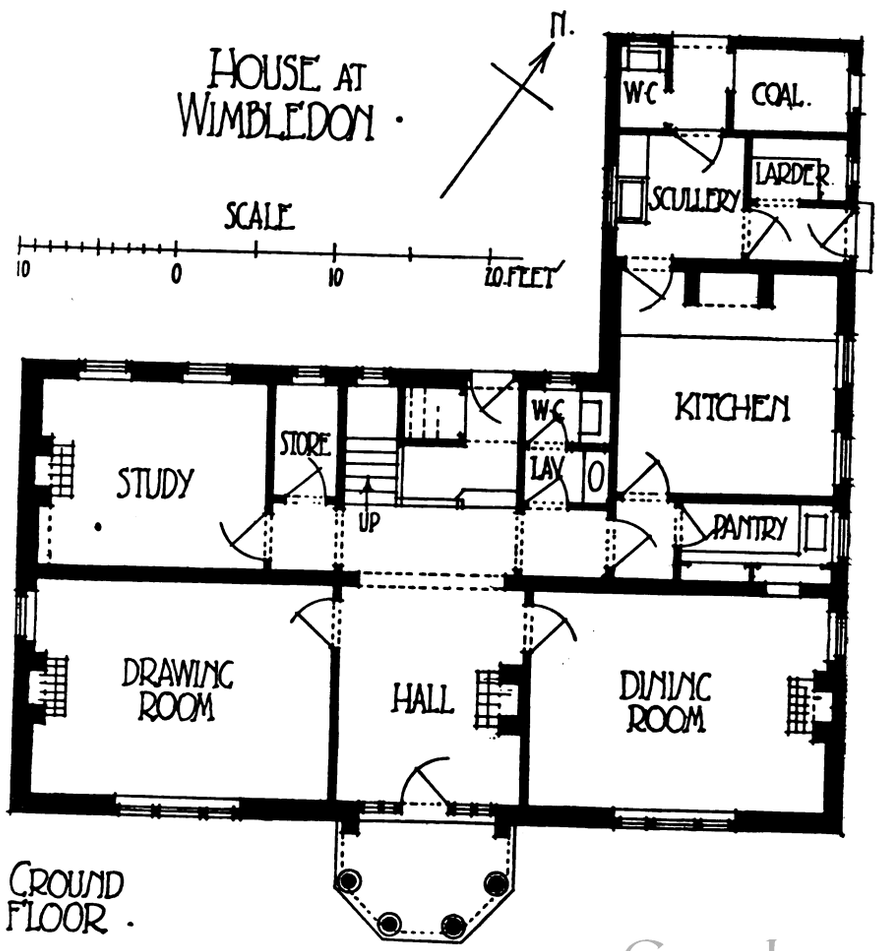
Whitechapel.—The erection of a portion of the south block of the Jews' free school, Bell-lane, Spitalfields, to abut upon Strype-street (Mr. E. R. Robson).—Consent.

The recommendations marked † are contrary to the views of the local authority.

Illustrations.

EXTENSION OF THE SHEFFIELD PUBLIC MUSEUM AND MAPPIN ART GALLERY.

THESE bulidings are in Weston Park, about a mile from the centre of the city of Sheffield. The museum is an old residence with modern galleries at the back. The Mappin Gallery is a building erected in 1890 from the designs of Messrs. Gibbs and Flockton in the Grecian Ionic



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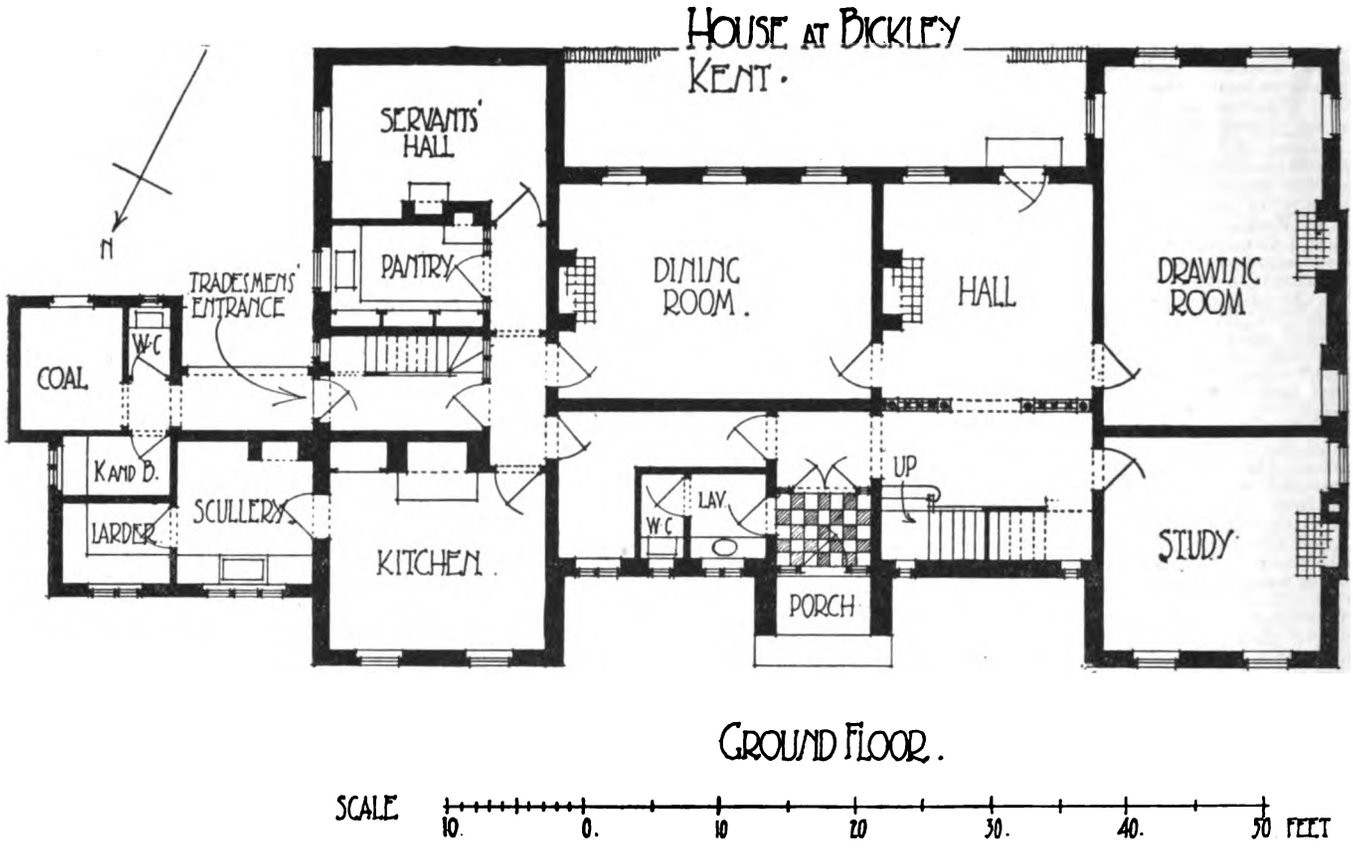


style, and is connected to the museum by a corridor.

The design is for extensions of both buildings and a combination of them, so as to present an important façade to the park.

The existing Mappin Gallery is the central feature, and the extensions are to be wings in advance of it and connected by quadrants, together forming three sides of an entrance court with Italian garden.

The existing buildings are marked on the plans by cross lines. The principal feature of the interior of the new museum will be the Long Gallery, which will connect the other galleries and be a side approach to the Mappin Gallery and on its axial line.

GIBBS AND FLOCKTON.

HOUSE AT WIMBLEDON.

THIS house, in a somewhat altered form, is built at Wimbledon. The walls are rough cast, and the roof is covered with red Wrotham tiles.

The builders are Messrs. Garrett and Son, Balham Hill, S.W. Mr. Ernest Newton is the architect.

HOUSE AT BICKLEY.

THIS house is being built at Bickley.

The site has many old trees and an old walled garden.

The materials are red Wrotham bricks and tiles; the windows are painted white, and the sun shutters green.

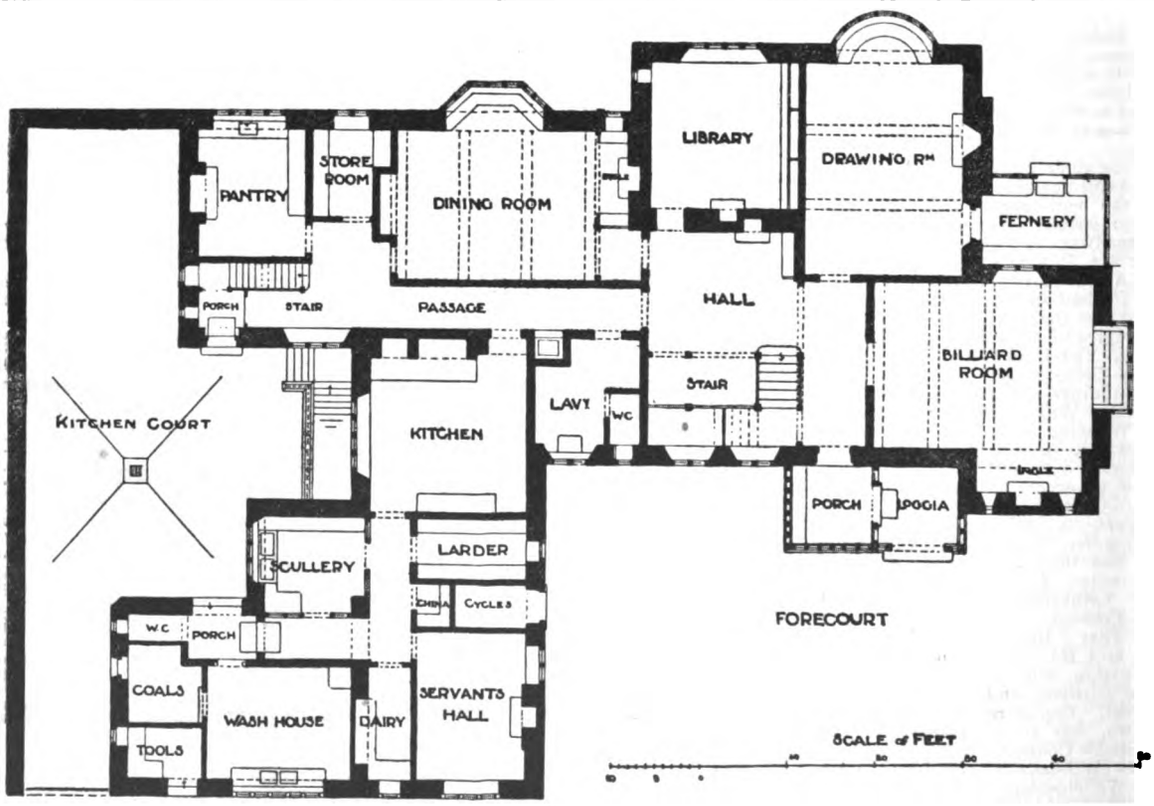
The builder is Mr. F. P. Duthoit, of Bromley, Kent. Mr. Ernest Newton is the architect.

"BIBSWORTH," WORCESTERSHIRE.

THIS house, now nearing completion, lies on a slope of the Cotswold Hills, overlooking the Evesham Vale. It is built of locally-quarried stone, with stone slated roof, oak mullioned windows, and latticed lights, and red-brick chimney stacks. The house, stables, and gardens have been designed by Mr. E. Guy Dawber, of London; the builders being Messrs. Espley, of Evesham. The whole of the lead-glazing and iron casements have been made by Mr. John Pye, of Moreton-in-Marsh.

"BRAHAN," PERTH.

THIS is a view of the garden part of a house built from the designs of Messrs. Bedford and



"Brahan," Perth. Plan.

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Kitson, of which some illustrations have already been given.

A plan of the ground floor is appended.

ALL HALLOWS VICARAGE, LEEDS.

THE new vicarage was built in 1903 on a site to the north of the church. The terrace, running along the south of the house, slopes down to the churchyard, the steps leading to the vestry door. The dining-room and drawing-room are separated by large folding doors so that the two rooms can be thrown into one large room for parish meetings, ladies' sewing-parties, etc. The external walls are built of local red bricks, a fine sandstone being used for the doorway, window sills, etc.; the roofs are covered with red tiles. The principal contractors were Messrs. Myers and Sons and Messrs. Atkinson and Sons, of Leeds. The architects were Messrs. Francis W. Bedford and Sydney D. Kitson, of London and Leeds.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The members of this Association journeyed to Dunfermline on Saturday last week for the purpose of viewing the Abbey and the new Carnegie Baths and Gymnasium. At the north porch of the Abbey the various changes of style in the group were explained by Mr. Hippolyte J. Blanc, who ventured the opinion that the generally-assigned date of 1070 could scarcely be supported in view of what was known to have been the practice in architecture in Scotland at that time. He pointed to several details as bearing evidence of the structure belonging to the early part of the XIIth century. Special attention was drawn to the doorway newly opened out in the south wall, Mr. Blanc remarking that from the capitals it doubtless formed one of the accesses to the cloister of the original Abbey buildings, and expressing the hope that the doorway would be fully opened out. As to the two niches in the north porch, Mr. Blanc thought they were not likely to have been placed as holy water vessels, as was so often assumed, but to have been recesses cut into the wall, probably for the accommodation of offertory plates. The party were afterwards conducted by Mr. Blanc over the baths and gymnasium, of which he is the architect.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—At a numerously attended meeting of this Institution, held at the Westminster Palace Hotel on the 6th inst, a paper on "The Design of a Dry Dock" was read by Mr. A. W. Young, of the Admiralty Works Department (member). The Chairman, Mr. S. Cutler, Junr. M.I.Mech.E, presided. The author dealt with the subject chiefly from the designer's point of view, and further restricted his observations to questions affecting the stability of the structure more than to elements relating to the outline either in plan or profile. The type of dock considered was of the class usually constructed by the Admiralty for the docking of His Majesty's ships, although the diagrams shown did not represent any particular dock. It was pointed out how serious the questions of length, width of entrance and depth over sill for dry docks had become, and, to illustrate the rapid growth of ships in beam and draught during the last sixty years, a diagram was exhibited giving the profiles of ships of sixty years ago and the development of their lines up to the present time. Allowance for future extensions of beam and draught in ships was touched upon, the author stating that this was quite a matter for the naval architect to decide. No matter how long or how broad the docks were made, it really seemed that, directly they were completed, ships were designed that filled them, and so gave cause for reflection as to whether sufficient margin had been allowed, although seeming ample at the time the lines for the docks had been decided on. After these general remarks, the question of the profile was touched upon under (*a*) convenience in docking ships (*b*) space for facilities in carrying out repairs (*c*) restriction of cubic contents as far as possible. Under section (*a*) the spacing of the altars and its bearing on the shoring of the ships was dealt with; under (*b*) the value of the head-room beneath the ship, owing to the very flat bottom of the present-day ships, which head-room affected the level of the floor of the dock in its relation to the level of the entrance sill; and under (*c*) the amount of pumping to be done in emptying the dock. In dealing with the question of stability, the author urged the advisability of making borings to ascertain first the general lie of the various strata, and also of sinking trial pits at intervals for more detailed particulars. Much inconvenience would be avoided by having reliable information as to standing water level and a knowledge of the nature and properties of the ground in which works of magnitude were constructed. The stresses in the walls and floor were fully treated, and their amounts at various points given. Referring to the results and conclusions arrived at he suggested that instead of a beam, the dock floor more nearly approached the form of an arch, but he would prefer to describe it as neither the one nor the other, but rather as "one side of a concrete structure subject to pressures in vertical and horizontal directions simultaneously." To arrive at the section best suited to resist the stresses induced must be by trial and error. If, however, the engineer did not wish to have such thick floors, the system of putting pipes through the floor to relieve the hydrostatic pressure could be adopted, providing the foundations were not of such a character as to be injuriously affected by the water passing through, but an objection to this was the pumping rendered necessary during the time the docks were in use, which, if extensive, would be a heavy annual charge; it, therefore, was a question as to whether the first cost for a thicker floor would not be more economical than paying for the increased pumping. The steps and timber-slides, the drainage-culverts, the pumps, the capstans, and bollards, etc., were referred to, and also the methods adopted in construction and the materials employed. In considering the dock entrance, the parallel-sided caisson by means of which it was closed, was fully described and illustrated by diagrams. The distribution of the loads on the caisson groove from the keel, and the process for finding the centre of gravity and centre of buoyancy were entered into, and remarks made as to the relation those centres bore to each other. The working of the caisson in opening and closing the dock was also considered. The author stated in conclusion that a dock designed as described would cost: For the dock, 225,000*l*., which is equivalent to 22s. per yd. cube, measured externally, or 39s. per yd. cube of internal capacity, or, again, 321*l*. 10s. per ft. cube of dock. Pump wells, culverts, and penstock shafts, 25,000*l*.; engine and boiler house, 18,000*l*.; penstocks, 6,000*l*.; caisson @ 2*l*. 4s. 6d. per ft. super of entrance, 8,000*l*.; total 282,000*l*. The paper was illustrated by a large number of diagrams, and in the discussion which ensued Messrs. Adam Hunter, F. W. Hodgkinson, A. R. Gibbs, R. G. Keevil, L. H. Rugg, J. W. Nisbet, C. W. Pettit, A. W. Metcalfe, G. H. Hughes, and G. W. Brake took part. A vote of thanks having been accorded the author, the meeting closed with the announcement of the visit on the 12th inst. to the Great Northern, Piccadilly, and Brompton Railway Works.

THE SLATE TRADE.—In the Carnarvon district, orders are coming in more freely, and prices are being well maintained. The working of a large area of brown land for slate on co-operative principles is being advocated, but the promoters should bear in mind that the brown land on the Bangor and Festiniog slate veins (on which the paying quarries are situated) has been for many years leased to various companies, and that the area is limited and very well defined.

FABLES FOR CHILDREN IN RESPECT TO THE DANGER OF PLAYING WITH FIRE.—The British Fire Prevention Committee are enabled, through a donation from a Canadian member, to offer the Committee's Gold Medal and a Purse of 20*l*. for the best fable for children, calculated to serve as a warning against the danger of playing with matches or fire. The competition for this prize is open to British subjects resident in any part of His Majesty's dominions, and elementary school teachers are particularly invited to compete. The Executive of this Committee will act as judges, and will be assisted by a public schoolmaster, an elementary schoolmaster, and a schoolmistress as assessors. Two silver and four bronze medals will also be given as additional awards for meritorious essays. The conditions can be obtained at the Committee's offices, 1, Waterloo-place, London, S.W., upon application *by letter* only, enclosing a stamped addressed envelope.

COMPETITIONS.

BATHS FOR CLAPHAM.—The President of the Royal Institute of British Architects has nominated Mr. A. Hessell Tiltman, F.R.I.B.A., as assessor in the competition for the erection of baths at Clapham for Wandsworth Borough Council.

BOOKS RECEIVED.

THE COUNTY GENTLEMEN'S ESTATE BOOK, 1904. Edited and compiled by W. Broomhall. (London: The County Gentlemen's Association, Ltd., 2, Waterloo-place, Pall Mall, S.W.)

THE POCKET BOOK OF REFRIGERATION AND ICEMAKING. Edited by A. J. Wallis-Taylor, C.E. Illustrated. (London: Crosby Lockwood and Son. Price 3s. 6d.)

Correspondence.

STATUTORY QUALIFICATION AND THE R.I.B.A.

SIR,—I find that my name appears in a list of candidates issued to members of the R.I.B.A. by "The London Committee of Members of the Royal Institute of British Architects for the Statutory Qualification of Architects." Will you kindly allow me space to say that I have no connexion with this committee, and that I disapprove of its methods of procedure? So far as I am concerned I trust that members will vote for the men whom they consider best fitted to advance the interests of the Institute, whether their names are included in the circular referred to, or not. JOHN W. SIMPSON.

SIR,—In view of the circular letter, dated 5th inst., issued in the name of "The London Committee of Members of the R.I.B.A. for promoting the Statutory Qualification of Architects," with a list of names approved by that committee as candidates for election to the Council of the R.I.B.A., will you kindly permit me space in the *Builder* to state that, although my name is included in that list, and although, as I at present view the subject, I am in favour of the principle of Statutory Qualification, I am, nevertheless, under no pledge to any person or party, and, as to the future, I reserve absolute freedom of action and discretion in dealing with the subject?

In any case, it appears to me much to be regretted that this question should have been raised as a party cry in the election of the Council at this time, and in advance of the report which we are awaiting from the Committee of the R.I.B.A. upon it. I would add that, had I known beforehand the nature of the circular letter, as issued and expressed, I would on no account have permitted my name to appear in it. WM. H. ATKIN BERRY.

SIR,—I think that most architects will endorse Professor Beresford Pite's remarks in your last issue as to the unwisdom of electing the council upon "planks" or "platforms." As a general practice, I entirely agree with him, but there are exceptions to every rule. Fortunately, in our profession, we do not have many "burning questions," and, under ordinary circumstances, there would be no special reason for disturbing the ordinary, rather humdrum, routine.

Circumstances, however, are not ordinary just now. A question is before the profession which is of the most vital importance to it, and the conduct and treatment of which will have very far-reaching consequences. I venture to think, therefore, that our line of action is both necessary and justified.

I agree also with Professor Pite as to the importance of the personnel of the council, bearing in mind its many and important public duties. The council, including Associate members, numbers twenty-two. We have only nominated seven candidates who have not previously sat upon that body. Even if all of these should be elected, there would still be a balance of fifteen official nominees who might be supposed (taking Professor Pite's standpoint) to be a sufficient leaven. I think, however, that our nominees, whether judged by professional ability, practical capacity, or personal and social position, are certainly equal to the average of the council's nominees.

Referring now to your anonymous correspondent who writes with regard to registration. He frequently speaks of our committee as "Mr. Scott's committee." In justice to its promoters, I should say that it is not my committee. I had nothing whatever to do with its inception, but was invited to join as

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a supporter of statutory qualification for the last fifteen years, and I am proud to be its hon. secretary.

Your correspondent says that the Institute communication did not reach us in time for a certain meeting. As a matter of fact, it was never sent to us at all.

With regard to "the one redeeming feature," *three* of our members resigned, not several, after we decided to take the poll. Of these, two have never attended any meetings of the committee at all, and the third did not attend that particular meeting. They were, therefore, not in touch with the motives which prompted us, nor aware of many matters, small, perhaps, in themselves, but which, together, materially influenced our action. Were it advisable to do so, we could easily recruit our committee, not by units, but by hundreds.

We have received about 800 replies to our inquiry. Of these *thirty-seven* are *against* statutory qualification, and the remaining 760 odd are in favour of it. Doubtless more replies would come in if we were to issue a reminder, but it seems unnecessary, as we have already proved the enormous preponderance of feeling in favour of the movement.

We do not agree that we are "prejudicing the question," and, should our nominees be elected, the matter will still be discussed in "the calm, deliberate, dispassionate, and business-like consideration of the whole subject," which, we agree with your correspondent, is the proper spirit in which to consider it.

W. GILLBEE SCOTT.

May 10, 1904.

LONDON'S LEVELS.

SIR,—I was visiting the beautiful library and museum of the Corporation of London, at the Guildhall, the other day, and noticed, before leaving the Basinghall-street doorway, a curious old frame on which are depicted the varying sites and heights of London's "Principal Public and other Edifices above the River Thames." It was compiled by Frederick Wood, 28, Queen-street, Brompton, and William Moffat, 8, Middle-row, Knightsbridge, Land Surveyors, in 1828, and was published in September of that year for the proprietors by J. Gardener, 163, Regent-street, London; and is "Inscribed to the King's Most Excellent Majesty, George the Fourth." In a little square on the space appears the annexed "Example." "The level and place in the landscape of St. Paul's Cathedral being wanted, see under letter S in the alphabetical table, where will be found No. 217, 52.8.40, the first the number of the building in the landscape and numerical table, the second its level; and, by referring to the scale at the side of the landscape between the parallel heights 50 and 60, the Cathedral will be seen delineated. The landscape is divided from O (the high-water mark) into forty-four parallels, each 10 ft. in height, and the difference between the high-water mark and low-water mark is 18 ft."

This survey must have cost its makers much time and thought, and is worthy of a much better light than it mostly gets in the staircase corner.

WAYFARER.

FLOOR FOR DANCING-HALL.

SIR,—Will you, or any of your correspondents, kindly say what is the latest and most up-to-date method of constructing a spring floor for a large dancing-hall or ball-room? Any assistance or advice in this direction will greatly oblige

"Q."

NEW SCHOOLS, HORNSEY.—The opening of the Hornsey Higher Elementary School, the South Harringay School, and the Special Instruction School, in the Mattison-road, Harringay, took place recently. The schools are situated in the Mattison-road, Harringay, and consist of the Higher Elementary School, which has upon the ground floor a hall and classrooms. On the first floor there is a lecture-room, art-rooms, and laboratories. In the special instruction school there is on the ground floor a swimming bath, cookery kitchen, and laundry. On the first floor with an entrance from the playground there is the manual instruction room, and on the same floor, with an entrance on the Mattison-road side, a housewifery room. The South Harringay School (mixed department) comprises on the central floor a large hall and classrooms, and on the first floor, classrooms. There is, in addition, an infants' department attached to the school. In the higher elementary school there is accommodation for 340 scholars, and the cost of building and furnishing is 16,240*l*. In the ordinary elementary school the accommodation is for 900, and the cost of building and fittings 23,035*l*. The cost of the special instruction school amounts to 8,644*l*. Messrs. A. Mitchell and A. M. Butler, of Finsbury-circus, were the architects, and Messrs. McCormick and Son, of Islington, the builders.

The Student's Column.

ARCHES.—XIX.

FROM the preceding articles it must be evident to the reader that in every theory of the masonry arch certain assumptions are necessary, and, as an inevitable consequence, even the most refined mathematical processes can yield no more than approximately accurate results.

Although the stability of, and the strains in, a masonry arch cannot be determined with any close approach to accuracy, it is always possible to make adequate provision for safety by the adoption of ample dimensions. This necessarily precludes the adoption of the most economical designs, but the excess material so employed does not involve much unremunerative expenditure, owing to the comparatively inexpensive character of building stone and materials.

While it is wise to recognise the limitations of any theory, we do not wish for a single moment to disparage theoretical investigations, for these are always invaluable aids. Experience is a poor guide by itself, but studied with the assistance of theory, it becomes of great practical value. In the design of arches experience and theory must go hand-in-hand.

We devote the present article to various empirical rules derived from the study of existing arches. These formulæ will be found serviceable to the designer by assisting him to assume suitable proportions for any proposed arch previous to the application of theoretical tests, and by affording a means of checking dimensions obtained from purely theoretical methods. No formula derived from existing structures can show the degree of safety likely to be attained, and the chief aim of such rules is to indicate safe construction. As numerous arches have been built of excessive strength, many empirical rules lead to the perpetuation of unnecessarily massive construction. Other rules, based on lighter examples, may safely be used in ordinary cases, but as the actual dimensions of an arch do not by themselves afford any true criterion of stability, the designer must invariably take into account such factors as the nature of the loading, the quality, bonding and cementing of the masonry, the character of the earth at the abutments and below the foundations, and the construction and manipulation of the centring.

Fortunately, the failure of arches is of comparatively infrequent occurrence, and when failures do occur they may have little to do with the actual proportions of the structures, and are generally the result of attendant circumstances. Hence, notwithstanding the fact that arch failures are most instructive object-lessons, they do not bring us much nearer to the establishment of general rules for the most economical forms of design. The result is that some approved theory must be applied in the manner discussed in previous articles of this series.

In the following notes we deal with three essential dimensions:—(1) Thickness at the crown; (2) thickness at the springing; and (3) thickness at the abutment.

Thickness of the Arch Ring at the Crown.

To determine the depth and thickness of the keystone is the first step in the design of an arch.

Let t = thickness at the crown, in feet;
ρ = radius of curvature of the intrados, in feet;
r = rise of the arch, in feet; and
s = span of the arch, in feet.

Rankine says that to determine the thickness by direct deduction from the principles of stability and strength would be an almost impracticable problem, and that the best course in practice is to assume a depth for the keystone according to an empirical rule founded on the dimensions of good existing examples of bridges.

The following is his rule:—

"For the depth of the keystone, take a mean proportional between the radius of curvature of the intrados at the crown and a constant whose values are: for a single arch 0·12 ft., and for an arch forming one of a series 0·17 ft."

Hence we have:—

For a single arch, $t = \sqrt{0{\cdot}12\rho}$.

For one arch of a series, $t = \sqrt{0{\cdot}17\rho}$.

For underground archways Rankine adopts a similar empirical rule, also deduced from practical examples.

For a tunnel in ground of the firmest and safest kind the rule is:—

$$t = \sqrt{0{\cdot}12\, r^2 \div s}.$$

For a tunnel in soft and slippery materials the rule is:—

$$t = \sqrt{0{\cdot}27\, r^2 \div s} \text{ to } \sqrt{0{\cdot}48\, r^2 \div s}.$$

Trautwine's rule for the depth of the keystone in a first-class cut-stone arch of circular, or of elliptical, form, is:—

$$t = \frac{\sqrt{\rho + \frac{1}{2}s}}{4} + 0{\cdot}2.$$

For second-class work the thickness so obtained should be increased by one-eighth, and for rubble of fair quality or for brick-work the thickness should be increased by one-third.

Among French engineers, the following rules by Dejardin have found considerable favour. In these the constant is given for various ratios of the rise to the span of the arch. Thus:—

For circular arches:—

Where $\frac{r}{s} = \frac{1}{2}$, $t = 1 + 0{\cdot}10\rho$

$\frac{r}{s} = \frac{1}{6}$, $t = 1 + 0{\cdot}05\rho$

$\frac{r}{s} = \frac{1}{8}$, $t = 1 + 0{\cdot}035\rho$

$\frac{r}{s} = \frac{1}{10}$, $t = 1 + 0{\cdot}02\rho$.

For elliptical and three-centred arches:—

Where $\frac{r}{s} = \frac{1}{3}$, $t = 1 + 0{\cdot}07\rho$.

Croizette-Desnoyers, another well-known French engineer, gives the following rules for the depth of the keystone in arches generally:—

Where $\frac{r}{s} > \frac{1}{6}$, $t = 0{\cdot}50 + 0{\cdot}28\sqrt{2\rho}$

$\frac{r}{s} = \frac{1}{6}$, $t = 0{\cdot}50 + 0{\cdot}26\sqrt{2\rho}$

$\frac{r}{s} = \frac{1}{12}$, $t = 0{\cdot}050 + 0{\cdot}20\sqrt{2\rho}$.

Perronnet, the eminent French authority, followed no fixed rule in the design of his numerous bridges, and varied their proportions according to the quality of the material and the nature of various details. The following formula is generally attributed to him for application to circular and elliptical arches of all kinds:—

$$t = 1\tfrac{1}{12} + \tfrac{1}{13}s.$$

Thickness of the Arch Ring at the Springing.

The thickness of an arch at the springing is usually proportioned in accordance with the position of the line of resistance, obtained by theoretical methods, as already described. In the well-known examples of Stephenson, the thickness of the ring is from 20 to 30 per cent. greater at the springing than at the crown, and in Rennie's bridges the increase is about 100 per cent.

Trautwine's formula for the arch ring at the springing is:—

$$t = 0{\cdot}2\rho + 0{\cdot}1\, r + 2{\cdot}0,$$

where t = the thickness at the springing, ρ = the radius, and r = the rise, all expressed in feet.

The following rule is given by Professor Baker* for the length of the joints between the joint of rupture and the crown:—

"The length, measured radially, of each joint between the joint of rupture and the crown should be such that its vertical projection is equal to the depth of the keystone."

Expressed algebraically this rule is:—

$$l = t \sec\theta,$$

where l = the length of the joint, t = the thickness at the crown, and θ = the angle of the joint with the vertical.

By this formula the thickness of the arch ring can be computed at the *real* springing, which, as we have before pointed out, is at the joint of rupture. Calculation is unnecessary for that part of the arch below the joint of

* "Masonry Construction," p. 499.

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rupture if it be supported by solid backing, properly bonded with the arch ring.

The following are values for circular arches :—

$$\text{Where } \frac{r}{s} > \frac{1}{4}, \quad l = 2{\cdot}00\,t$$

$$\frac{r}{s} = \frac{1}{6}, \quad l = 1{\cdot}40\,t$$

$$\frac{r}{s} = \frac{1}{8}, \quad l = 1{\cdot}24\,t$$

$$\frac{r}{s} = \frac{1}{10}, \quad l = 1{\cdot}15\,t$$

$$\frac{r}{s} = \frac{1}{12}, \quad l = 1{\cdot}10\,t.$$

Thickness of the Abutment.]

Rankine says* that in some of the best examples of bridges the thickness of the abutments ranges from one-third to one-fifth of the radius of curvature of the arch at the crown.

Trautwine's formula for the thickness of the arch ring at the springing, $t = 0{\cdot}2\rho + 0{\cdot}1r + 2{\cdot}0$, also applies to the thickness of the abutment at the springing, and is recommended by him for "the smallest culvert or the largest bridge—whether circular or elliptical, and whatever the proportions of rise and span—and to any height of abutment. It applies also to all the usual methods of filling above the arch, whether with solid masonry to the level of the top of the crown, or entirely with earth. It gives a thickness of abutment which is safe in itself without any backing of earth behind it, and also safe against the pressure of the earth when the bridge is unloaded. It gives abutments which alone are safe when the bridge is loaded; but for smaller arches the formula supposes that earth will be deposited behind the abutments to the height of the roadway. In small bridges and large culverts on first-class railroads, subject to the jarring of heavy trains at high speeds, the comparative cheapness with which an excess of strength can be then given to important structures has led, in many cases, to the use of abutments from one-fourth to one-half thicker than those given by the preceding rule. If the abutment is of rough rubble, add 6 in. to the thickness by the above formula, to insure full thickness in every part."†

Fig. 82 illustrates the application of Trautwine's rule for determining the thickness of the abutment at the bottom.

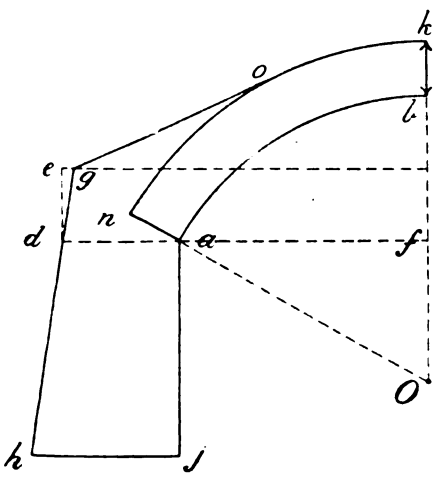

Fig. 82.

With the radius 0 *a* draw the arc *a b* representing half the intrados of the proposed arch. Compute the thickness *t* at the springing. Lay off *a d* equal to the thickness *t*, from *d* lay off vertically *d e* equal to half the rise *f b* of the arch, and from *e* lay off horizontally *e g* equal to one-forty-eighth of the span. Then the line *g d* produced downwards gives the back of the abutment, provided the thickness *h j* at the bottom is not less than two-thirds of the height *a j*. In very large arches or those with high abutments, it may be necessary to increase the thickness so as to provide for adequate resistance to earth pressure.

Continuing the construction in Fig. 82, we can thus find the thickness of the arch ring and backing.

Determine the thickness at the crown = *b k* by any of the formulæ given above, and draw the curve *k n* parallel to the intrados. From *g* draw a tangent to the extrados; then *g o k* will be the contour of the backing above the arch ring *b k n a*.

* "Civil Engineering," p. 428.
† "Trautwine's Engineers' Pocket-Book."

COURT OF COMMON COUNCIL.

THE usual fortnightly meeting of the Court of Common Council was held in the Guildhall on Thursday last week.

Paving Contracts.—On the recommendation of the Streets Committee it was agreed to extend certain contracts for paving.

It was reported that the following resolution had been received from the Camberwell Borough Council, it having been passed by the Assessment Committee of that Council:—"That this Borough welcomes the proposal of His Majesty's Government to amend the law for the purpose of promoting uniformity of valuation in London, but is of opinion that the Cities of London and Westminster and the Metropolitan Borough Councils should each have the appointment of the Assessment Committees, upon which the London County Council should also appoint one-sixth of the members; the London County Council to have power to make by-laws—to be approved by the Local Government Board, in conjunction with the Treasury—to secure uniformity in practice for valuation purposes, and that the Bill should be amended in its provisions to secure these objects." The resolution was referred to the Improvements and Finance Committee.

ROYAL COMMISSION ON LONDON LOCOMOTION.

AT the sitting of this Commission on Thursday last week evidence was given by Mr. Philip Dawson, M.Inst.M.E., Consulting Engineer to the London, Brighton, and South Coast Railway Company. He considered that "local traffic" in London would be best served by surface lines. Through traffic—traffic between London and the suburbs—worked by a system of electric railways. One great source of trouble to those railways possessing a heavy suburban traffic was the inadequacy of their terminal facilities. The terminal question was most difficult to deal with, both on account of the heavy expenditure which the necessary alterations would entail, and also because of the difficulties of working trains over lines belonging to a variety of companies. He suggested, as a remedy, decentralisation, or the dividing of traffic more evenly between the different termini, by running trains through London over existing lines, and so extending the unloading of trains over a large number of stations, instead of discharging all passengers at a single terminus. Witness described what was done in this direction by the various companies. Dealing with the advantages of electrification of railways, he said that, besides benefitting the public, electrification would be a great advantage to the companies, as electricity was far more economical than steam power. The present steam locomotive cost nearly the same to haul a train of two or three cars as a train of twelve or fourteen cars. Locomotive costs were more or less proportional to the train mileage. Moreover, fuel was being burnt when the train was coasting or stopping. With electrically-worked trains the power taken by the train was proportional to the ton mile, and a train could be split up into units. No energy was consumed except when actually working. Electric traction would double the speed on suburban railways. The people would, therefore, have a far greater choice of residence. If railways electrified their suburban systems the electric tramways would be valuable as feeders.

Mr. Stephen Butler Cottrell, M.Inst.C.E., member of the Association of Railway Locomotive Engineers, and Engineer-in-Chief and General Manager of the Liverpool Overhead Railway Company, described the working of that railway at some length. Coming to a consideration of the traffic problem in London, he advocated the construction of overhead railways to deal with urban traffic. Such railways should be placed where there were back streets, so that their unsightly appearance would not seriously matter, and where compensation would not be a serious item. Unfortunately, such streets were difficult to find, so that for rapid transit communication would have to be either by shallow subway railways or deep-level railways. Shallow subways had the advantage of not requiring lifts, but their construction was not possible in London owing to the nature of the subsoil.

Mr. H. E. Jones, M.Inst.C.E., then gave evidence on behalf of the Gas Companies Protection Association. He did not think that subways were really a way out of the road-opening difficulty. The gas companies should lay larger mains in the first instance.

On Friday evidence was given by Mr. G. F. Foulger, the Distributing Engineer of the Gas Light and Coke Company, who said that the company was the largest undertaking in the world, and served an area of 62½ square miles. They had 2,578 miles of cast-iron mains, irrespective of the wrought-iron service pipes or house connexions. It was a matter of public knowledge that in the past ten or twelve years there had been a great disturbance of the streets by the laying of pipes. This was not due so much to a company like his, which had been slowly growing for eighty years, but to the laying of distributing plant for the first time of electric lighting companies and local authorities. During 1903 his company had made 21,273 openings in this district, but of these 9,375 were of penny in the slot connexions which were in side streets, and 3,754 were in suburban districts where a service was being given for the first time. He would not be adverse to the proposal that where the local authority was repairing a street a company should be required to do what work was requisite for its service, and should afterwards be prohibited from opening the street for a period of nine months unless they could show good cause to the satisfaction of an independent person.

Professor Kennedy gave evidence on behalf of the ten principal electric lighting companies of London, with regard chiefly to the suggestion that public inconvenience would be minimised, if it were possible when a street was opened for other undertakers to carry out any requisite work at the same time. He said that the principal case in which co-operation might be possible was where the thoroughfare was closed in whole or in part through extensive operations, either of the local authority or of some undertakers carrying out particularly heavy work. To promote co-operation the first necessity was that the different undertakers, whether local authorities, government officials, or public companies, should be put under similar and reciprocal obligations as to the giving of notices. Fourteen days' notice might be given for all new road work and for any pavement work over 20 yds. in length, and these notices should be sent by the local authorities, the Postmaster-General, the gas and water companies, the hydraulic power companies, and the electrical companies. Another method by which inconvenience to the public might be diminished would be the carrying out of the reinstatement of pavement or road surfaces by the undertakers, of course with the approval and under the supervision of the local authority. Suggestions had been made for the use of subways as a means of getting rid of the opening up of the streets, but he did not think that witnesses had fully realised the nature of the problem. Even when practicable at all, the use of subways was absolutely restricted to a few very important thoroughfares, whereas electrical mains covered practically all the streets in the district. Two kinds of subways had been proposed before the Commission. The first was the London County Council type, which was at present used in Northumberland-avenue, Charing Cross-road, etc. He had examined these and thought there was great danger in putting electric-light mains and gas mains within the same limited space. The City of Westminster had suggested the use of subways extending from cellar to cellar, and large enough to provide for tramways, foot-passengers, etc. If the electrical mains could be placed close to the cellar wall, the difficulty of opening up the streets would be overcome, but the question of danger not only remained, but would be seriously increased. As to the practicability of providing one central authority to regulate the breaking up of streets throughout London, after full consideration of this question by the electrical undertakers, they did not think the creation of a central authority would be desirable in itself, or of use to the public. The different local authorities were really the best judges of the times at which each would like work to be carried out in its own district. The borough surveyors were charged with the making and maintenance of the roads, and he admitted that they must be the judges of what was satisfactory and necessary in road surfaces, but he did not admit the desirability of any interference by the borough surveyors or local authorities with the technical work of laying mains.

Mr. John Conacher, General Manager of the Metropolitan Electrical Supply Company, said that the practice with regard to the reinstatement of streets varied in the cases served by his company, and he believed the inconvenience complained of from delay in the

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permanent reinstatement by local authorities of both footways and roadways after they had been opened by supply companies would be greatly lessened by the extension and general adoption of an arrangement which existed between the Metropolitan Company and the Borough Council of Paddington and Holborn. In Paddington the council allowed the company to reinstate permanently all footways after mains had been laid, and also all roadways, except where they were paved with wood. The same arrangement existed in Holborn, except that where the paving was of wood or asphalte the council's own contractors were employed by the company, by whom they were paid direct. These arrangements had worked well, and he believed that similar arrangements could be extended to the whole of London with advantage to the public, and without loss to the boroughs. Witness, in other particulars, endorsed the views of the previous witnesses.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held at the City Hall on Thursday last week.

Sanitary Inspectors.—The General Purposes Committee brought up a series of regulations dealing with the duties, etc., of sanitary inspectors employed by the Council, and these were adopted. The regulations provide for the inspectors, when discovering a nuisance on any premises, furnishing a written statement of such nuisance to the person responsible and keeping a duplicate copy of such statement. They will be required to furnish to the Medical Officer of Health, on forms provided, a report on the premises inspected. Their hours of duty are to be nine to five, except on Saturday, when they shall be nine to one. No prosecutions shall be instituted until the matter has first been personally investigated by the Medical Officer of Health.

Widening of Piccadilly.—A letter had been received from the London County Council stating that the question of the possibility of widening Piccadilly between St. James-street and Duke-street to 80 ft. was under consideration. The leases in a large portion of the property are about to expire, and they wanted to know if the City Council were prepared to contribute towards the cost. The Improvements Committee considered that it was advisable, before dealing further with the matter, that a meeting should be held between the Improvements Committees of the two bodies. They recommended accordingly, and this was agreed to.

Gullies and Rain-water Pipes.—The Works Committee reported that clause 3 of the Drainage By-laws of the London County Council specifies that all rain-water pipes shall discharge in the open air, over or into a gully. Difficulty had been experienced in complying with the by-law, owing to the fact that the London Building Act permitted the whole area of the basement and ground floors of any premises to be built upon. The City Engineer had inquired of the London County Council whether a sealed gully within the premises would be deemed a compliance with the by-law, and had received a reply from the Superintendent Architect of the London County Council in the negative.

Bookplate.—It was reported by the Public Libraries Committee that they had accepted the design of Mr. W. W. Burgess, member of the Royal Society of Painter Etchers and Engravers, for an etched bookplate for the libraries in place of the various plates now in use. The design embodies the City Arms within a decorative border. The introductions are the Mitre and Crozier (showing the connexion with the Abbey), the Sword of State with the Orb and Crown (association with Royalty and the Seat of Government), and the Mace of the City. In the corners are the four national badges—the English Rose, the Scotch Thistle, the Irish Harp, and the Red Dragon of Wales.

Paving.—The Works Committee reported having had the question before them of the want of repair of the red gum-wood paving in Charing Cross-road, Whitehall, Broad Sanctuary, and Grosvenor-road. The City Engineer had obtained tenders for repairing the pavement, and it was recommended that the Improved Wood Pavement Company should execute such parts of the work as they are in a position to perform, and that the remainder be executed by Messrs. Mowlem and Co.

DURHAM COLLEGE OF SCIENCE.—In our account last week of the foundation-stone ceremony of the extension to this building, it is stated that Mr. W. H. Knowles is engaged in carrying out the designs of Mr. R. J. Johnson. This is not so; the late Mr. Johnson designed the first sections of the college, but the present additions, amounting to 50,000*l.*, are from the designs of Mr. Knowles.

OBITUARY.

MR. G. H. BIRCH.—Just as we go to press, we hear with regret of the death on Tuesday, May 10, of Mr. George Henry Birch, F.S.A., curator of the Soane Museum, in Lincoln's inn-fields, W.C. Next week we shall give some particulars of his career.

MR. NORMAN BROWN.—Mr. Norman Brown, architect, of Newport, has just died at his residence, St. John's-road, Maindee, at the age of forty-one. His plans for the new technical institute for Newport were selected in competition. Up to the present, however, the Corporation has deferred proceeding with the building.

ALDERMAN G. THACKRAY.—The late Alderman George Thackray, of Huntingdon, whose death took place on May 3, was born at Godmanchester, in 1834, and entered into partnership with his father in the building trade in 1855, which partnership continued until 1868. From this time until 1881 he directed the business himself, and with much success. In 1881 he took into partnership his eldest son, Mr. F. B. Thackray, who still manages the works in course of erection by Messrs. F. B. Thackray and Co., Ltd. He entered the Town Council of Huntingdon in 1874, was eventually elected an Alderman of this body, of which he was three times the head as Mayor. He was one of the first elected members of the County Council. This body also appreciated his public work by making him an Alderman of the County of Huntingdon. He was a Justice of the Peace for the County of Huntingdon, and was a guardian of the poor, etc. The deceased married the daughter of the late Mr. J. Bayliss, of the Foundry and Engineering Works, Huntingdon, and he leaves behind him six sons and four daughters.

MR. OLIVER.—We have to announce the death, a few days ago, of Mr. Edmund John Oliver, of No. 2, Fore-street, Bodmin, aged eighty-four years. Until his retirement in 1902, Mr. Oliver had been, during a period of twenty years, Surveyor and Sanitary Inspector to the Borough, and, on his resignation, was appointed Consulting Surveyor to the Urban District Council. He designed the buildings for the new cattle market at West Heath, Bodmin, opened in September, 1901; and was architect of the Lady Huntingdon's chapel in Fore-street, built in 1871.

GENERAL BUILDING NEWS.

CHURCH, HUDDERSFIELD.—The new Church of St. Matthew, erected at Primrose Hill, Huddersfield, was on Saturday last opened for public worship. The building is situated in Orchard-street, the whole having a total length of 100 ft., the width of the nave being 31½ ft., with narrow aisles. In the basement is a church council-room or choir vestry. The supervision of the work has been in the hands of Mr. J. William Cocking, of Huddersfield, the architect. The church is of broken random coursed walling inside and out, with hammer beam pitch-pine and Burlington blue slated roof. The whole of the interior wood and stone work is in the natural state. The accommodation is for about 360.

RESTORATION OF PARISH CHURCH, ISLINGTON.—The new chancel and the improvements to the nave which have been carried out in connexion with the Islington Parish Church have now been completed. The work has been executed from the plans prepared by Sir Arthur Blomfield and Sons, architects, by Messrs. Dove, builders, at a cost of 14,000*l.*

NEW CHURCH, STRATFORD-ON-SLANEY, IRELAND.—The new parish church of St. John, Stratford-on-Slaney, was recently opened. The work has been carried out from the designs of Mr. J. F. Fuller, architect.

SHIREBROOK CHURCH, NOTTS.—The church at Shirebrook, Notts, which has been enlarged, was recently re-opened. The new edifices consists of a nave, and the old church has been thrown into the new as a south aisle. The whole building gives seating accommodation for 800 persons, as against 200 formerly. A temporary chancel has been erected until funds permit the scheme to be carried out in its entirety. The architect was Mr. H. J. Price, Nottingham, and the general contractors were Messrs. Fisher Brothers, Mansfield. The walling has been built by Messrs. Wilkinson and Son, of Bulwell; heating and electric installation, Messrs. Thomas Danks and Co., Nottingham. Messrs F. Smith and Co., of London, are responsible for the temporary chancel; slating, Mr. A. Wright, Nottingham; oak seating, Addison and Co., Wellington, Salop. The general foreman of the works was Mr. W. Avery, and the cost of the work has been about 4,000*l.*

CHANCEL SCHEME, PARISH CHURCH, BRIGHOUSE.—A new chancel is being added to the Parish Church, Brighouse. The work is being carried out from designs prepared by Mr. C. Hodgson Fowler, architect.

NEW WESLEYAN CHAPEL, OLD CHESTERTON, CAMBRIDGE.—The foundation stones of a new Wesleyan chapel in Church-street, Old Chesterton, were laid recently. The architect is Mr. W. Wren, of Mount Pleasant, and the builders are Messrs. Kerridge and Shaw, of Cambridge. The cost of the work will be about 1,100*l.*

WESLEYAN CHURCH, SALTLEY, BIRMINGHAM.—The foundation stones of a new Wesleyan church, to be erected in Alum Rock-road, Saltley, were laid recently. The new edifice will afford accommodation for about 900 worshippers, and is estimated to cost about 4,500*l.* The main entrance from Alum Rock-road will be formed by two archways opening into a vestibule admitting into the body of the church. There will be separate entrances to the galleries, which will be approached by four staircases. The construction of the building will be of red brick with terra-cotta facings, the internal appearance of the church being enhanced by two rows of buff terra-cotta columns and arches carrying an open timber roof, the columns at the same time supporting the galleries. Mr. Arthur Harrison is the architect.

BAPTIST CHURCH AND SCHOOLS, GLOUCESTER-PLACE, BRIGHTON.—The opening ceremony of the new Baptist church and schools at Brighton took place on the 11th inst. The church is faced with whole white flints, with red dressings. The heating is by hot water. Electric light is provided. Accommodation—443 adults on ground floor, 282 in galleries; total, 725; or a mixed congregation of over 800 persons. Seating is arranged semi-circularly on plan; the ceiling is vaulted, and there are three vestries. There are schools for 500 scholars under the church, with various classrooms to the same. The front consists of three entrances, a large central gable, with five-light traceried window in the gable, with a tower on one side, terminated by a spirelet covered by oak shingles, with wrought-iron vane. Messrs. George Baines and R. Palmer Baines, Clement's Inn, London, W.C., are the architects, and Messrs. Battley, Sons, and Holness, Old Kent-road, London, S.E., the builders, the contract amount being 5,381*l.*, exclusive of galleries (except choir gallery) and upper portion of tower.

BAPTIST CHURCH, KILBARCHAN.—The new church erected by the Baptist Union of Scotland was opened on the 7th inst. The church, which is situated in the centre of the village, is seated for 400, and is of Gothic design, the outer walls being rough cast and the roof red tiled. There is also a hall capable of holding 200 persons, and a house for the church officer. The cost of the building, excluding the pipe organ, is 2,400*l.* The church was built from the designs of Messrs. A. and D. Barclay, Glasgow, and the general contractor was Mr. John Woodrow, Bridge of Weir. The pipe organ has been built by Messrs. R. Smith and Co., Glasgow.

HALL, DUNBLANE CATHEDRAL.—On the 22nd ult. a new hall for the Dunblane Cathedral congregation was opened. It is a building in the Scottish domestic style, and was designed by Sir Rowand Anderson, LL.D. It is in harmony with the buildings in Cathedral-square, and a contrast to the Cathedral. It is seated for nearly five hundred. It has cost with furniture 4,000*l.*

CHURCH HALL, HASWELL.—The new Church Hall, at Haswell, was opened recently by the Bishop of Durham. The building is from the plans of Mr. George Fox, architect, of London.

NEW SCHOOL, DERRY, IRELAND.—The new Strand House School in Asylum-road, Derry, has just been completed. The work has been carried out by Mr. R. Colhoun, builder, from the designs of Mr. M. A. Robinson, the architect.

EXTENSIONS TO THE ABERDEEN GRAMMAR SCHOOL.—The plans for the extensions of this school, prepared by Mr. J. A. Ogg Allan, architect, the master of works for the Aberdeen School Board, have now received the sanction of the Scottish Education Department. The cost of the proposed improvements is estimated at about 5,000*l.*

SCHOOL, HEWORTH.—The new Council school at Heworth was opened on the 2nd inst. by Mr. Francis Hogg, Chairman of the Education Committee. The building has been erected from designs prepared by H. Miller, architect, Felling, and the contractors were Messrs. Glen and Moffett, Jarrow.

READING ROOM, CADOXTON.—The formal opening of the new public reading room, erected on a freehold site belonging to the Barry District Council, at Cadoxton Common took place recently. The contract has been executed by Messrs. Gibby and Cleak, of Barry Dock. The architects are Messrs. Speir and Bevan, of Cardiff. The contract price was 1,025*l.*

NEW BANK PREMISES, WOOLER, NORTHUMBERLAND.—The new premises at Wooler, erected for a branch office for Messrs. Lambton,

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bankers, have been opened. The building stands on a site at the corner of High-street and Glendale-road. The plans were prepared by Mr. Rich, architect, Newcastle, the contractor being Mr. John Todd, Wooler.

MEMORIAL HOMES, BURY ST. EDMUNDS.—Two cottage homes for old soldiers of the Suffolk Regiment, which have been erected at Bury St. Edmunds in memory of Prince Christian Victor, were opened recently by Princess Christian. The homes have been built from designs by Mr. A. Ainsworth Hunt, of Bury St. Edmunds, architect and surveyor to the West Suffolk County Council, who acted as honorary architect. The building is in the Elizabethan style, of red brick and Broseley tiles, and in front, above the principal doorway, are the arms of the regiment with the date of the erection of the homes carved on a panel of Portland stone. The cottages consist of two suites of apartments, each consisting of a sitting-room, a kitchen and scullery, and three bedrooms. There is also a plot of garden attached to each. The builders were Messrs. Barbrook and Houghton, of Bury St. Edmunds.

NURSES' HOME, DUBLIN.—The James Weir Nurses' Home, in connexion with the House of Recovery and Fever Hospital, Cork-street, Dublin, was opened on the 6th inst. The building was erected and equipped by Messrs. H. and J. Martin and Mr. Howard M'Garvey, to the designs of Mr. W. M. Mitchell, R.H.A., and under the supervision of Mr. Patrick Hynes, the clerk of works.

NEW ALMSHOUSES AT WHIRLOW BRIDGE, SHEFFIELD.—These buildings have been erected for the Hollis Trust in three blocks. The central administrative block, which faces due south, contains, on the ground floor, a large combination room for the inmates, about 30 ft. by 26 ft.; and the superintendent's house, with parlour, and the usual offices. There is also contained on this floor accommodation for four inmates. Each inmate is provided with a living-room 15 ft. by 12 ft., with a bed recess, and with a bay window in addition to the above dimensions. There is also provided a scullery and coal bunker. The living-room is fitted with a Yorkshire range, so that each inmate can cook for herself. On the upper floor of this block there is accommodation for four more inmates, with bath-room in addition. The northern half of this floor is occupied by the superintendent's bedrooms and bath-room; and over the combination room, a sick-room and nurses'-room is provided. In the east and western blocks, which are one-story buildings, accommodation is provided for four inmates in each, making a total number of sixteen inmates. A small separate building contains a large wash-house fitted with coppers for the use of the inmates. The buildings have been built in local red bricks, and roofed with Broseley tiles. The plinth of the buildings has been executed in stone; and the gables and bay windows are finished in rough cast and oak timber quartering. The premises are finished internally in a simple manner, the whole of the rooms being plastered, and having wood floors, except the sculleries and halls, which are tiled. Gas has been laid on throughout the premises. The combination room has been made as comfortable as possible, with window seats; and by a French casement a small verandah is reached, facing due south, for the inmates' use. The drainage has been carefully executed, and the town water is laid on to the premises. The buildings have been erected by Messrs. W. and A. Forsdike, of Sheffield, from designs and under the superintendence of the architect, Mr. Howard Chatfeild Clarke, of Bishopsgate-street-within, London, Mr. R. Dale acting as clerk of works.

APPOINTMENTS.

UNITED GRAND LODGE OF ANCIENT FREE AND ACCEPTED MASONS OF ENGLAND.—His Royal Highness the Duke of Connaught, Grand Master, has been pleased to re-appoint, for the seventh year in succession, Mr. H. L. Florence to the office of Grand Superintendent of Works.

ST. SAVIOUR'S, SOUTHWARK.—Some American residents in London are about to collect a fund for the insertion of stained glass in the window of the vestry of the Church of St. Saviour's, Southwark, as a memorial to John Harvard. He was the son of Robert Harvard, who lived in a house opposite Boar's Head-court, close by the church; the register contains an entry of his baptism in the church on November 29, 1607. Having become a Puritan minister, Harvard emigrated to America and bequeathed a legacy to the school at Newton or Cambridge, which was afterwards reconstituted as a college under the name of the founder. The design of the window will, we are informed, be entrusted to Mr. Kempe.

MISCELLANEOUS.

SOUTH-WESTERN POLYTECHNIC.—On Friday evening last week the prizes and certificates gained by students of the South-Western Polytechnic, Chelsea, were distributed by Earl Cadogan, who also opened the additional buildings which have been recently erected. During the last session upwards of 1,000 students entered the various departments of the day classes, and 6,150 entered those of the evening classes, the numbers in each case showing a substantial advance over the previous session. In the examinations of the London University, four students passed the matriculation in the first division, five the intermediate science, one the intermediate engineering, and eight took their final degree as Bachelors of Science. The silver medal of the Board of Education for the National Competition in Art and a Senior County Scholarship of the Technical Education Board of the London County Council were conferred on students of the Polytechnic, two of whom also passed to Associateship in the Sanitary Institute. The new buildings have been erected from plans prepared by Mr. F. G. Knight, partly on ground available in the centre of the site and partly at the north and west sides of the Institute. Some of the work carried out has been of the nature of an alteration to the original buildings, rendering possible re-arrangements of certain departments, which will have the effect of greatly increasing the facilities for study, more especially for practical work. The additions include a great hall, bricklayers' workshop, plasterers' workshop, photographic rooms, boiler house, extensions to the mechanical and electrical laboratories, and wiring shop. The cost of the work (about 12,000*l.*) has been provided by grants from the late London Technical Education Board (who also provided nearly 6,000*l.* for the equipment of the buildings) and the Trustees of the London Parochial Charities.

ROYAL ORTHOPÆDIC HOSPITAL, OXFORD-STREET.—The hospital premises Nos. 297, Oxford-street and 15, Hanover-square are in course of being demolished, having been vacated on Lady-day. The governors have made arrangements for an amalgamation, under one charter of incorporation and one committee of management, with the National Orthopædic Hospital, No. 234, Great Portland-street, W., where upon some adjoining land they intend to build a hospital to accommodate 200 beds. They will also establish a branch hospital for 100 beds, in the north of London, for the treatment of special cases. Meanwhile they will occupy temporary premises at No. 55, Bolsover-street, W. The Royal Orthopædic Hospital, founded in 1838, was opened in Oxford-street in 1854. The freehold site extends over a total area of about 6,800 ft. superficial, in respect of which the Charity Commissioners made an order in July, 1902, to enable the trustees of the Charity to grant a building lease for a term of ninety-nine years at an annual rent of 1,400*l.*, the lessees agreeing to expend not less than 20,000*l.* upon new buildings, and having an option to purchase the freehold within three years for 40,000*l.*

TWO HOMES OF WILLIAM WILBERFORCE.—Broomwood House in Broomwood-road, on the western side of Clapham Common, has just been demolished, and the site will be occupied by a block of residential flats. William Wilberforce lived in the house in 1797-1808, during which interval his labours for the suppression of the slave-trade in the West Indies, and for other philanthropical objects, were rewarded with success. On May 10 will be offered for sale at the Mart a freehold estate of 192 acres at Hendon, known as Hendon Park, where Wilberforce at one time resided before he removed into London.

LIBERIAN TIMBER.—Mr. Errol MacDonell, British Consul at Monrovia, writes that, owing to the density of the forests and the lack of means of transport, very little is known of the timber and hardwoods of Liberia. Many woods of extreme durability and beauty are used for local building and furniture making, and, if properly treated, would undoubtedly have a commercial value. The bastard mahogany, ebony, and other African trees are well grown and abundant, and at some future date, when the vast primeval forests of Liberia are opened up, they will prove a source of revenue to the country.

ELECTRIC LIGHTING INQUIRY, CARNARVON.—An inquiry was held at Carnarvon on the 20th ult. by Mr. Malet, C.E., Inspector of the Local Government Board, into an application by the Corporation for sanction to borrow 17,000*l.* for the purpose of an electric lighting scheme. In the course of the inquiry, Mr. T. P. Wilmshurst, electrical engineer, Derby, gave evidence as to the objections to the scheme proposed by the North Wales Electric Power and Traction Company, which he considered would be very dangerous to life.

MASTER PLUMBERS' CONFERENCE.—The ninth annual conference of the National Association of Master Plumbers of Great Britain and Ireland was held at Southport on May 9, Mr. T. A. Armitage, Huddersfield, presiding. There were 150 delegates present from London and other large centres, including Staffs. and Yorks., the Association numbering 1,400 members. Councillor J. Boyd, Southport, referred to the great improvements that had of late been effected in sanitation, and matters affecting the plumbing and building trades. An inefficient plumber was, he said, a dangerous member of society, and the Association wished to make it impossible that there should be an ignorant, bungling plumber in existence. The Mayor of Southport (Councillor F. W. Brown) welcomed the delegates, and encouraged a form of decorative plumbing, which, he said, had lately been revived. Mr. Armitage, in his presidential address, said he was sorry that the question of co-ordination of examination had not been settled yet to their satisfaction, as there should only be one examining body throughout the country instead of two. He announced that Mr. Tonge, of Rochdale, had generously given some gold and silver medals for papers by members or their sons, and the competition would start at once. In the matter of the direct tendering to architects, they wished more success than at present. The heating and domestic engineers were forming an association in hostility, but they (the plumbers) were taking a determined stand on what was plumbers' work, and insisted that they were the people to do it. Mr. W. Jaffrey, Manchester, was elected President for the ensuing year; Mr. John Beal, Hull, secretary; Mr. A. B. Dyson, Halfax, treasurer. Mr. C. Thomerson, London, was elected on the Educational Committee. It was resolved that the August Central Board meeting be held at Chester, and the November half-yearly meeting at Bradford.

SANITARY OFFICERS.—The Local Government Board has sanctioned the following appointments:—Battersea—Mrs. A. C. Young, as an additional female sanitary inspector; Deptford—Mr. S. D. Wright, as an additional sanitary inspector; Hackney—Miss A. M. Newton, as an additional female sanitary inspector.

WORKMEN'S DWELLINGS, EXETER.—Mr. R. H. Bicknell, M.Inst.C.E., held an inquiry at Exeter on the 5th inst., on behalf of the Local Government Board, into an application made by Exeter City Council to borrow money for the provision of dwellings under part III. of the Housing of the Working Classes Act, 1890, for the accommodation of inhabitants of one side of Alphington-street, who are to be dispossessed of their dwellings, which are to be removed in order to make room for the St. Thomas improvement. The Council desired to appropriate land in Commercial-road. The Town Clerk (Mr. G. R. Shorto) stated that the area of the district was 3,358 acres, and the population at the last census 47,180. The total rateable value of the city was 250,073*l.*, assessable value for the borough rate, 249,686*l.*, and for the general district rate, 240,130*l.* The amount desired to be borrowed was 20,000*l.* Under the Exeter Corporation Act of 1902 the Council were given power to widen Alphington-street, and on the carrying out of the improvement a number of the working classes would be dispossessed of their dwellings.

WAR MEMORIAL, EARLEY.—A tablet was recently unveiled in the Parish Church, Earley, in memory of the men from that district who fell in the South African war. The tablet, which has been placed on the wall to the right of the chancel arch and near the lectern, is of gilt bronze, with embossed border and lettering. It has been designed and executed in beaten work by Mr. Bertram Reynolds, of Westminster.

CAPITAL AND LABOUR.

DUNDEE MASONS' WAGES.—A meeting of representatives of masters and operative masons in Dundee was held on the 5th inst. to consider the wages question. It was intimated that, in view of the present state of trade, the masters were not prepared to renew the present agreement, but that no reduction would be made meantime.

TEES-SIDE BUILDING DISPUTE.—There seems to be every probability that the struggle between the master builders of Tees-side and the Hartlepools and the bricklayers, plasterers, and their labourers is going to be a keen and determined one. Negotiations between the two parties have come to an end, and it will be remembered that a week ago the men came out on strike, refusing the employers' offer to extend the notice for a week whilst negotiations were continued. The employers at a recent meeting decided to throw open their shops on May 9 to any workmen at the following rates:—Bricklayers, 9½d. per hour; plasterers, 9½d.; bricklayers' labourers, Stockton, 6½d.; Middlesbrough,

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6½d.; the Hartlepools, 6½d.; plasterers' labourers, Stockton, 6¾d.; Middlesbrough, 6¾d.; Hartlepools, 7d. The bricklayers, plasterers, and labourers of the Hartlepools, who were served by the master builders with a notice for reduction in wages, but whose notice was subsequently extended for a week, in view of the possibility of a settlement, will probably join in the general strike which has taken place on Tees-side, all efforts to effect a settlement having proved futile.—*Darlington Star.*

Legal.

COLLS *v.* HOME AND COLONIAL STORES, LTD.

THE following are the concluding judgments in this important case.*

Lord Davey: My Lords,—I am of opinion that the finding of the learned Judge who tried this action as to the facts of this case is borne out by the evidence, and I accept his finding as the basis of my judgment. After describing the dimensions of the room on the ground floor of the plaintiff's premises which is used as an office, Mr. Justice Joyce says:—"It is, I think, the result of the evidence that it has ordinarily, if not always, been the practice to make use of the electric light in the back part of the room, and a most extraordinary amount of light from the windows in Worship-street would be required to enable the use of the electric light in the back part of the room to be dispensed with, even on ordinary days. Practically, I think it may be taken that the use of electric or some other artificial light is now and must always be necessary in order to light the back part of the room, even in the daytime. There is no evidence to show that such an extraordinary amount of light has been enjoyed or acquired for anything like the period of twenty years." And the learned Judge sums up his finding in these words:—"Apart from any question with respect to the back part of the plaintiff's premises and to the extraordinary light required, if it be possible to be obtained so far back in the absence of illumination by electric light, the plaintiff's premises would still, in my opinion, after the erection of the defendant's building be well and sufficiently lighted for all ordinary purposes of occupancy as a place of business. For all ordinary days they have amply sufficient light—at present they have abundance of light, and are, in my opinion, unusually well lighted. If, as it is contended on behalf of the plaintiffs, they are entitled to the full amount of light now enjoyed without appreciable diminution, the plaintiffs would have a good cause of action upon the erection of the defendant's building, though it might perhaps be doubted whether the diminution that would be caused by the defendant's building if and when erected is sufficiently serious to entitle the plaintiffs to an injunction."

On these findings the learned Judge, following the judgment of Mr. Justice Wright in Warren *v.* Brown, which had not then been reversed by the Court of Appeal, held that the action failed and must be dismissed. The Court of Appeal reversed this judgment. The legal grounds of their judgment are contained in a single sentence. "If ancient lights," says Lord Justice Cozens-Hardy, "are interfered with substantially, and real damage thereby ensues to tenant or owner, then that tenant or owner is entitled to relief." By the expression "interfered with substantially" I understand the Lord Justice to mean "if the amount of light having access to the premises by means of the ancient lights is substantially diminished." This proposition appears to me to assume or imply that the owner of the dominant tenement is entitled to have the full amount of light which has gained access to the tenement by the ancient windows during the previous twenty years maintained without substantial diminution. The "real damage" may be occasioned by an alteration in the internal structure of the dominant tenement which has been made within the period of twenty years or its adaptation within that period to some special use for which an extraordinary amount of light is required, but, nevertheless, if the proposition be sound, the owner or occupier of the tenement is entitled to be protected in the enjoyment of the light required for his altered premises or for the special use to which he has put them. In perfect consistency with this view of the law, Lord Justice Vaughan Williams expressed a doubt whether the rule of 45 degrees can any longer be applied even as a rough measure.

The question for your Lordships to determine is whether this view of the law is correct, or, in other words, what is the true nature and extent in English law of the easement of light. It must be regretfully admitted that the numerous decisions on this subject in the courts are not easily reconcilable and are not infrequently contradictory. No judgment of this House has been referred to, except that in the case of Jones *v.* Tapling (2 H.L. 290), the decision in which does not directly affect the point now before your Lordships. I do not propose to travel through the long catena of authorities. They were copiously referred to at the Bar, and the principal cases are stated and carefully analysed in the judgment of Mr. Justice Wright in Warren *v.* Brown.

My Lords, you will find that in the earlier authorities the obscuration of light to a tenement having ancient lights is dealt with on the footing of a nuisance. In Alfred's case (9 Co. 57A) the "hindrance of light" is treated in the same category as the nuisance of fouling the air by pigstyes. In the Fishmongers' Company *v.* East India Company (1 Dick 153) Lord Hardwicke said, "As to the question whether the plaintiffs' messuage is an ancient building so as to entitled them to the right of the lights, and whether the plaintiffs' lights will be darkened, I will not determine it here, for if it clearly appeared that what the defendants are doing is what the law considers as a nuisance, I would put it in a way to be tried. . . . But I am of opinion that it is not a nuisance contrary to law, for it is not sufficient to say it will alter the plaintiffs' lights, for then no vacant piece of ground could be built on in the City, and here there will be 17 ft. distance, and the law says it must be so near as to be a nuisance. It is true the value of the plaintiffs' house may be reduced by rendering the prospect less pleasant, but there is no reason to hinder a man from building on his own ground."

Consistent with this view is the direction of Best, C.J., to the Jury in the oft-quoted case of Back *v.* Stacey (2 Car. and P. 465). The learned Judge said, "It was not sufficient to constitute an alleged obstruction that the plaintiff had, in fact, less light than before, nor that his warehouse, the part of his firm principally affected, could not be used for all the purposes to which it might otherwise be applied. In order to give a right of action there must be a substantial privation of light sufficient to render the occupation uncomfortable, and to prevent the plaintiff from carrying on his accustomed business (that of a grocer) on the premises as beneficially as he had formerly done." In Clark *v.* Clark (L.R. 1 Ch. 15), Lord Cranworth stated the question thus:—"Whether the obstruction is such as to deprive the party of such a supply of light as he might reasonably calculate on enjoying." After saying that the plaintiffs' rooms were rendered less cheerful, he adds, "but I cannot think that this is such an obstruction of light as to amount to a nuisance. . . . What the plaintiff is bound to show is that the buildings cause such an obstruction of light as to interfere with the ordinary occupations of life." In Robson *v.* Whittingham, decided in the following year (L.R. 1. Ch. 442), the Lords Justices Knight, Bruce, and Turner expressed themselves as entirely satisfied with Lord Cranworth's judgment, and Lord Justice Turner accentuated his approval by saying that he thought this class of cases had been carried too far before the decision in Clark *v.* Clark was pronounced. Nothing that I can say will add to the respect and authority with which the opinions of those two learned and experienced Judges must command with your Lordships.

It has been thought that the third section of the Prescription Act (2 and 3 Wm. 4, c. 71) altered substantially the previously existing law as to ancient lights, and had the effect of conferring on the owner of the dominant tenement, by twenty years' enjoyment, an absolute and indefeasible right to the full amount of the light enjoyed during that period. And it must be admitted that the language of the section lends some plausibility to that opinion. It is, however, not consistent with the language of Lord Cranworth in Clark *v.* Clark, and the point was expressly determined by the Lords Justices James and Mellish in Kelk v. Pearson (L.R. 6 Ch. 809), decided by them in the year 1871.

Lord Justice James there says:—"I am of opinion that the statute has in no degree whatever altered the pre-existing law as to the nature and extent of this right. The nature and extent of the right before that statute was to have that amount of light through the windows of a house which was sufficient, according to the ordinary notions of mankind, for the comfortable use and enjoyment of that house as a dwelling-house, or for the beneficial use and occupation of the house if it were a warehouse, shop, or other place of business. That was the extent of the easement, a right to prevent your neighbour from building on his land so as to obstruct the access of sufficient light and air to such an extent as to render the house substantially less comfortable and convenient." The statute, in fact, has only altered the conditions or length of user by which the right may be acquired, but not the nature of the right.

In the case of the City of London Brewery Company v. Tennant (L.R. 9 Ch. 212), Lord Selborne expressed his complete adherence to the view of the law taken in the case of Kelk *v.* Pearson, correcting some impressions which might have arisen from the language used in some former cases by some learned Judges. This doctrine, however, has not been unchallenged. In an Irish case of Mackey *v.* Scottish Widows' Society (Ir. Rep. 11, Eq. 541), decided in 1877, Lord Justice Christian criticised in vigorous language the judgments of Lord Justice James and Lord Selborne, and held that the right is to an average maximum of the light which nature has been shedding upon the window for twenty years before the defendant interrupted it. It is also difficult to reconcile the language used by the Lords Justices Cotton and Bowen in the case of Scott *v.* Pape (31 Ch. D. 554), or the language of the Queen's Bench Judges in Moore *v.* Hall (3 Q.B.D. 178), with the decisions in Kelk *v.* Pearson and City of London Brewery Company *v.* Tennant, though the authority of those cases was not in terms questioned by them.

My Lords, I regard the decisions in Kelk *v.* Pearson and the City of London Brewery Company *v.* Tennant as complementary to, and on the same lines with, Lord Cranworth's judgment in Clark *v.* Clark. And so regarding it, I entirely approve of it. Lord Justice Romer, however, in delivering the judgment of the Court in Warren *v.* Brown (1902, 1 K.B. 15), seems to have taken a different view of the effect of Kelk *v.* Pearson. He says:—"Since Kelk *v.* Pearson it is impossible to hold properly that the statutory right is not interfered with merely because after the interference the house comes up to a supposed standard as to what a house ordinarily requires by way of light for purposes of inhabitancy or business," and he quotes some words used by Lord Justice Mellish at p. 814 of the Report.

I must remark that the particular point which was under discussion in Warren *v.* Brown, and in another form in the present case, was not before the Court in Kelk *v.* Pearson. There was no question there of a claim for protection in the use of an extraordinary amount of light required for some special purpose, or required for some unusual peculiarity in the internal structure of the building. And I regard what was said by Lord Justice Mellish as directed to the arguments addressed to the Court in that case. According to any standard short of holding that the right is to all the light which has come through the window, the right to light has a ragged edge to it, and it is impossible to assert that any man has a right to a fixed amount of light ascertainable by metes and bounds. I do not think that Lord Justice Mellish intended to differ from Lord Justice James, and in the City of London Brewery Company *v.* Tennant, when Lord Justice James repeated the substance of what he had said in the earlier case, Lord Justice Mellish, according to the report, contented himself with a simple concurrence.

My Lords, I must trespass on your indulgence for a few moments by adverting to an impression which has been entertained by some distinguished Judges, and was the subject of argument at the Bar, to the effect that within the space of a few months Lord Cranworth overruled himself. The judgment in Clark *v.* Clark was delivered on November 25, 1865, and that in Yates *v.* Jack was delivered on March 24, 1866. It was thought by Lord Chelmsford in Calcraft v. Thompson (15 W.R. 463) that the effect of the later case was to hold the dominant tenement entitled to the whole light that had previously been enjoyed, and V.C. Wood, in Dent *v.* Auction Mart Company (L.R. 2 Eq. 238), to a certain extent shared the same impression. There is not a hint in the judgment in Yates *v.* Jack which indicates that Lord Cranworth thought he was departing from the law as laid down in his earlier judgment. Both cases were decided and probably reported before Robson *v.* Whittingham, but the Lord Justices, as we have seen, adopted Clark *v.* Clark as an authority which had their approval. And, if the question at issue in Yates *v.* Jack be looked at, it will be seen that the argument to which Lord Cranworth's judgment was directed was that it was not necessary for the plaintiff to have the ordinary quantity of light because the business which they were carrying on required a diminished quantity only. That was the argument to which Lord Cranworth could not accede. So understood, and reading it by the light of Clark *v.* Clark, I do not dissent from the language used by Lord Cranworth *in*

* See our last issue, p. 501.

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Yates *v.* Jack:—"The right conferred by the statute is an absolute indefeasible right to the enjoyment of the light without reference to the purposes for which it has been used." Your Lordships were told, and my experience at the Bar confirms it, that the order made in Yates *v.* Jack has been adopted as a common form of order in cases of this description. I think this is unfortunate. It was a very proper order to make in that case, and in nineteen cases out of twenty, or perhaps ninety-nine out of one hundred, where no question arises such as that in the present case, it would be sufficient and appropriate. But it is an erroneous proceeding to deduce an absolute rule of law from the form of an order made in a particular case.

In Lanfranchi *v.* Mackenzie (L.R. 4 Eq. 421) V.C. Malins held that a person could not by using the dominant tenement for a period less than twenty years for some special purpose requiring an extraordinary amount of light in excess of what was required for the ordinary purposes of inhabitancy or business, entitle himself to protection for such extraordinary requirements, and thereby impose an additional restriction on his neighbour's use of his own land. In that case, as in the present one, it was not proved that the extraordinary amount of light had been used for twenty years. "No man," said the Vice-Chancellor, quoting the words of another Judge, "can by any act of his own suddenly impose a new restriction on his neighbour." In their judgment in Warren *v.* Brown (1902, 1 K.B. 15, at p. 24) the Court of Appeal dissented from this decision, and their opinion was a logical conclusion from the views which they expressed as to the nature and extent of the easement. My Lords, I do not concur with the opinion of the Court of Appeal, for I think that the case of Lanfranchi *v.* Mackenzie was rightly decided. I agree with the Vice-Chancellor that it would be contrary to the principles of the law relating to easements that the burden on the servient tenement should be increased or varied from time to time at the will of the owner of the dominant tenement. The easement is for access of light to the building, and if the building retains its substantial identity, or if the ancient lights retain their substantial identity, it does not seem to me to depend on the use which is made of the chambers in it, or to be varied by any alteration which may be made in the internal structure of it. I do not propose to discuss at length the question how far a variation in a tenement will destroy an easement appurtenant to it. The law on that subject is as old as Luttrell's case (4 Co. 86*a*).

In the case of Martin *v.* Goble (1 Camp. 320) a malthouse had been converted into a workhouse, and it was held that the house was entitled to the degree of light necessary for a malthouse, not for a dwelling-house. That case has been the subject of much criticism, and I think that some Judges have thought that the language of the Lord Chief Baron had a wider scope than it was intended to have. Following the suggestion of Vice-Chancellor Wood it may be supported on the ground that (to use the language of Luttrell's case) the alteration affected the substance and not only the quality of the tenement.

But while agreeing that a person does not lose his easement by any change in the internal structure of his building or the use to which it is put, and that regard may be had not only to the present use but also to any ordinary uses to which the tenement is adapted, I think it is quite another question whether he is entitled to be protected at the expense of his neighbour in the enjoyment of the light for some special or extraordinary purpose. It is agreed on all hands that a man does not lose or restrict his right to light by non-user of his ancient lights or by not using the full measure of light which the law permits. If that measure be by common law or by the statute the whole amount of light which has had access to his windows, *cadit quæstio*. But if this view of the law be not accepted, you must introduce that "supposed standard" which Lord Justice Romer repudiates. If the actual user is not the test where the use falls below the standard of what may reasonably be required for the ordinary uses of inhabitancy and business, why (it may be asked) should it be made a test where the use has been of a special or extraordinary character in excess of that standard. It does seem to me unreasonable to hold that where a man for his own convenience or profit converts two or more rooms of his house into one without making provision for lighting them, or converts a portion of his house into a photographic studio, or puts it to some similar purpose, he can suddenly call upon his neighbour to leave him a supply of light which is rendered necessary only by such alterations, and thereby impose what is in substance and in truth an increased burden on his neighbour. If the action be brought a month before the change it would be dismissed. If it be brought a month afterwards an injunction would be granted. I am of opinion that the Courts have gone too far in this question of lights, and have imposed undue restrictions on persons in the exercise of their lawful right to build on their own land.

In the second argument before your Lordships the leading counsel for the respondents contended that his clients had for more than twenty years enjoyed the access of light over the appellant's land to their ground floor office in its present condition. I believe that all your Lordships are agreed with Mr. Justice Joyce that there is no proof to support such a contention. The fact relied on was not put in issue at the trial, and the evidence was not directed to it. If the plaintiffs had intended to claim and rely on a special easement of that description, it was for them to state their claim and prove the facts to support it. It is unnecessary to say, therefore, whether such a claim would be good in law. Vice-Chancellor Malins thought it could be sustained if the special user was had with the knowledge of the owner of the previous tenement. I will only say that I see some difficulties in the way, and reserve my opinion.

My Lords, I must apologise for the length at which I have trespassed on your attention. According to both principle and authority, I am of opinion that the owner or occupier of the dominant tenement is entitled to the uninterrupted access through his ancient windows of a quantity of light, the measure of which is what is required for the ordinary purposes of inhabitancy or business of the tenement according to the ordinary notions of mankind, and that the question for what purpose he has thought fit to use that light, or the mode in which he finds it convenient to arrange the internal structure of his tenement, does not affect the question. The actual user will neither increase nor diminish the right. The single question in these cases is still what it was in the days of Lord Hardwicke and Lord Eldon, whether the obstruction complained of is a nuisance. I do not myself think that this rule is difficult of application in practice. In the majority of cases no such questions as those which have been raised in Warren *v.* Brown and the present case occur. The experience of surveyors who are practically conversant with this matter is entitled to great respect. As Mr. Vigers states in his evidence, they have adopted a working rule for the purpose of advising those who consult them and settling differences by negotiation. The rule of 45 degrees is not, of course, a rule of law, and is not applicable to every case. But I agree with Lord Selborne that it may properly be used as *primâ facie* evidence.

For these reasons I think that the appeal should be allowed, and the decree of Mr. Justice Joyce restored with costs here and below.

Lord Robertson concurred in the judgments that had been delivered.

Lord Lindley: My Lords.—Mr. Justice Joyce, who was asked to grant an injunction before the defendant's buildings had been erected, considered that although the buildings would sensibly diminish the plaintiffs' light, the diminution would not materially affect his comfort or convenience, and would not be sufficient to entitle the plaintiffs to any relief, and he dismissed their action. The Court of Appeal, however, took a different view, and granted a mandatory injunction ordering the defendant to pull down part of his building, which had been completed after the injunction had been refused. Hence the appeal to your Lordships.

The language of section 3 of the Prescription, Act 2 and 3 Will. 4, c. 71, shows that in order to acquire a right to light there must be:—

1. Access and use of light, not access alone. Access here is understood to refer to free passage of light over the servient tenement; see per Fry, L.J., in 31 Ch. D. s. 75, and per Kay, J., in 40 Ch. D. 26.

2. Such access and use must be to and for some dwelling-house, workshop, or other building (as to which see Harris *v.* De Pinna, 33 Ch. D. 238).

3. Such access and use must be actually enjoyed therewith.

4. Such enjoyment must be without interruption for twenty years.

5. If all these are proved, the right to the access and use of light so enjoyed becomes absolute and indefeasible, unless it can be explained by some deed or writing.

Pausing here for a moment, it will be observed that the statute does not in terms confer a right to light, but rather assumes its acquisition by use and enjoyment, and declares it to be "absolute and indefeasible."

Again, your Lordships will observe that nothing is said about enjoyment as of right; and notwithstanding section 5 of the Act, which refers to enjoyment as of right, it was early decided that as regards light claimed under section 3 enjoyment as of right need not be alleged or proved; and that the right, whatever it may be, is acquired by twenty years' use and enjoyment without interruption and without written consent. See Truscott *v.* Merchant Taylors Company, 11 Ex., 855, and Frewen *v.* Phillips, 11 C.B., N.S. 449; Simper *v.* Foley, 2 J. and H. 555, and Harbidge *v.* Warwick, 3 Ex. 557. This was not so under the old law.

As regards use and enjoyment there are some instructive decisions on unfinished and uninhabited houses, and on windows kept closed by shutters. These decisions show that a right to light may be acquired in respect of a house which has stood for twenty years without being occupied or even finished so as to be fit for occupation; and that the fact that shutters have been closed for some months at a time does not prevent the acquisition of a right to light through the windows. See Courtald *v.* Legh, L.R. 4, Ex. 126; Cooper *v.* Straker, 40 Ch. D. 21; Collis *v.* Laugher, 1894, 3 Ch. 659; Smith *v.* Baxter, 1900, 2 Ch. 143.

These decisions did not, however, turn upon or settle with any precision the amount of light to which a right is acquired by twenty years' user. Nor is the statute clear upon this point. At one time it appears to have been considered that in all cases the size and situation of the aperture through which light had come for twenty years formed both the maximum and minimum measures of the right acquired, without reference to the use and enjoyment of the light which had so come. This view was based on some observations made by Lord Westbury in Tapling *v.* Jones, 11 H.L. 305-6, and on Lord Cranworth's judgment in Yates *v.* Jack, 1 Ch. 295, which I will notice presently. Lord Chelmsford took the same view in Calcraft *v.* Thompson, 15 W.R. 387.

But this view was emphatically negatived by the Court of Appeal in Chancery in Kelk *v.* Pearson, 6 Ch. 809; The City of London Brewery Company *v.* Tennant, 9 Ch. 212, and Leech *v.* Seveder, 9 Ch. 463. In Moore *v.* Hall, 3 Q.B.D. 178, however, both Mellor and Manisty, JJ., adopted the interpretation thus repudiated, but it does not appear that this were aware of the repudiation.

Kelk *v.* Pearson shows that in ordinary cases a person does not necessarily acquire a right to all the light he has had for twenty years. He may have had more than he reasonably required either for domestic or business purposes; and in that case his right is limited to the amount of light reasonably required.

There can be no doubt that Lord Cranworth's language in Yates *v.* Jack, and the headnote to it, and the form of injunction granted, have been regarded as authorities for the view that in all cases the statute confers a right to all the light which has come to a window for twenty years; and there are passages in the judgments of Cotton and Bowen, L.JJ., in Scott *v.* Pape, 31 Ch. D. 554, which support the same view. This is to be regretted as it has tended to unsettle the rule laid down in Kelk *v.* Pearson. The decision in Yates *v.* Jack did not, however, really go so far as has been supposed, for the plaintiff's windows were darkened to such an extent as to render the plaintiff's house much less convenient for purposes of business than it was before. The case did not turn on the mere fact that some diminution of light was proved. The plaintiff's right to light was clearly infringed, whether the measure of the light to which he was entitled was all that had come through his windows or only so much as was reasonably necessary for business purposes. If these facts are borne in mind, nothing will be found in the actual decision which conflicts with the views previously expressed by Lord Cranworth in Clark *v.* Clark, 1 Ch. 16, and adopted by the Court of Appeal in the cases already mentioned.

The common form of injunction in these cases is that adopted in Yates *v.* Jack (L.R., 1 Ch. 295) and Dent *v.* Auction Mart Company (L.R., 2 Eq., at p. 255). It is to restrain the defendants from erecting any building so as to obstruct the free access of light to the ancient windows of the plaintiff, as such access was enjoyed previously to the taking down of the house which formerly stood on the site of the defendants' new buildings.

This form is framed upon the supposition that the plaintiff has established his right to the amount of light which he in fact enjoyed before the obstruction complained of. But it by no means follows from the form that everyone is entitled to an injunction who can prove that he has been deprived of some of the light which he in fact had before it was interfered with. He may have had more than he can acquire a right to use and enjoy in future. I am, however, under the impression that this

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inference has been drawn and that the form has been regarded as strengthening the view of the law repudiated in Kelk *v.* Pearson.

So to regard the form is, in my opinion, a mistake. The doctrine laid down in Back *v.* Stacey (2 Car. and P. 465), as I understand it, is the same as that laid down, although in somewhat different language, by the Court of Appeal in Kelk *v.* Pearson (6 Ch. 809) and the City of London Brewery Company *v.* Tennant (9 Ch. 212), and must, I think, be taken as finally established and as good, sound law which your Lordships should adopt, notwithstanding the observations in the Irish case of Mackay *v.* Scottish Widows' Company (Ir. Rep. 11 Eq. 541). That doctrine, as stated in the City of London Brewery Company *v.* Tennant, is that, generally speaking, an owner of ancient lights is entitled to sufficient light according to the ordinary notions of mankind for the comfortable use and enjoyment of his house as a dwelling-house, if it is a dwelling-house, or for the beneficial use and occupation of the house if it is a warehouse, a shop, or other place of business (see 9 Ch. 216. 7). The expressions "the ordinary notions of mankind," "comfortable use and enjoyment," and "beneficial use and occupation," introduce elements of uncertainty; but similar uncertainty has always existed and exists still in all cases of nuisance, and in this country an obstruction of light has commonly been regarded as a nuisance, although the right to light has been regarded as a peculiar kind of easement.

If a more absolute standard had been adopted in all cases certainty would, no doubt, have been gained; but the consequences would frequently have been very oppressive on the owner of the servient tenement, and far more so than under the old law. The owner of the servient tenement could have done nothing on his own land which, in fact, diminished the light acquired by his neighbour, even if all of it was not wanted for comfortable enjoyment or business purposes. It would follow that the owner of a piece of vacant land opposite to a house in an ordinary street could not build upon it at all after twenty years. The adherence to the old but uncertain standard of comfort and convenience avoids the danger of oppression and extortion, and renders it necessary to take a wider view of each case, especially when an injunction is asked for.

The decision in Kelk *v.* Pearson has a far-reaching effect. If there is no absolute right to all the light which comes to a given window no action will lie for an obstruction to that light unless the obstruction amounts to a nuisance. If there is no right of action *à fortiori*, there is no right to an injunction to prevent a permanent diminution of light unless it amounts to a nuisance. But in considering what is an actionable nuisance, regard is had not to special circumstances which cause something to be an annoyance to a particular person, but to the habits and requirements of ordinary people, and it is by no means to be taken for granted that a person who wants an extraordinary amount of light for a particular business can maintain an action for a diminution of light if only his special requirements are interfered with. See, as to nuisances to persons carrying on delicate trades or requiring more comfort or freedom from annoyance than ordinary people, Walter *v.* Selfe, 4 De G. and Sm. 322; Crump *v.* Lambert, L.R. 3 Eq. 409; and The Eastern and South African Tel. Company *v.* The Cape Town Tramways Company, 1902, A.C., at p. 393, and as to the character of the neighbourhood, see St. Helens Smelting Company *v.* Tipping, 11 H.L. 642.

The expression "right to light" is sanctioned by the Prescription Act, and is convenient; but its use is apt to lead to error and to forgetfulness of the burden thrown on the servient tenement. This burden, however, ought never to be lost sight of in considering the extent of the right claimed in respect of the dominant tenement.

But the adoption of the more flexible standard of comfort and convenience has introduced difficulties of a serious nature, especially when dealing with places of business, and it is not surprising that different views on this subject should have been taken, and that the decisions upon it should be inconsistent with each other. That they are inconsistent is apparent from the careful review of them by Mr. J. Wright in Warren *v.* Brown, 1900, 2 Q.B. 722.

In applying the rule laid down in Kelk *v.* Pearson it is impossible to avoid considering how much light is left and where it comes from. But the question to be decided is not how much light is left, but whether he has been deprived of so much as to constitute an actionable nuisance. If he has, it is no defence to say that he has as much light left as most other people. See Dent *v.* Auction Mart Company, 2 Eq. 250, 251. Too much weight may have been given by Mr. Justice Wright to the amount of light left in Warren *v.* Brown, 1900, 2 Q.B. 722, and this explains the reversal of his decision by the Court of Appeal.

There is no rule of law that if a person has 45 degrees of unobstructed light through a particular window left to him he cannot maintain an action for a nuisance caused by diminishing the light which formerly came through that window: Theed *v.* Debenham, 2 Ch. D. 165. But experience shows that it is, generally speaking, a fair working rule to consider that no substantial injury is done to him where an angle of 45 degrees is left to him, especially if there is good light from other directions as well. The late Lord Justice Cotton pointed this out in The Ecclesiastical Commissioners v. Kino, 14 C.H. 228; see also Parker *v.* First Avenue Hotel Company, 24 Ch. D. 282.

As regards light from other quarters, such light cannot be disregarded; for, as pointed out by V.C. James in the Dyers' Company *v.* King, 9 Eq. 438, the light from other quarters, and the light, the obstruction of which is complained of, may be so much in excess of what is protected by law as to render the interference complained of non-actionable. I apprehend, however, that light to which a right has not been acquired by grant or prescription, and of which the plaintiff may be deprived at any time, ought not be taken into account. (See the case just cited.)

The purpose for which a person may desire to use a particular room or building in future does not either enlarge or diminish the easement which he has acquired. If he chooses in future to use a well-lighted room or building for a lumber room for which little light is required he does not lose his right to use the same room or building for some other purpose for which more light is required. Aynsley *v.* Glover, 8 Eq. 548, and 10 Ch. 283, is in accordance with this view. But if a room or building has been so built as to be badly lighted, the owner or occupier cannot by enlarging the windows or altering the purpose for which he uses it increase the burden on the servient tenement. Martin *v.* Goble, 1 Camp. 380, where a malthouse was turned into a workhouse, may, I think, be upheld on this principle, and the observations of V.C. Wood on Martin *v.* Goble, in Dent *v.* Auction Mart Company, 2 Eq. 238, support this view. There was, in fact, no substantial interference with the light to which they were entitled.

Coming now to the present case, I am clearly of opinion that no injunction, and certainly no mandatory injunction, ought to have been granted. Mr. J. Joyce was asked for an injunction and he refused it, and, in my opinion, quite rightly. He came to the conclusion that although there would be a sensible diminution of light and some inconvenience to the plaintiffs, yet they had not established by twenty years' user a right to all the light which they had had, and that the obstruction complained of would not amount to an actionable nuisance, and so infringe the plaintiffs' right. The Court of Appeal, taking a different view of the amount of light to which the plaintiffs were entitled, reversed this decision, and ordered a partial demolition of the buildings erected by the defendants. For the reasons already given, I have come to the conclusion that this was wrong.

I should stop here were it not that I feel very strongly that in any view of the case it was one for a mandatory injunction. I am convinced that even if the plaintiffs have a cause of action, the damages which could properly be awarded them would be very small, and to grant a mandatory injunction in such a case as this would be unduly oppressive and not in accordance with the principles on which equitable relief has been usually granted. See the Curriers' Company *v.* Corbet, 2 Dr. and Sm. 355; Robson *v.* Whittingham, 1 Ch. 442; and The National Provincial Place Glass Company, 6 Ch. D. 757, at p. 761, in all of which an injunction was refused, although the plaintiff's legal right had been infringed. In Warren *v.* Brown the Court of Appeal only give damages. The present case is eminently one in which damages would be an adequate remedy, even assuming the plaintiffs could prove a small nuisance for which some damages could be properly given; and where that is the case an injunction, and especially a mandatory injunction, ought not to issue. The doctrine that where a legal right is continuously infringed an injunction to protect it ought to be granted is subject to qualification, as was carefully explained by Sir George Jessel in Aynsley *v.* Glover, 18 Eq. 551, *et seq.*, and more recently by the Court of Appeal in Shelfer *v.* City of London Electric Lighting Company, 1895, 1 Ch., pp. 310, 314-316, and 322.

My Lords, the result of the foregoing review of the authorities is not altogether satisfactory. The general principle deducible from them appears to be that the right to light is, in truth, no more than a right to be protected against a particular form of nuisance, and that an action for obstruction of light which has, in fact, been used and enjoyed for twenty years without interruption or written consent cannot be sustained unless the obstruction amounts to an actionable nuisance, and this often depends upon considerations wider than facts applicable to the complainant himself. There are elements of uncertainty which render it impossible to lay down any definite rule applicable to all cases. First, there is the uncertainty as to what amount of obstruction constitutes an actionable nuisance; and, secondly, there is the uncertainty as to whether the proper remedy is an injunction or damages. But notwithstanding these elements of uncertainty the good sense of judges and juries may be relied upon for adequately protecting rights to light on the one hand and freedom from unnecessary burdens on the other. There must be consideration for both sides in all these controversies. In this case the Court of Appeal have, in my opinion, gone too far, and the appeal ought to be allowed with costs here and below.

[The appeal, as reported in our last issue, was accordingly dismissed with costs.]

WIMBLEDON BUILDING ESTATE DISPUTE.

THE case of the Attorney-General *v.* The Wimbledon House Estate Company, Ltd., came before Mr. Justice Farwell in the Chancery Division on the 5th inst.—an action by the Attorney-General at the relation of the Urban District Council of Wimbledon for a mandatory injunction to restrain defendants from building a house in Parkside-gardens, Wimbledon, contrary to the provisions of the Public Health (Buildings in Streets) Act, 1888.

Mr. Danckwerts, K.C., and Mr. R. J. Parker appeared for the plaintiff, and Mr. W. H. Upjohn, K.C., and Mr. Horne for the defendants.

It appeared that about the middle of 1903 the defendants, who were developing a building estate at Wimbledon, submitted to the Council plans and sections of a house they proposed to erect on the east side of Parkside-gardens, and their contractors commenced work on August 31. The Council's surveyor, on September 8, asked defendants to make certain amendments in the deposited plans so as to comply with the Council's by-laws, and defendants, on September 14, made the required amendments. On September 23, the Council disapproved of the plans, and notice of disapproval was sent the following day, the ground stated being that the plans were not in accordance with the by-laws. It was admitted this was a mistake, but on September 28 the defendants' architects were told by the deputy-surveyor to the Council that the reason for the disapproval of the plans was that the front main wall of the billiard room would project 6 ft. 3 in. beyond the line of the main front wall of the adjoining house, contrary to the provisions of section 3 of the Public Health (Buildings in Streets) Act, 1888. At this time the walls of the billiard room had been erected to a considerable height. The Council, on November 18, gave defendants notice that they were offending against the Act, and that they were liable to a penalty of 40s. for every day during which the offence continued after notice. The Council, on November 23, took out a summons against defendants, and the Justices imposed a penalty of 20*l.* and costs, which were paid. The Attorney-General now alleged that since the conviction the defendants had continued, and threatened to continue, and intended to complete the house contrary to the provisions of the Act, and he claimed a mandatory injunction for the pulling down of so much of the house as infringed the third section of the Act. On behalf of the Attorney-General, it was argued that, as the offence was a continuing offence, the Attorney-General could take action in the interests of the public. On behalf of the defendants it was contended that where there were two remedies both could not be pursued. It was also contended that the Council had been guilty of *laches*, and that, in the circumstances of the case, the court ought not to grant a mandatory order.

In the result, his lordship, in giving judgment, said it was not disputed that the billiard room in question did go beyond the front main wall of the house on the side of it. The defendants appeared to take the point that as they had already been punished by the magistrates they could not now be attacked by the Attorney-General. That, however, was a misapprehension. The penalty was one that could be imposed and imposed again and again from time to time so long as the offence continued. He saw no reason why the Attorney-General should not be heard to say that he would appeal to the Court and make the defendants

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pull down the offending structures. The other point taken by the defendants was *laches*, but delay could not be charged as against the Attorney-General. There had been a bold determination by the defendants to go on their own way. He could not say that the Attorney-General ought not to have initiated the litigation, and, therefore, he could not say that he was not right in asking for a mandatory injunction, which he granted accordingly.

A stay of execution for a month was granted with the view to an appeal.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

8,963 of 1903.—A. T. SPENCE, J. H. PRUGH, and S. B. ZIMMER: *Machine for Surfacing or Cleaning and Grinding or Polishing Floors of Wood and other materials.*

A floor surfacer or dresser, consisting of surfacing rolls, means for revolving said rolls upon their axes, means for manually adjusting said rolls to engage or clear the floor, and means for moving said rolls forward or back along the floors to be operated upon.

10,078 of 1903.—J. CHALLIS: *Advertisement Glass Tablets.*

An advertisement tablet, consisting of a plate of glass, which is bent or dished, to cause a central part of the plate on which the advertisement is applied to assume a convex or concave oval surface, the back of the said part of the plate being silvered.

12,873 of 1903.—W. J. PECKETT: *Door Knockers.*

This consists in the combination with a door knocker of mechanism whereby a mechanical bell, gong, or the like may be sounded, or an electric circuit completed, for ringing an electric bell, when the knocker is manipulated by knocking at a door.

13,177 of 1903.—SUTCLIFFE, SPEAKMAN, and Co., LTD., and T. DAWBER: *Clay-working Machinery.*

An apparatus for the treatment of clay, consisting in the combination with a mixing mill of a pug mill or chamber provided with a pugging screw, and having an outlet partially closed by a grid or grating, and a revolving knife, secured to the mixer shaft immediately outside the partially-closed outlet.

13,328 of 1903.—G. WHITEHOUSE, LTD., F. H. TUFT, and H. TURNER: *Band Hinges.*

According to this invention, the rear end of the band or strap is formed, as is usual with this class of hinge, with an eye to receive a hinge pin. Each mounting of a pair between which a band or strap is carried is formed with a flat surface to bed against the post and with holes to receive screws, by which it is fixed thereto, and with an outward projection or lug, from which projects a stud or pin, which is formed in one piece of metal with the rest of the mounting. The studs or pins of a pair of these mountings together form the hinge pin upon which the band turns. One of them passing upwards within the eye and the other downwards, and the two preferably just about meeting together at the middle of the eye. It will be seen, however, that mountings of one size may be used for hinges having bands of varying widths, as it is not essential that the studs or pins of the mountings shall meet at the middle of an eye.

14,554 of 1903.—H. TERRISSE: *Treatment of Gums and Resins, and the Preparation of Varnishes.*

A method of dissolving hard and semi-hard resins in siccative oils, consisting in first dissolving the resin in phenol, or a mixture of phenol and cresol, at a temperature between 250 degrees and 290 degrees C., then adding to the solution linseed oil and eliminating the phenol by distillation.

15,347 of 1903.—J. PLACE and SONS, LTD., and W. H. PLACE: *Waste Water-closets, and the like.*

This invention consists in an improved basin for waste water-closets, and the like. According to the improvements, the outlet from the basin is placed at the extreme back thereof, that is to say, the rear wall of the basin drops perpendicularly to the bottom of the outlet, of which it forms the back. By this means a very efficient flush is obtained, as the rush of water from the tipper, after impinging against the back of the basin, drops straight down the outlet, and consequently falls with more momentum than when its course is more or less circuitous. To prevent any soiling of the basin in front of the outlet, a channel is provided in the basin, in that position, for holding the water.

23,778 of 1903.—O. M. EDWARDS: *Windows.*

A window, consisting in the combination of a guide way, a sash, adapted to move in the guide way, a holding device, pivotally mounted on the window frame adjacent to the guide way, and to bear upon one portion of the sash, and also to engage with the movable part of another device, a second holding device mounted upon the sash, and provided with a movable part, adapted to engage with a portion of the pivotally-mounted device, and to bring pressure against the sash, and at the same time cause both devices to increase their holding action upon the sash at different points thereon, as such movable part is moved in one direction.

3,250 of 1904.—F. SCHUMANN: *Slide Ways for Saving Persons and Goods from the Upper Stories of Burning Buildings.*

Slide ways for saving persons and goods from the stories of burning buildings, the distinguishing feature being the arrangement of telescoping sections of U-shaped cross-section on a carriage, to the first of which sections a rope for drawing up the slide way is fixed on a raised ladder in connexion therewith, the different sections, as they are drawn out from one another, are firmly joined together by the snapping of a spring-bolt in the groove of each part, and a firm slide way is thus formed on the ladder.

3,594 of 1904.—J. H. KIRK: *Enamelled Metal Tablets or Plates for Facing Walls, Ceilings, and the like.*

In carrying out this invention, metal blanks of square, oblong, rhombic, rhomboidal, or other suitable shape are provided according to the pattern to be produced by the tablets, and two or more of the edges of each tablet are bent so as to form semi-circular flanges, which, when the tiles are placed upon a bed of mortar, cement, or other fixing material, form keys to prevent the tablets from becoming detached.

4,276 of 1904.—J. M. TOUTEL: *Cowls and Ventilators.*

A cowl or ventilator, consisting of a pipe, tapering to a less diameter at its upper end, said pipe having a spherical or other suitably-shaped body surrounding the higher end of the pipe, and being provided with openings having upward sloping plates for directing the air blowing against them in an upward direction, a hole in the upper part of the sphere permitting the smoke and air to pass out, said opening having a suitable cap or cover mounted above it.

4,392 of 1904.—F. FOUCHE: *Apparatus for Heating and Cooling.*

An apparatus for heating and cooling, consisting in the method of assembling corrugated or non-corrugated hollow plates in straight lines, coiled or sinuous paths, in parallel or in series, so as to cover surfaces of large extent.

5,985 of 1904.—K. N. FRYDENLUND: *Method of Manufacturing Tiles or other Glazed Articles from Slate or Slate Refuse.*

A method of preparing plates, tiles, or the like from slate or slate residue, consisting in moistening the pulverised slate with a liquid prepared by warming together with sodium hydrate, colophony, and water, and subsequently adding a dilute sodium silicate solution thereto, in subjecting the mass to a comparatively small pressure to mould the same into plates or tiles, and in drying the pressed articles first at ordinary temperature, then at a temperature of from 60 degrees to 100 degrees C.

6,007 of 1904.—V. STEGER: *Manufacture of Artificial Stone, Blocks, or Bricks.*

A method of making artificial bricks, which consists in mixing ninety-three parts of sand and seven parts of lime, then adding a solution of carbonate of soda and water in proportion of eight pounds of the soda to 100 gallons of water, then forming the mixture into bricks or the like, then subjecting the article to the action of steam for ten hours, more or less, the steam being previously brought into contact with a mixture of caustic potash and flower of sulphur.

17,627 of 1903.—S. VIGERS: *Detachable or Removable Parquetry.*

This relates to detachable or removable parquetry, composed of a large number of small pieces, having the grain reversed, the pieces being glued or fastened together upon thin sheets on a backing of cloth, canvas, veneer, and finished and polished ready for laying.

10,702 of 1903.—R. D. LAMPSON: *Electric Advertising Devices and Street Indicators.*

A device, comprising a casing provided with a sight opening, rollers mounted in said casing above and below such opening, a strip secured at the ends to said rollers, and provided with a perforated metal backing, and on its outer surface with objects to be displayed, a shaft carrying toothed wheels engaging said perforations, and a motor geared to said shaft for intermittently rotating said toothed wheels to bring such objects successively before the sight opening.

20,971 of 1903.—W. H. BAXTER: *Machinery or Apparatus for Elevating, Screening, and Loading Broken or Crushed Stone, Ore Refuse Clinker, and the like, or other Materials.*

The construction of elevating and screening mechanism upon a system by which the material under treatment is raised by an elevator driven from the top and divided into sections, the division being so arranged as to permit the removal of rejected material at an early stage in the operation of the machine, thereby minimising the power required to drive the machine and the wear and tear incidental to working it.

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 25.—By WILKINSON, SON, & WELCH (at Brighton).

Brighton, Sussex.—18, Bedford-sq., f., y.r. 70*l.*	£850
5, West Hill-st., f., w.r. 32*l.* 10s.	415
14, Hampton-pl., f., y.r. 50*l.*	700
Hampton-st., freehold stabling, y.r. 10*l.*	150
5, Hampton-st. (workshops, stores, and yard), f., y.r. 30*l.*	305

April 28.—By STEVENSON & ALEXANDER (at Cardiff).

Ely, Glamorgan.—Ely Moors, two closes of pasture land, 6 a. 3 r. 18 p., f.	1,490

April 29.—By W. DEW & SON (at Conway).

Caerhun, etc., Carnarvon. — "The Gorswen Estate," 592 a. 3 r. 32 p. (in nine lots)	12,191

May 2.—By DEBENHAM, TEWSON, & Co.

Whitechapel.—Duncan-st., f.g.r. 240*l.*, reversion in 71 yrs.	4,800
2, Commercial-st. (s.), f., y.r. 65*l.*	1,400
Hackney.—Well-st., f.g.r. 49*l.*, reversion in 53 yrs.	1,270
159, 161, 163, and 165, Well-st. (s.), f., y.r. 181*l.*	2,695

By KEMSLEYS'.

Homerton.—57 to 67 (odd), Berger-rd., f., w.r. 135*l.* 4s.	1,350
Barnsbury.—Bride-st. ("White Swan" b.h., etc.), f.g.r. 9*l.* 9s., reversion in 11½ yrs.	1,270
Hornsey.—Westfield-rd., f.g.r. 6*l.*, reversion in 63½ yrs.	150
Islington.—62 and 70, Oxford-rd., u.t. 48½ yrs., g.r. 16*l.*, y.r. 82*l.*	735
East Ham.—1 to 20, Fabian-st., f., w.r. 276*l.* 18s.	1,810

By J. W. NEIGHBOUR.

City-road.—5, Coomb-st., u.t. 20 yrs., g.r. 5*l.* 10s., e.r. 36*l.*	190

By JAMES HARRIS & SON (at Fareham).

Hambledon, Hants.—"Apless Farm," 36 a. 3 r. 7 p., f.	1,450
Three freehold pastures, 10 a. 3 r. 26 p.	370

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, MAY 13.

Architectural Association.—Members' Dinner, Criterion Restaurant, Piccadilly Circus. 7 p.m.

Royal Institution.—Mr. M. H. Spielmann, F.S.A., on "The Queen Victoria Memorial." 9 p.m.

SATURDAY, MAY 14.

Architectural Association.—First Summer Visit—to Moor Park, Rickmansworth.

Incorporated Association of Municipal and County Engineers.—Yorkshire District Meeting, York.

British Institute of Certified Carpenters.—Visit to St. Paul's. 2.45 p.m.

St. Paul's Ecclesiological Society.—Visit to Lambeth Palace, under the guidance of Mr. S. W. Kershaw, F.S.A.

Institute of Sanitary Engineers, Ltd.—Visit to Messrs. John I. Thornycroft & Co.'s Works, Chiswick. Members to assemble at the Old Chiswick Church, The Mall, at 10.45 a.m. In the afternoon the members will visit the power station, London Tramways Depôt, Chiswick, and will assemble at the main entrance at 2.30 p.m.

London Topographical Society (Hall of Staple Inn, Holborn).—Mr. T. Cato Worsfold on "The Fayrest Innes of Chancerie." 3.15 p.m.

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MONDAY, MAY 16.

Royal Institute of British Architects.—The Rev. J. B. Lock, M.A., on "The Planning of Collegiate Buildings." 8 p.m.

Surveyors' Institution.—Discussion on the paper read by Mr. Thomas Blashill at the meeting of April 18, entitled "London Streets and Street Traffic." 8 p.m.

TUESDAY, MAY 17.

Royal Institution.—Mr. L. Fletcher, M.A., F.R.S., on "Meteorites." III. 5 p.m.

Society of Arts (Applied Art Section).—Mr. Lasenby Liberty on "Pewter and the Revival of its Use." 8 p.m.

Royal Victoria Hall, Waterloo-road, S.E.—Mr. H. Birdwood on "Iron and Steel under the Microscope."

Edinburgh Architectural Association (Associates' Section).—Visit to Melrose and Darnick Tower.

WEDNESDAY, MAY 18.

British Archæological Association.—(1) Paper by Mr. C. H. Compton, entitled "Can Votive Offerings be Treasure Trove?"; (2) Mr. R. H. Forster, M.A., on "Durham and the Rights of Sanctuary." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the members. 8 p.m.

Institute of Sanitary Engineers, Ltd.—Election Committee, 3.0 p.m. General Purposes and Finance Committee, 5.0. Council Meeting, 7.0.

THURSDAY, MAY 19.

Institution of Electrical Engineers (at the Society of Arts).—Discussion on Messrs. Parsons, Stoney, and Martin's paper, entitled "The Steam Turbine as Applied to Electrical Engineering." 8 p.m.

FRIDAY, MAY 20.

Royal Institution.—Professor E. Rutherford, M.A., on "The Radiation and Emanation of Radium. 9 p.m.

Junior Institution of Engineers (Westminster Palace Hotel).—Paper entitled "Practical Notes on the Running of Motor Cars and Cycles," by Lieut. W. G. Windham, R.N. 8 p.m.

Incorporated Association of Municipal and County Engineers.—Midland District Meeting, Buxton.

SATURDAY, MAY 21.

Edinburgh Architectural Association.—Visit to Fordell Castle and Old Garden.

Incorporated Association of Municipal and County Engineers.—Midland District Meeting. Concluded.

TO CORRESPONDENTS.

D. & M.—(Amount should have been stated). E. W. (Names and amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

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*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" at railway depôt.
Red Wire Cuts	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "

BRICKS, &c.—(*Continued*).

	£ s. d.	
Two Sides and one End	15 0 0	per 1000 at railway depot. " " "
Splays, Chamferred, Squints	14 0 0	" "
Second Quality, White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	30 0	per ton, "
Best Ground Blue Lias Lime	21 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality*

	s. d.	
Scappled random blocks	2 10	per ft. cube. "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "

HARD YORK—

Scappled random blocks	3 0	per ft. cube, "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides (slabs random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
" " " 6 in. sawn both sides landings	2 7	deld. rly. depôt per ft. super. deld. rly. depôt
" " " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 first quality "	13 0 0	" "
20 × 12 " " "	13 15 0	" "
16 × 8 " " "	7 5 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 best blue Portmadoc	6 12 6	" "
20 × 10 best Eureka unfading green	15 17 6	" "
20 × 12 " "	18 7 6	" "
18 × 10 " "	13 5 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 12 6	" "
18 × 10 " "	9 12 6	" "
16 × 8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. " "
Best Brosely tiles	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " "
Hip and Valley tiles	4 0	per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 " "
Do. Ornamental do	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced	50 0	per 1000 " "
Do. pressed	47 6	" " "
Do. Ornamental do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.

WOOD.—(*continued*).

	At per standard. £ s. d.	£ s. d.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards—1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
⅔ in.	1 0 0	"

	At per load of 50 ft. £ s. d.	£ s. d.
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOINERS' WOOD.

	At per standard. £ s. d.	£ s. d.
White Sea: first yellow deals, 3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks—per ft. cube	0 4 0	—

	Per square.	
Prepared Flooring—1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
in. by 7 in. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	... 7 5 0
Compound Girders, ordinary sections	8 2 6	... 9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	... 8 17 6
Flitch Plates	8 5 0	... 8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6	... 8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 5 0	... 7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0	... 8 5 0
Staffordshire "Marked Bars"	10 0 0	... —
Mild Steel Bars	8 15 0	... 9 5 0
Hoop Iron, basis price	9 5 0	... 9 10 0
" " Galvanized	17 10 0	... —

(*And upwards, according to size and gauge.)

Sheet Iron (Black)—Ordinary sizes to 20 g.	9 15 0	... —
" " 24 g.	10 15 0	... —
" " 26 g.	12 5 0	... —
Sheet Iron, Galvanised, flat, ordinary quality—Ordinary sizes—6 ft. by 2 ft. to 8 ft. to 20 g.	12 15 0	... —
Ordinary sizes to 22 g. and 24 g.	13 5 0	... —
" " 26 g.	14 5 0	... —
Sheet Iron, Galvanised, flat, best quality—Ordinary sizes to 20 g.	16 0 0	... —
" " 22 g. and 24 g.	16 10 0	... —
" " 26 g.	18 0 0	... —
Galvanised Corrugated Sheets—Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0	... —
" " 22 g. and 24 g.	13 0 0	... —
" " 26 g.	13 15 0	... —

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METALS—*Continued.*

	Per ton, in London. £ s. d.	£ s. d.
Best Soft Steel Sheets, 6 ft. by 2 ft.	£ s. d.	£ s. d.
to 3 ft. by 20 g. and thicker	11 15 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0 ...	—
,, ,, ,, 26 g.	14 0 0 ...	—
Cut nails, 3 in. to 6 in.	9 0 0 ...	9 10 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 12 6 ...	—
Pipe in coils	15 2 6 ...	—
Soil pipe	17 12 6 ...	—
Compo pipe	17 12 6 ...	—
ZINC—Sheet—		
Vieille Montagne ....ton	27 5 0 ...	—
Silesian	27 0 0 ...	—
COPPER—		
Strong Sheet....per lb.	0 0 10½ ...	—
Thin ,, ... ,,	0 0 11½ ...	—
Copper nails .... ,,	0 0 11 ...	—
BRASS—		
Strong Sheet.... ,,	0 0 10 ...	—
Thin ,, ... ,,	0 0 11 ...	—
TIN—English Ingots .... ,,	0 1 4 ...	—
SOLDER—Plumbers' .... ,,	0 0 6½ ...	—
Tinmen's .... ,,	0 0 8 ...	—
Blowpipe .... ,,	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d. per ft. delivered.
,, fourths	1½d. ,, ,,
21 oz. thirds	3d. ,, ,,
,, fourths	2½d. ,, ,,
26 oz. thirds	3½d. ,, ,,
,, fourths	3d. ,, ,,
32 oz. thirds	4½d. ,, ,,
,, fourths	4d. ,, ,,
Fluted Sheet, 15 oz.	2½d. ,, ,,
,, 21 oz.	3½d. ,, ,,
⅛ Hartley's Rolled Plate	1¾d. ,, ,,
¼ ,, ,, ,,	1¾d. ,, ,,
½ ,, ,, ,,	2¾d. ,, ,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes or barrels . per gallon	0 1 5
,, ,, ,, in drums ,,	0 1 8
Boiled ,, ,, in pipes or barrels . ,,	0 1 8
,, ,, ,, in drums ,,	0 1 11
Turpentine, in barrels ,,	0 3 7
,, in drums ,,	0 3 9
Genuine Ground English White Lead per ton	19 0 0
Red Lead, Dry ,,	19 0 0
Best Linseed Oil Putty per cwt.	0 6 6
Stockholm Tar per barrel	1 12 0

VARNISHES, &c. Per gallon.

	£ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BARNARD CASTLE.—For erecting a villa residence, Park-terrace, for Mr. F. W. Raper. Mr. F. Farrow, architect, 7, Market-place, Barnard Castle. Quantities by architect:—

Bricklayer and Mason: J. Kyle & Sons, Barnard Castle*	Total accepted Tenders about £1,000.
Carpenter and Joiner: T. Borrowdale & Son, Barnard Castle*	
Plumber and Glazier: C. E. Raine, Barnard Castle*	
Painter: J. W. Jackson, Barnard Castle*; C. W. Stockdale, Barnard Castle; R. Wilson, Barnard Castle	
Plasterer: F. Welford, Barnard Castle*; R. Brotherton, Barnard Castle	
Tiler: J. Lancaster, Barnard Castle*; C. Martin, York	
G. P. Robinson, Lartington, Barnard Castle	
E. Thompson, Bishop Auckland	
J. & R. Mascall, Bishop Auckland	

BECCLES.—For the erection of a water tower, Ringfield Pumping Station, for the Directors of the Waterworks Company. Mr. Ernest A. Brine, engineer:—

Hipperson Bros.	£239 0 0	C. C. Betts	£194 0 0
J. E. Pestell	220 0 0	H. A. King,	
Youngs & Son	195 0 0	Beccles*	181 15 0

BEXHILL (Sussex).—For 1,250 tons of quartzite macadam, for the Corporation. Mr. G. Ball, Borough Surveyor:—

	At per ton.
C. G. German, Portsmouth	£0 12 6
Road Maintenance & Supply Co., Gravesend*	0 12 6
Quartzite Co.	0 11 7

BEXHILL.—For constructing an 18-in. pipe intercepting sewer in Dorset-road, for the Corporation. Mr. G. Ball, Borough Surveyor, Town Hall:—

M. Hookham	£2,739 0 0	J. Jackson	£1,571 17 11
J. Kine	2,178 5 6	S. Carey	1,565 0 0
A. C. Soan	1,972 8 0	Peerless, Dennis, & Co., Eastbourne*	1,187 0 0
F. Adams	1,781 0 0		
G. C. Rayner	1,631 8 0		
G. Shoesmith	1,577 17 10		

[Surveyor's estimate, £1,000.]

BROMLEY.—For additions and decorations, "Rothesay," Plaistow-lane, Bromley, Kent. Messrs. G. Baines & Sons, architects, 5, Clement's-inn, Strand, W.C.:—

T. Crossley & Son	£309 10 0
T. D. Graty, Bromley*	262 0 0

COWES (Isle of Wight).—For the erection of a stable as a wing to Old Charlton, Baring-road, West Cowes, for Miss Sophia Groves. Mr. Philip Sturdy, architect, Bournemouth:—

Jenkins & Sons	£623	J. Nichol, Southampton†	£520
H. E. Day	525		

CROSS KEYS (Mon.).—For erecting nineteen houses, for the Cross Keys Progressive Building Club. Mr. R. L. Roberts, architect, Abercarn:—

J. Williams	£285 0	J. Pritchard, Pontymister, Mon.*	£198 10
J. Charles	245 0		
Thomas & Lyons	210 0	W. & D. Thomas	193 0
E. C. Jordan	209 0		
Davies Bros.	208 0		

DALSTON (Cumberland).—For the erection of a stone bridge, etc., at Powbeck, Dalston, for Carlisle Rural District Council. Mr. J. Graham, engineer, Bank-chambers, Bank-street, Carlisle:—

R. Little	£507 0 0	N. Harrison	£404 15 0
F. Millwood & Co.	410 10 0	R. G. Wilson, Dalston, Cumberland*	403 0 0
J. Laing & Son	405 14 0		

DESBOROUGH (Northants).—For constructing about 800 yds. of railway to join the Midland Railway, for the Co-operative Society. Mr. D. J. Diver, engineer, Desborough. Quantities by engineer:—

Dixon	£5,182	Johnson & Langley	£3,800
Drabble	4,662	C. Chamberlain	3,790
Eastwood	4,660	Dixon	3,528
Johnson & Son	4,480	T. Panter	2,995
Orton	4,319	Siddons & Freeman	2,875
F. Barlow	4,095	W. Brown	2,855
Coker	4 008	E. Heycock & Sons, Gt. Glen*	2,648
Harris	3,950		
Smith & Bunning	3,889		

HARROGATE.—For street improvement work Harlow Moor-road, South Drive, part of Langcliffe-avenue, etc., for the Corporation. Mr. F. Bagshaw, Borough Engineer and Surveyor, Municipal Offices, Harrogate:—

Harlow Moor-road.

B. Oxley, Wetherby-lane, Harrogate* £1,551 1 5

South Drive.

E. Long, 5, Albert-terrace, Starbeck* 1,261 16 6

Portion of Longcliffe Avenue.

B. Oxley, Wetherby-lane, Harrogate* 453 15 1

Portion of Tewit Well Road.

B. Oxley, Wetherby-lane, Harrogate* 1,234 1 2

HEREFORD.—For erecting a residence at Adam's-hill, Breinton-road, for Mr. E. F. Bulmer. Messrs. Groome & Bettington, architects, Palace-chambers, Hereford. Quantities by the architects:—

C. Cooke	£2,778 5	A. J. Colborne	£2,678 12
Beavan & Hodges	2,770 0	W. Bowers & Co.	2,481 2
W. P. Lewis & Co.	2,769 10	W. Powell, Hereford*	2,394 0

[Exclusive of sanitary fittings, glazing and casements, and heating.]

HOUNSLOW.—For erecting stores, stables, and foreman's cottage on the Pear Tree Estate, for the Heston and Isleworth Urban District Council. Mr. P. G. Parkman, Engineer and Surveyor to the Council, Town Hall, Hounslow. Quantities by Engineer:—

C. Gray, Shepherd's Bush* £4,330 1 0

IPSWICH.—For house, shop, and printing works, St. Peter's-street, for Mr. T. G. Garrod. Mr. J. A. Scheuermann, architect, 23, High-street, Ipswich. Quantities by Mr. J. S. Parmenter, Ipswich:—

W. Grayston	£1,613	R. Girling	£1,485
V. A. Marriott	1,595	W. H. Death	1,475
G. Kenney	1,563	Scales & Robins	1,469
C. Green	1,510	A. Sadler	1,420
M. Death	1,494	G. Grimwood & Sons, Ipswich*	1,333
H. J. Winzell	1,487		
S. Kenney	1,485		

KIDDERMINSTER.—For additional water supply (Contract No. 2):—

Biggs, Wall, & Co.	£4,500 16 5
C. Jordan & Co.	3,885 0 0
H. Roberts	3,713 0 0
R. W. Fitzmaurice & Co.	3,706 19 0
C. Chamberlain	3,544 0 0
J. W. Dean, Ltd.	3,525 0 0
Davies, Ball, & Co.	3,515 0 0
T. Vale & Son	3,450 0 0
G. Law, Kidderminster*	3,123 13 0

KINGLASSIE.—For extension to cemetery, including mortuary, tool house, etc., for the Parish Council. Mr. W. Birrell, architect, 200, High-street, Kirkcaldy. Quantities by architect:—

A. Wilson	£879 0 0	W. Henderson & Son	£680 5 0
A. Fraser, jun.	849 0 0	W. Page & Son, Thornton*	654 9 9
J. Miller & Sons	820 0 0		
W. Brown	820 0 0		
R. & J. McKee	808 8 3		

HANWELL.—For road works (Shakespeare-road, Cumberland-road, etc.), for the Urban District Council. Mr. S. W. Barnes, A.M.Inst.C.E., Surveyor, Council Offices, Hanwell, W.:—

	Shakespeare Road.	Southfield Cotts.	Cumberland Road (1st part).	Cumberland Road (2nd part).	Bostonthorpe Road.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
F. Fowles	2,087 8 9	438 17 9	1,632 13 6	193 13 8	803 6 7
B. Nowell & Co.	1,922 14 11	394 9 11	1,503 1 4	186 14 8	826 12 7
Harvey Bros.	1,906 8 3	420 14 8	1,574 9 6	184 3 4	803 7 2
R. Ballard, Ltd.	1,758 6 6	379 0 0	1,379 12 0	175 12 0	724 14 9
Woodham & Sons	1,743 0 0	359 0 0	1,319 10 0	166 10 0	678 10 0
Mowlem & Co.	1,646 6 4	389 12 6	1,330 1 8	157 6 3	705 7 8
Lawrence & Thacker	1,600 16 0	398 19 8	1,372 11 8	163 12 0	777 19 6
G. Wimpey & Co.	1,592 10 0	360 0 0	1,328 0 0	169 0 0	718 0 0
J. Macklin	1,577 12 0	396 13 1	1,416 0 6	199 1 1	766 9 9
W. Neave & Son*	1,443 12 0	332 13 8	1,186 19 6	156 3 5	655 12 6

LONDON.—For making up roadway and paving footways of Gunterstone-road extension, for the Fulham Borough Council. Mr. F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.:—

	Roadway.	Footway.
B. Nowell & Co.*	£390 0 0 ..	—
J. T. Mears	415 0 0 ..	—
G. Wimpey & Co.	455 0 0 ..	—
H. J. Greenham	480 0 0 ..	—
J. Ellis & Co.	—	£113 7 6
Croft Granite Co., Ltd.	— ..	122 0 0‡
F. Fowles	577 15, 8 ..	148 18 0
Alternate Tender	497 15 8 ..	—

[Surveyor's estimate, £120.]

‡ Taking up and relaying good paving, extra £5.

LONDON.—For making up roadway and paving footways of Elswick-street, Fulham, for the Fulham Borough Council. Mr. F. Wood, Borough Engineer, Town Hall, Fulham, S.W.:—

	Roadway.	Footway.
Harvey Bros.‡	£387 7 7 ..	£175 19 0
J. T. Mears*	440 0 0 ..	—
F. Fowles	444 0 0 ..	124 0 0
G. Wimpey & Co.	479 0 0 ..	—
H. J. Greenham	486 0 0 ..	—
B. Nowell & Co.‡	500 0 0 ..	—
J. Ellis & Co.	— ..	97 10 0
Imperial Stone Co.	— ..	99 0 0
Croft Granite Co., Ltd.‡	— ..	108 0 0

[Surveyor's estimate, £98.]

‡ No deposit.

LONDON.—For wood-paving works, for the Kensington Royal Borough Council. Mr. Wm. Weaver, Borough Engineer, Town Hall, Kensington High-street:—

	Lancaster-road.	Wright's-lane and Marloes-road.	Old Brompton-road.	Ladbroke-grove.
	Per super yard. s. d.	Per super yard. s. d.	Per super yard. s. d.	Per super yard. s. d.
Acme Flooring & Paving Co. (1904), Ltd.	9 9	9 9	7 11*	7 0*
Improved Wood Pavement Co., Ltd.	9 5*	9 5*	8 2	8 2
W. Griffiths & Co., Ltd.	9 6	9 6	8 6	7 5
J. Mowlem & Co., Ltd.	10 9	10 9	8 7	7 4
B. Nowell & Co.	11 9	10 4	8 3	8 5

TENDERS—*Continued on page 537.*

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COMPETITIONS, CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Public Library	Peterborough Council	50*l.*, 25*l.*, and 15*l.	June 30
*Shire Hall, Bury St. Edmunds	West Suffolk Standing Joint Comitt.	50*l.*, 30*l.*, 20*l.	July 2

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Taking Down Sheds and Removing Materials	Manchester Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester	May 14
Extension of Weetwood Hall, near Wooler	.....	Dickson, Archer, & Thorp, Solicitors, Alnwick	do.
Cottage at Weetwood Farm	.....	do.	do.
Six Electric Tramcars and Water Sprinkler	Pietermaritzburg Corporation	Mordey & Dawbarn, 82, Victoria-street, London, S.W.	May 16
Police Station at Dodworth, near Barnsley	West Riding County Council	J. Vickers Edwards, County Architect, Wakefield	do.
Heating Apparatus, Malin Bridge Council School	Sheffield Corporation	H. I. Potter, A.R.I.B.A., 115, Norfolk-street, Sheffield	do.
Materials, Sewage Works	Eccles Corporation	G. W. Willis, Sewage Works, Peel Green-road, Patricroft	do.
Outbuildings at Isolation Hospital, Beaufort	Ebbw Vale U.D.C.	T. J. Thomas, Town Surveyor, Ebbw Vale	do.
Welsh Church at Senghenydd	.....	I. J. Thomas, Wellington House, Senghenydd	do.
Dual Desks for Schools	Waterloo-with-Seaforth U.D.C.	J. I. Thompson, Clerk, Town Hall, Waterloo, Liverpool	do.
Alterations to 150 and 1790, High-street, Elgin	.....	J. Jamieson, Architect, 51, High-street, Elgin	do.
Water Tanks	Chorley Corporation	J. Mills, Town Clerk, Chorley	do.
Riverside Wall	Exeter City Council	T. Moulding, City Engineer and Surveyor, Exeter	do.
Gasholder Tank Work	Ayr, etc., Gas Company	Gasworks, Damside-street, Newton-on-Ayr, N.B.	do.
350 Tons of Broken Granite	Stowmarket U.D.C.	P. C. G. Hayward, Clerk, Stowmarket	do.
Four Houses, Drighlington	Miss S. J. Liley	T. A. Buttery & S. B. Birds, Architects, Queen-street, Morley	do.
Road Improvement, Kingston Main Road	Leatherhead U.D.C.	T. Salkield, Engineer and Surveyor, Council Offices, Leatherhead	May 17
Open Air Swiming Bath, Rottingdean	Brighton Guardians	B. Burfield, Clerk, Parochial Offices, Brighton	do.
Stores	Swansea Corporation	B. Mackenzie, Cray Reservoir Works, Breconshire	do.
Painting, etc., Great Eastern-street Bridge	London County Council	Engineer's Department, County Hall, Spring-gardens, S.W.	do.
Ashpit Cleansing	Bradford Cleansing Committee	E. Call, Destructor Works, Hammerton-street, Bradford	do.
Street Works, Station-terrace, etc., Caerphilly	Caerphilly U.D.C.	A. O. Harpur, Surveyor, Council Offices, Caerphilly	do.
Street Works, Garth-street, etc., Taff's Well	do.	do.	do.
Street Works, Lower Commercial-street, Senghenydd	do.	do.	do.
Sewerage Works, Peel-street, etc.	East Stonehouse U.D.C.	F. A. Wiblin, Surveyor, Town Hall, East Stonehouse, Devon	do.
Usworth Water Supply Works	Chester-le-Street R.D.C.	J. H. Mole, Surveyor to Council, Chester-le-Street	do.
Materials and Hauling for Main Roads	Monmouthshire County Council	W. Tanner, County Surveyor, Newport, Monmouth	do.
Twelve Houses at Treharris	The Oakland No. 2 Building Society	Osborne & Rees, Architects, Shingrig-road, Nelson, Glam.	do.
A Chapel, High-street, Mountain Ash	.....	T. W. Millar, Architect and Surveyor, Mountain Ash	do.
Tar and Ammoniacal Liquor	Lanark Gas Consumers Company	Mr. Stewart, Manager at the Works	do.
Two Dwelling-houses, Letterkenny	Mr. R. M'Cullagh	J. M'Intyre, Architect, Letterkenny	do.
Two Dwelling-houses, Swallow-lane, Golcar	.....	A. Shaw, Architect, Golcar	do.
*Extending a Building at Schools	St. George-in-the-East Guardians	Clerk's Office, Raine-street, Old Gravel-lane, E.	do.
Carting of Gravel	South Stoneham R.D.C.	W. J. Potter, District Surveyor, "Glenroy"	May 18
Materials for Steel Foundry	East India Railway Company	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Hematite Pig Iron	do.	do.	do.
Sixty-four Tenement Dwellings	Manchester Sanitary Committee	City Architect, Town Hall, Manchester	do.
Two Shops with Workrooms over	do.	do.	do.
Making-up Titchfield-rd. & Uckfield-rd., Enfield Lock	Enfield U.D.C.	R. Collins, Surveyor to the Council, Public Offices, Enfield	do.
Additions, etc., to Warehouse, etc., Ferry-rd., Bristol	Messrs. T. T. Chard & Sons	H. Williams, Architect, Alliance-chambers, Corn-street, Bristol	do.
Bathrooms, etc., at Union Workhouse	Market Bosworth Guardians	W. M. Sykes, Chapel-street, Ibstock	do.
Materials	Ham U.D.C.	W. Warner, Surveyor, Ham Common	do.
Cast-iron Tank at South Elmsall Sewage Works	Hemsworth R.D.C.	T. H. Richardson, Hemsworth, near Wakefield	do.
Two Gas Engines, New Wortley Gasworks	Leeds Corporation	R. H. Townsley, Gas Offices, Leeds	do.
11,000 Tons of Derbyshire Lime	do.	do.	do.
Gas Oil for Manufacture of Carburetted Water Gas	do.	do.	do.
Tubes, Bricks, Flags	do.	do.	do.
5,800 yds. of 6-in. Cast-iron Water Mains	Epsom U.D.C.	W. V. Graham, M.Inst.C.E., 5, Queen Anne's-gate, Westminster	do.
Cables	Brighouse Corporation	Lacey, Sillar, & Leigh, 2, Queen Anne's-gate, Westminster	May 19
Broughton-street Sewer	Edinburgh City Council	Burgh Surveyor, City-chambers, Edinburgh	do.
House at Llandough	Mr. J. Lloyd Roach	J. H. Thomas, Secretary, Pentwyn, Llandaff	do.
Furniture for Nurses' Home at Withington	Chorlton Guardians	D. S. Bloomfield, Clerk, Union Offices, All Saints, Manchester	do.
Sewer, Plough-lane, Beddington,	Croydon R.D.C.	R. M. Chart, F.S.I., Surveyor to the Council	do.
Alterations, etc., Finsbury-road Council School	Brighton Education Committee	T. Simpson & Son, 17, Ship-street, Brighton	do.
Making-up Station-road and Retreat-road	Southend-on-Sea Corporation	E. J. Elford, Borough Surveyor, Southend-on-Sea	do.
School, New Elgin	Elgin School Board	A. & R. M'Culloch, Architects, 3, Bernard-street, Leith	do.
Alterations, etc., at Farmhouse, Croy, Pluscarden	.....	J. Wittet, Architect, Elgin	do.
Rebuilding Stable Wing at Auctertyre	.....	do.	do.
Additions, etc., to Steading, Easter Kellas	.....	do.	do.
10,000 sq. yds. of 2½-in. thick Concrete Flags	Turton U.D.C.	V. W. Laithwaite, Sur., Council Offices, Bromley Cross, nr. Bolton	do.
Seven Cast-iron Sewer Ventilating Shafts, etc.	do.	do.	do.
140 lineal yds. of 9-in. Earthenware Pipe Sewer	do.	do.	do.
Alterations & Additions to Farm Buildings, Napsbury	Visiting Committee, Napsbury Asy.	W. G. Austin, Clerk, Guildhall, Westminster, S.W.	do.
Shop, etc., Sheringham	Co-operative Society	T. Inglis Goldie, A.R.I.B.A., Church-street, Sheringham	do.
Two Dwelling-houses, Varley-road, Slaithwaite	.....	A. Shaw, Architect, Golcar	do.
Work at Tormartin Rectory, Chippenham	.....	C. E. Ponting, Diocesan Surveyor, Marlborough	do.
Shop Fronts, etc., at Central Stores	Star Co-operative Soc., Chelmsford	C. & W. H. Pertwee, Architects, Bank-chambers, Chelmsford	do.
Stones and Rolling	Carrickfergus U.D.C.	J. Boyd, Clerk, Town Hall, Carrickfergus	do.
Footpath, etc.	do.	do.	do.
Sewage Farm Pumping Engines	Darlington Corporation	G. Winter, Borough Surveyor, Darlington	May 20
Waterworks	Wiveliscombe U.D.C.	T. V. Pearse, Clerk, Wiveliscombe	do.
Dressed Granite Kerb and Channel	Brighton Corporation	F. J. C. May, Borough Engineer and Surveyor, Town Hall, Brighton	do.
Repairs, etc., at Chartham Asylum	.....	W. J. Jennings, Architect, 4, St. Margarets-street, Canterbury	do.
Centring of Four Arches of Old Bridge	Ayr Corporation	J. Young, Town Surveyor, Ayr	do.
Outfall Sewer	Rugby U.D.C.	D. G. Macdonald, Surveyor to Council, Rugby	May 21
Sewers, Brighouse and Denholme Gate-road	Brighouse Corporation	A. M. Fowler, C.E., 1, St. Peter's-square, Manchester	do.
Sewers, Badger-hill to Lillands-lane	do.	do.	do.
Sewers, Toothill Bank to Rosemary-lane	do.	do.	do.
Sewers, Ogden-lane	do.	do.	do.
Sewers, River-street	do.	do.	do.
3,029 yds. of Cast-Iron Water Pipes, etc.	Tyldesley-with-Shakerley U.D.C.	R. H. Gurinan, Water Engineer, Tyldesley, near Manchester	do.
15-inch Water Main	do.	J. Brooke Smith, Council's Engineer and Surveyor	do.
Two 100-kw. Steam Dynamos	Mexborough U.D.C.	Engineer's Office, Electricty Works, Mexborough	do.
Repair of Roads, Strathdearn (21¼ and 19¼ miles)	.....	A. Mackenzie, C.E., Surveyor, Kingussie	do.
Repair of Roads, Kingussie Division (51½ miles)	.....	do.	do.
Repair of Timber Bridges	.....	do.	do.
Painting at Cemetery	Selby Burial Board	E. Townend, Clerk, Abbey-place, Selby	do.
House, Mount Pleasant, Goole	.....	H. Sherwood, Mount Pleasant, Goole	do.
Taking Down Brick Chimney	Glasgow Corporation	J. R. Sutherland, Eng., Waterworks Office, 45, John-st., Glasgow	do.
Public Hall, Institute, and Swimming Bath	Com., Llanhilleth Workmen's Inst.	D. Lloyd, Architect, Llanhilleth	May 23
Infectious Hospital, Selby	.....	Tennant & Bagley, Architects and Surveyors, Pontefract	do.
Slater Work at Granton New Works	Edinburgh, etc., Gas Commissioners	W. R. Herring, M.Inst.C.E., New-street Works, Edinburgh	do.
Sewer, Shield-row	Stanley U.D.C.	J. Routledge, Surveyor, Council Offices, Stanley	do.
Bridge to carry Bo'ness-road, Grangemouth	Caledonian Railway Company	Engineer, Buchanan-street Station, Glasgow	do.
Road Works, Standish, near Wigan	Standish with Langtree U.D.C.	Heaton, Ralph, & Heaton, Engineers, Wigan	do.
Sewer Works, Carlton, near Barnsley	Barnsley R.D.C.	W. J. Lomax, Engineer, 11, Fold-street, Bolton	do.
Conversion of Pail Closets	Stockport Parks Committee	J. Atkinson, Borough Surveyor, Stockport	do.
Workshops and Gymnasium, Chelmsford	Essex Industrial School Committee	F. Whitmore, Architect, 17, Duke-street, Chelmsford	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials,	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Two Resids., Willow Hall Estate, Burnley-rd., Halifax	.....	G. Buckley & Son, Architects, Tower-chambers, Halifax	May 24
Materials	Leyland U.D.C.	Surveyor's Office, 21, Towngate, Leyland	do.
Electricity Supply Extension	Partick Town Council	J. Donaldson, Town Clerk, Burgh-chambers, Partick	do.
Tarpaving Materials	Woodford U.D.C.	W. Farrington, Surveyor, Council Offices, Woodford Green	do.
Rebuilding of Bridge over the Dutch River	Doncaster Corporation	Mr. Crabtree, Borough Surveyor, Doncaster	May 25
Lighting Feeders, Mains, and Roadwork	Handsworth U.D.C.	H. Ward, Clerk, Council House, Handsworth, near Birmingham	do.
Lighting Streets and Roads	Milford Parish Council	G. Barr, Clerk, Milford	do.
Covered Service Reservoir, Wood-la., Rothwell, Haigh	Rothwell U.D.C.	W. E. Richardson, Architect, Rothwell near Leeds	do.
Market Hall, Shops, etc., Oldham	Markets and Baths Committee	Leeming & Leeming, Architects, 117, Victoria-st., Westminster	do.
Rebuilding Arch	Bicester R.D.C.	G. Walsh, Clerk, Bicester	do.
Making-up Passage	Ramsgate Corporation	T. G. Taylor, Borough Engineer, Albion House, Ramsgate	do.
30 Houses near Rhymney Railway Station at Pengam	Glan-y-nant Building Club	P. V. Jones, Architect and Surveyor, Hengoed	May 26
Boys' Grammar School	Bingley Grammar School Trust	W. Rhodes Nunns, Architect, Market-street, Bingley	do.
Wesleyan Chapel and Schools, High Bentham, Kendal	.....	J. F. Curwen, F.R.I.B.A., 26, Highgate, Kendal	do.
Sewers, West Drayton	Uxbridge R.D.C.	J. Freebairn Stow, Engineer, Corn Exchange, Uxbridge	do.
*Wood Paving Works	Hampstead Borough Council	O. E. Winter, Town Hall, Haverstock-hill, N.W.	do.
Fairburn Waterworks	Pontefract R.D.C.	J. Waugh, C.E., Sunbridge-chambers, Bradford	May 27
Stores	Darwen Gas Committee	A. H. Smith, Gas Engineer, Darwen	do.
1,610 cubic yds. of 2-in. gauge Broken Granite	Ashford U.D.C.	W. Terrill, Surveyor, Ashford, Kent	do.
*Painting and Cleaning Works, Darenth Asylum	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
Overhead Equipment, Trolley Wires, Poles, etc.	Kilmarnock Corporation	W. Middlemas, Town Clerk, Kilmarnock	May 28
Rolling Stock	do.	do.	do.
Wiring of Generating Station and Shed	do.	do.	do.
Granite	Hadleigh U.D.C.	C. J. Grimwade, U.D.C. Offices, Hadleigh, Suffolk	do.
Main Sewers in Craigie District	Perth Town Council	R. M'Killop, Burgh Surveyor, 12, Tay-street, Perth	do.
Overhead Equipment	Royton and Crompton U.D.C.'s	R. P. Wilson, 66, Victoria-street, Westminster	do.
Cables	do.	do.	do.
Schoolhouse, Newmill, Keith	School Board of Keith	C. C. Doig, Architect, Elgin	do.
Masonic Hall, Whiteabbey	Building Committee	D. Coote, 6, Lewis-street, Belfast	do.
Residence, Creevagh, Ardee	Mr. J. G. M'Keever	F. Shaw, Architect, 36, South Frederick-street, Dublin	do.
Ten Houses, Fulford, York	Mr. G. Wood	A. H. Everist, Architect, 8, New-street, York	do.
Electricity Plant	Hornsey Town Council	R. Hammond, M.Inst.C.E., 64, Victoria-street, Westminster	May 30
Extension of Sewer in Church-lane	Southwick U.D.C.	G. W. Warr, Surveyor to Council, Southwick, Sussex	do.
1,000 Tons of Granite	Witham U.D.C.	W. B. Blood, Clerk, Witham, Essex	do.
Girls' Orphanage at Wilpshire	.....	Briggs & Wolstenholme, Architects, Richmond-terrace, Blackburn	do.
Making-up, etc., Bolton-crescent	New Windsor Town Council	Borough Surveyor, Alma-road, Windsor	May 31
*Casual Wards & Receiving W'kh'se, Sheffield-st., etc.	Guardians of Strand Union	A. A. Kekwick, 18, Outer Temple, W.C.	do.
*New Post Office at Barnet	H.M. Works	H.M. Office of Works, Storey's-gate, S.W.	do.
*Making Up Roads	Acton District Council	Council's Surveyor, 57, High-street, Acton, W.	do.
*Extension of Town Hall	M.B. of Fulham	Borough Engineer, Town Hall, Fulham, S.W.	June 1
Bogie Passenger Engines and Tenders	East India Ry. Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
*Erection of Verandah at Workhouse	St. Leonard Shoreditch Guardians	F. J. Smith, Architect, Parliament-mansions, Victoria-street, S.W.	do.
Free Library Haslingden New-road	Rawtenstall Corporation	J. Johnson, C.E., Borough Surveyor, Municipal Offices, Rawtenstall	June 2
Stores	Penrikyber Navigation Colliery Co.	Secretary, Penrhiwceiber, R.S.O., Glam.	do.
Permanent Way (Tramways)	Rochester Corporation	E. Rotter, A.M.Inst.C.E., 47, Victoria-street, Westminster	June 3
Overhead Line	do.	do.	do.
Free Public Library	Teddington U.D.C.	H. A. Cheers, Architect, 35, Waldegrave-park, Twickenham	June 4
Stores and Materials	Pontypridd U.D.C.	E. Jones, Gas Engineer, Treforest Gasworks, near Pontypridd	June 6
Timber Groyne	Ventnor U.D.C.	E. J. Harvey, Surveyor to the Council	do.
*Alterations, etc., to Napsbury Asylum, near St. Albans	C. C. of Middlesex	Clerk to the Visiting Committee, Guildhall, Westminster, S.W.	do.
W. Cornwall Hospital & Dis., St. Clare-st., Penzance	.....	O. Caldwell, F.R.I.B.A., Victoria-square, Penzance	June 9
*Balcony Dwellings for Working Classes	London County Council	Architect's Department, 11, Charing Cross-road, W.C.	June 14
*New Schools in Queen's-road, Nuneaton	Nuneaton & Chilvers Coton U.D.C.	H. Quick, 64, Hertford-street, Coventry	No date
*Alter. thirty-eight houses, Bull Cragg, Ferryhill-sta.	.....	G. Walker, Ferryhill	do.
Customs House and Shipping Office, Port Talbot	Directors Port Talbot Rly., etc. Co.	E. Knott, Secretary, Port Talbot	do.
Two Cottages, Staveley	.....	R. Mitchell, 17, Haymarket, Sheffield	do.
Two Stone Villas, ten miles from Sheffield	.....	"Builder," 5, Sheffield *Telegraph*	do.
Two Cottages, Thurgoland	.....	W. T. Campsall, 19, Fig Tree-lane, Sheffield	do.
Draining Agricultural Land near Brecon	.....	B. L. Pritchard, Castle-street, Brecon	do.
House, Station Hill, Bridgend	.....	P. J. Thomas, Architect, Bridgend	do.
Laboratories and Science Buildings, Exeter	.....	J. Jerman, F.R.I.B.A., 1, Bedford-circus, Exeter	do.
Suspension Footbridge over River Swale	.....	Rev. W. F. McNeile, Brafferton Vicarage, Helperby, Yorks.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Building Department Manager	Co-operative Wholesale Society	Not Stated	May 23
*Clerk of Works	Cumberland & Westmorland Asym.	Not Stated	May 24
*Surveyor and Water Engineer	Lichfield Conduit Lands Trustees	150*l.*	do.
*General Assistant	Borough of Bromley	100*l.* per annum	May 25
*Head of Engineering Department	Northern Polytechnic	275*l.*	June 8
*Teacher of Cookery	do.	110*l.*	do.
*Teacher of Architectural Drawing	do.	Not Stated	do.
*Teacher of Brickwork	do.	Not Stated	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. xii. *Public Appointments*, xviii.

TENDERS.—*Continued from page* 535.

LONDON.—For the supply of 7,000 electric lamps of British make, to be kept in stock at the general stores, 19, Charing Cross-road, for the London County Council:—

General Electric Co., Ltd.	£280 6 3‡
Sir Hiram Maxim Electrical and Engineering Co., Ltd.	248 15 0‡
Mackey's Electric Lamp Co., Ltd.	244 11 8‡
Edison and Swan United Electric Light Co., Ltd.	237 14 2§
Sunbeam Lamp Co., Ltd.*	235 10 5‡

‡ 2½ per cent. discount. § Net.

LONDON.—For repaving the carriageway, Lambeth Bridge, for the London County Council:—

	Per sq. yd. s. d.
Acme Flooring and Paving Co., Ltd.	9 8
J. Mowlem & Co., Ltd.	8 9
Improved Wood Pavement Co., Ltd., London*	8 8

MORTLAKE.—For building boundary wall, gates, and fencing, to Isolation Hospital in South Worple Way, for the Barnes Urban District Council. Mr. G. Bruce Toms, Surveyor to the Council, High-street, Mortlake:—

Crabb & Son	£470
A. Hunt & Son, 12, Archway-street, Barnes, S.W.*	465

MAIDSTONE.—For road making, Cornwallis-road, for the Urban District Council. Mr. T. F. Bunting, Borough Surveyor, Fair-meadow, Maidstone:—

M. Batchelor	£584 0	W. T. Burrows	£493 15
J. H. Bridge	496 0	Clarke & Epps*	440 0

[All of Maidstone.]

MORTLAKE.—For alterations and additions to the electricity station in High-street, for the Barnes Urban District Council. Mr. G. Bruce Toms, Surveyor to the Council, High-street, Mortlake:—

A. Hunt & Son	£524 0
B. E. Nightingale	514 0
Aldridge & Son, 78, Harlesden-road, Willesden Green, N.W.*	455 13

LONGLEAT.—For house fire protection:—

Hodder & Son	£2,100 0 0	Davies, Ball, & Co.	£1,560 0 0
T. Lydford	1,978 14 0	H. Franklin	1,533 14 6
S. Ambrose	1,890 6 0	W. Westwood	1,473 11 8
W. Hancock	1,883 16 0	J. Byard & Son	1,440 0 0
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A. Wills & Sons	1,839 0 0	J. Bird	1,340 0 0
J. Riley	1,834 0 0	A. L. Ponton	1,325 6 1
T. Vale & Sons	1,830 0 0	Tryhorn & Son	1,315 0 0
W. S. Bushnell	1,810 0 0	Rogers & Wood, London, S.E.*	1,296 9 0
Rowell & Sons	1,691 1 3	W. E. Bennett	1,230 0 0
R. Butcher & Son	1,585 17 0		

MIDDLESBROUGH.—For extending boiler house and engine house, etc., at electricity works, Snowdon-road, for the Electric Lighting Committee. Mr. Frank Baker, Borough Engineer. Quantities by Borough Engineer:—

H. Walker, Linthorpe, Middlesbrough* £3,056 10 0

PENARTH.—For erecting a public library and caretaker's house, for the Urban District Council. Mr. H. Snell, architect, Stanwell-road, Penarth:—

——	Library.			House.			—		
	£	s.	d.	£	s.	d.	£	s.	d.
J. Allan	4,100	0	0	520	0	0	4,620	0	0
T. Bevan	4,650	0	0	630	0	0	5,280	0	0
Blacker Bros.	4,075	10	0	546	0	0	4,621	10	0
F. Bond, Canton, Cardiff*	3,870	0	0	550	0	0	4,420	0	0
W. Bowers	4,420	0	0	585	15	3	5,005	15	3
D. Davies	4,735	0	0	670	0	0	5,405	0	0
D. W. Davies	4,680	0	0	635	0	0	5,315	0	0
E. R. Evans & Bros.	4,560	0	0	600	0	0	5,160	0	0
J. Jones	4,480	0	0	556	0	0	5,036	0	0
Lattey & Co.	4,965	0	0	717	13	10	5,682	13	10
W. T. Morgan	4,088	0	0	512	0	0	4,600	0	0
D. G. Price	4,951	15	6	685	14	7	5,637	10	1
J. S. Shepton	4,815	0	0	743	0	0	5,558	0	0
W. Symons & Co.	4,116	0	0	530	0	0	4,646	0	0
E. Turner & Sons	4,450	0	0	586	0	0	5,036	0	0

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RASHCLIFFE (Huddersfield). — Accepted for erecting chapel and classrooms in Victoria-street. Mr. Ben Stocks, architect, St. Peter's-street, Huddersfield:—

Masons: W. Mallinson & Sons, Lockwood, Huddersfield	£458 0 0
Joiners: H. Atha, Newsome-road, Huddersfield	289 0 0
Plumber: T. A. Armitage, Huddersfield	99 10 0
Slater: T. B. Tunnacliffe, Huddersfield	75 10 0
Plasterer: G. H. Day, Milnsbridge, Huddersfield	59 0 0
Painter: R. Heaton, Paddock, Huddersfield	29 15 0
Concreter: J. Cooke, Huddersfield	31 4 10
Heating: Tomlinson & Milan, Ltd., Huddersfield	114 0 0

STOKE GABRIEL (Devonshire).—For erecting a stable, bullocks' house, etc., at Well Farm, Port Bridge, for Colonel R. W. Studdy. Mr. W. F. Tollitt, architect, 10, High-street, Totnes:—

H. Drew	£876	T. Brook, Totnes*	£747
Veale & Son	819	R. E. Narracott	735
G. Leaman	780		

SWANSEA.—For erecting a villa residence in Eversley-road, Coedsaeson, for Mr. T. Tustian. Mr. C. T. Ruthen, architect, Bank-chambers, Heathfield-street, Swansea:—

H. Billings	£1,005	T. Richards	£943
D. Jenkins	993	J. Marles & Sons	885
Lloyd Bros., Argyle-street-yard, Swansea*	966		

WANSTEAD.—For main road special improvements, 1904, for Wanstead Urban District Council. Mr. C. H. Bressey, Surveyor, Council Offices, Wanstead, N.E.:—

—	High-street Paving.	Cambridge Park Tarpaving	Woodford-road Kerbing.
	£ s. d.	£ s. d.	£ s. d.
T. Adams	105 0 0	26 0 0	154 0 0
Atlas Stone Co.	135 0 0	35 0 0	183 0 0
F. Barry	112 16 10	23 17 6	142 10 0
Bradshaw & Co.	—	—	—
Brooks, Ltd.	—	—	—
F. Bradford	143 17 6	—	—
J. Coney	—	—	—
Croft Granite Co.	—	—	—
Crouch Valley Brick and Tile Co.	107 10 0	—	—
W. Delaney	110 6 0	18 6 0	137 0 0
J. Ellis & Co.	114 13 4	—	—
Empire Stone Co.	110 0 0	—	—
W. French & Co.	127 5 0	24 7 0	160 0 0
B. W. Glenny	—	—	—
Goddard & Co.	—	22 12 6	—
Grounds & Newton, Page Green, South Tottenham	111 1 8	*17 14 2	153 17 4
W. Griffiths	120 5 0	26 16 8	149 9 4
A. C. W. Hobman & Co.	—	—	—
Hard York Nonslip Stone Co.	—	—	—
Imperial Stone Co.	139 0 0	—	—
J. Jackson, Clova-road, Forest Gate	*95 15 0	30 15 0	*140 0 0
E. Lamble	99 0 0	22 0 0	158 0 0
G. R. Mann	125 0 0	35 0 0	210 0 0
Parsons & Parsons	123 11 4	22 14 0	163 1 2
Phœnix Stone Co.	—	—	—
A. W. Porter	119 10 0	25 0 0	150 0 0
E. J. Van Praagh & Co.	—	—	—
Preston Granite Co.	—	—	—
F. Smart & Co.	—	27 18 4	—
A. C. Soan	127 4 2	27 12 6	180 0 0
Wilson, Border & Co.	114 13 4	26 18 4	18 14 8

ST. ALBANS.—For boring two tube wells at Kinsbourne Green, near Harpenden, for the Rural District Council. Mr. H. F. Mence, Surveyor, 14, London-road, St. Albans:—

T. Matthews	£310 0	R. Richards & Co.	£180 0
W. A. Spanon	221 0	G. Eastell & Son	172 0
C. Isles & Co.	215 0	Le Grand & Sutcliff	169 0
Merryweather & Sons	210 5	Cheeld & Co., Chesham*	146 0
T. Tilley & Sons	210 0	C. Martin	144 0
J. Thom	189 0		

WEST HAM.—For making-up Chargeable-lane, for the Borough Council. Mr. J. G. Morley, Borough Engineer, Town Hall, West Ham, E.:—

D. T. Jackson	£2,263 18 10	Parsons & Parsons	£1,847 18 3
T. Adams	2,233 19 6	G. J. Anderson, Poplar*	1,819 17 4
J. Jackson	2,051 17 2		
W. Griffiths	1,908 13 6		

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The Builder.

VOL. LXXXVI.—No. 3193. MAY 21, 1904.

ILLUSTRATIONS.

Competition Design for Liverpool Cathedral: Perspective View ..... By Messrs. Nicholson and Corlette.
Kingsgate House, High Holborn ..... Mr. Arthur Keen, F.R.I.B.A., Architect.
Technical School and Free Library, Ramsgate ..... Mr. Stanley D. Adshead, Architect.
"Chestall House," Staffordshire } ..... The late Mr. Larner Sugden, Architect.
"One Ash," Loughboro' }

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French Painting and Sculpture of the Year.

THOSE who may go to Paris to see this year's Salons should beware of being misled by the foolish cant of newspaper "art-critics," repeated by rote for the last four or five years, that the New Salon is the exhibition of the higher and more intellectual artistic interest. It is now the fashion to say so, as it is the fashion to sneer at the Royal Academy exhibitions, if you want to take ground as an æsthetic and up-to-date critic; but there is no truth in it. The Old Salon no doubt contains a great many coarse and flaring works, though even in these a certain standard of execution is always maintained; the New Salon seems, at first sight, less glaring and better-arranged and hung. But it contains worse things than would ever be admitted into the Société des Artistes Français; and it would be interesting to know how the critics who maintain the peculiarly artistic atmosphere of the New Salon justify the presence there of such things as M. Anquetin's ceiling painting, or M. Jules Flandrin's childish "La Mascarade"; M. Koos's "La Vie Heureuse," with its figures of the colour and texture of sandstone; M. Desvallières' daubs of figures at the Moulin-Rouge, or M. Raffaëlli's "Paysage de Bretagne," which looks like a landscape drawn in what schoolboys call "red raddle" on a surface of coarse sandpaper. There are some beautiful things in the New Salon, and they are all the better appreciated, it may be admitted, because the pictures are less crowded and better grouped; but the fact remains that if you were to pick out all the good pictures in the Old Salon, you would have an exhibition which for power and variety would leave the New Salon nowhere. As to sculpture, there is no possible comparison; the sculptors, like the architects, cling nearly in a body to the old institution, M. Rodin being the sole exception of any importance.

The New Salon may boast, however, of the largest picture of the year, and a fine one too—M. Berteaux' immense canvas, "Bretagne Mystique," some 70 ft. in length, hung in one of the staircase halls, and intended for the staircase of the Art-Museum of Nantes. It represents a long votive procession coming along the cliffs overlooking the sea, and is a very favourable example of those large decorative pictures for public institutions, of which so many are produced in France, and so few, for want of any encouragement and opportunity, in England. The whole effect is fine and luminous, and the separate groups in the procession are interesting and carefully studied. A decorative picture is also the largest and one of the finest works in the Old Salon, M. Henri Martin's triptych "Travail," representing in its three compartments morning, midday, and evening. Like the "Bretagne" picture, this is art glorifying every-day life; and M. Martin's peculiar technique (carried almost to excess here), in which the pigment seems to be put on in ridges, assists in this case in giving an abstract effect to the picture and enabling him to treat real life without becoming too realistic; the "midday" section of the picture, representing work at the docks, is a remarkable example of rich yet subdued colour obtained from a representation of ordinary working-men at an every-day task, the result depending to a great extent on the rough texture and surface of the painting, which gives depth and precludes hardness. This picture is for the decoration of the Savings Bank at Marseilles. There are one or two of those official paintings by which the authorities generally like to memorialise a public ceremony; M. Tattegrain has been told off to commemorate the "Cérémonie des Récompenses" in connexion with the 1900 Exhibition—a task which suits his special gifts well enough, though, if better painted, it is not more interesting than such pictures usually are; and M. Chartran paints, by State Commission, the celebration of the Victor Hugo centenary in the Panthéon; one would wish to see him employed an another kind of task, but he has made a bright and effective representation of the scene.

There is no indication of any special movement in French art this year, unless it be that there is rather a tendency towards pictures with a moral or meaning of some kind. Thus M. J. Paul Laurens exhibits as his principal work a very large painting called "Les Mineurs," a melancholy scene in which a long file of miners, men and women, released from their work, tramp over mounds of mine and furnace refuse, with sad worn faces; smoke and chimneys filling up the background. It is a sombre painting, the main object of which is an appeal to our humanitarian

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sympathies. His other work, "Luther et ses Disciples," where Luther lectures to a few of his followers in a Gothic chamber (perhaps Wurtzburg), behind an open Bible lighted by a candle in front, is also obviously didactic in its tendency; but it is a finely imagined and effective scene. The desire to point a meaning relative to the present day has rather wrecked M. Gervais for this year; his "Vers la Lumière," a ceiling painting for a library, is a kind of symbolism of the modern effect of electric power, by no means very decorative or pictorial, with its engines and telegraph-wires twisted about among flying figures; he has rather thrown away his genius both on this and on his satirical picture of centaurs and nude nymphs flying in alarm up the banks at the sight of an automobile on the road; the classic groups are very good, no doubt, but the picture is an elaborate joke that was hardly worth the ability displayed in it. M. Hippolyte Flandrin has produced a moral work of more serious and pathetic import in his "Jésus pleure sur la Ville," illustrating the verse, "and when he beheld the city, he wept over it," etc. "La Ville" is not Jerusalem, but modern Paris, which forms the background to the very beautiful and expressive figure of Christ; there is a fine solemn feeling about it, and it is certainly a far superior work, both in sentiment and in artistic refinement, to the one in the Royal Academy, in which the same kind of contrast between the figure of Christ and the vanities of the world is symbolised; there is no harsh and theatrical contrast of real and ideal, for the view of the modern city is quite subordinate in the composition, only sufficient to show what is intended. While on Biblical subjects one may mention also M. Humbert's fine picture "L'Inévitable," in which something of a new turn is given to the old subject of the expulsion of Adam and Eve from Paradise, the dark avenging angel hovering immediately behind them; there is a pathos in the face of Eve which raises this quite out of the category of the ordinary "Bible picture."

The keen æsthetic perception of French artists in regard to the relation between design and material is admirably illustrated in M. Toudouze's "La Mort de du Guesclin," an extraordinary-looking work with flat figures as if cut out, and decorative angels in the foreground, which, seen among the other paintings, impresses one at first as a mere piece of eccentricity; until we find, on reference to the catalogue, that it is a painting to be executed in tapestry at the Gobelins. Then we see what the artist was aiming at, and recognise that he has produced exactly the kind of thing that is best suited for tapestry. The work, when carried out, is to form a decoration for the principal chamber of the Parliament House of Rennes.

The taste for surgical and clinical pictures is still kept up, as witness M. Jonas's very realistic and unpleasant picture, "La Leçon de Dissection," not redeemed, as in the dissection picture of a greater master, by any nobility in the heads or the composition. Among other uncomely features of the Old Salon are such vulgarities as M. Galand's "American Bar" and the "Mi-Carême" of Mr. Mac-Cameron, a Chicago-born painter who is (save the mark!) a pupil of M. Raphael Collin; one can but wonder what that painter of lovely poetic visions thinks of this work of his pupil. Among this class of pictures of the realities of Parisian life M. Buland's "L'Inquisition chez les bouilleurs de cru, en 1901," is redeemed by its dramatic vivacity of character, especially in the figure of the official taking notes with his eye on the delinquent. It is not decorative certainly, but it is a phase of modern life represented with great force and humour.

Among the class of pictures which are purely decorative and imaginative there is perhaps not one which touches the highest of which French art is capable, but there are some fine things; notably M. Benner's "Dans l'Ombre de la Pensée," two draped ideal figures regarding each other solemnly by a dark and lonely water in a deep ravine. M. Raphael Collin shows all his usual poetry and delicacy both of artistic style and sentiment in his beautiful half-length of a nymph under trees, with the title "Silence." Some of the best drawn and best executed works of this class fail of effect from a total lack of poetic sentiment. M. Bouguereau of course fails in this respect; his one picture, "Une Dryade," a nude with one leg drawn up in a rather awkward attitude, is a masterpiece of drawing, but when you have said that you have said all. M. Zier's "Crépuscule," a nude figure seated among sea-weed covered rocks, the upper part of the figure relieved against the evening sky, would have been a fine thing if he had but put some expression into the head; but there he fails us, and loses a fine opportunity. Among pictures which are simply figure-studies and hardly profess to be more, there is one small work by M. Friant in the New Salon—"Peinture mystique," where a nude model poses for an artist who is painting an angel; the figure of the model, only a few inches high, may perhaps justly be said to be the finest piece of painting, purely as perfection of execution, in the whole of the two Salons; and perfection of execution is always something. A larger-size nude study, "Paresse," by Mdme. Lee-Robbins, an American by birth, also in the New Salon, is a masterly piece of work of its kind, simply as an "Etude" in position and drawing, though the colour is somewhat dingy and uncertain. Of what the French students call "conscientious nudes" there are of course plenty of examples, many of them very good, but their interest is rather academical.

Paintings of society scenes, indoors and outdoors, seem very much in vogue, and many of them do not show much to justify their scale and the degree of talent in mere execution displayed in them. Pictures of this class should either illustrate some problem in execution, or suggest something beyond the mere representation, if they are to be taken seriously. A dinner-table scene in the New Salon, "Entre Intimes," for instance, by M. Bouvet, is a most realistic representation of a dinner-table and of a middle-class French family; one can almost fancy one knew the people, but one could not fancy them interesting to know; nor does the picture, clever as it is in a way, amount to anything more than clever imitation. M. Caro-Delvaille's "Ma Femme et ses Sœurs" is just as uninteresting, save that it has a little more of decisively-marked style in the treatment of the subject; this has been purchased by the State, why it would be hard to say; perhaps to encourage a new man. The State purchases from the Salons are very capricious and devoid of any guiding principle. Topographical landscapes seem to be rather favoured, perhaps with the intention of presenting them to some public building in town or neighbourhood illustrated; at all events they are seldom among the most remarkable works of the year, though always meritorious; the Government is well advised on that score and will hardly be found purchasing a bad picture. Probably personal considerations, or the popular interest of a subject, weigh a good deal: though this is hardly the best way for the State to encourage art. In the Old Salon there are one or two society pictures which stand out from the ordinary run for their special interest and significance. Among these is M. Ridel's "Histoire d'un Passé," an earnest conversation between two ladies over their dessert, the one bending over and evidently speaking low to the other: there is a dramatic interest in this; it affects us like a scene out of one of Brada's novels; and as to style, M. Ridel is never weak or commonplace. Another is M. Rieder's "Soir d'Eté," an interior with one figure seated by lamplight, another leaning over a balcony in the twilight, looking out on the sea; this also stirs the fancy and suggests a story, and is more than a mere representation of ordinary surroundings. One small society picture, the "Punch" of M. Michaud, though it tells no story, attracts one by sheer ability and force of composition and colour; it is merely a girl standing in an ante-room making the punch, with part of the lighted dining-room seen through a door—commonplace enough in idea, but the admirable treatment of the whole scene gives it individuality. An interesting example of the treatment of a scene of *vie intime* in a decorative sense is furnished by M. Aman-Jean's "La Confidence (Panneau Decoratif)," in the New Salon; a large outdoor picture where a lady sits on a garden seat and another leans over it from behind to talk with her; a mass of foliage fills up the background; the work is truly decorative in effect, and at the same time suggestive in the way of sentiment, a combination of interest that is not very often found in painting, and is proportionately interesting. Then there is M. Béraud's small and most minutely studied painting "Le Cercle," which is certainly not decorative any more than men in a club-room are usually decorative; it is a kind of painting that constitutes a criticism of life, and a very shrewd and merciless one; as such it is rigorous and pointed to a degree, and evidently finished *con amore:* style, it must be admitted, there is none, but most conscientious finish of detail, and great satirical power.]

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Among the few figure pictures of the New Salon that are really interesting are to be noted M. Agache's "Deuil," two women kneeling by a crimson-draped coffin; a picture which combines pathos with fine lines of composition; and M. La Touche's "La Fille des Fauns," another of the paintings of the year with a moral, and (if we read it right) a very striking one, though hardly one to be understood by chance spectators. As a matter of colour and effect it is one of the artist's most effective works. In "Sur les Cimes," a figure of a bloodless lady seated among mountain peaks, M. Dagnan-Bouveret is doing the kind of thing that Leighton used to do, but by no means so well. There is some interest in M. Louis Picard's experiments with female figures half lost in a kind of golden haze of light; it is a trick of art, but the results in this case are certainly not without poetic suggestiveness. Mr. Cottet, who promised to be a remarkable painter, now goes to the opposite extreme from M. Picard, and paints figures in the middle of landscape in so hard and crude a fashion that they look as if cut out of pasteboard; and in his "Jour de Fête," moreover, the faces of the figures are hardly distinguishable in colour and texture from the middle distance field behind them. M. Cottet is a lost man unless he gets out of this groove.

There are many fine and effective portraits this year; no single one that can be picked out as the portrait of the year, but perhaps a larger number than usual that are striking successes as combining artistic and original pictorial effect with (it is to be assumed) personal verisimilitude. M. Bonnat's leading work is a simple, straightforward portrait of an American gentleman; a likeness merely, but a vigorously-painted one. Among portraits of more special artistic interest M. Chabas has a group of four round a table ("Coin de Table") which makes a most completely balanced picture. Among many others one may pick out especially M. François Flameng's "Portrait de la Baronne de R——," seated, in a purple cloak; a very fine and forcible painting; that the lady's waist is too small is probably not the fault of the artist. There is M. Aimé Morot's charming group of his own wife and daughter; and in the New Salon a very attractive portrait group of a mother and boy by M. Morisset, exceptionally good both in composition and colour. But by far the majority of the really fine portraits are to be found in the Old Salon. To the latter belong also the successes in battle pictures; among them is M. Sergent's small painting of Ney, bare-headed, charging at the head of a body of cavalry at Waterloo, and a large picture by M. Hoffbauer (who, in spite of his name, is a Parisian by birth and the pupil of three leading Paris artists) "Coin de Bataille," a kind of Erckmann-Chatrian painting of the ugly realities of war; a corner of a wood where there has been a fight, and only the results of it are visible. This also, we supposed, may be grouped among the pictures with a moral. In the matter of still life painting, too, one may say that the Old Salon carries off all the honours, culminating in M. Grun's "Interieur Breton," which is quite sublime in the painting of the great brass vessel that forms the salient feature of the scene.

Landscapes at the Old Salon raise "obstinate questionings" concerning the real object of landscape-painting; some of the finest differ so greatly in their aims and methods. M. Harpignies' two works are the perfection of a noble and intellectual convention of style, not so much imitating as translating nature. M. Didier-Pouget's large painting, "Le Matin dans la Corrèze," is a piece of actual creation over again of a romantic piece of landscape, with a vividness and force of realism which are quite astonishing; as a mere piece of representation of nature it would crush everything in our London exhibition, and almost converts one to realistic landscape. On a smaller scale and in less romantic subjects M. Biva has achieved an astonishing truth of effect in his representations of foliage and its reflection in water; but here one must admit that the quality shown is talent and painstaking rather than genius; Harpignies represents the higher school, the higher theory of landscape painting. Both Salons are strong in landscape; in the Old one may mention especially M. Lecomte's exceedingly fine picture, "Mortefontaine," so perfectly balanced in all its elements; one is not surprised to find that he is a pupil of M. Harpignies. And in the New Salon M. Lhermitte's "Moisson dans la Vallée" is perhaps the most perfectly satisfactory picture to be found there. There is also a group of small landscapes by M. Iwill which are of remarkable excellence; and M. Albert Dagnaux, in two small pictures, has made the interesting experiment, which we do not remember to have seen made before, of painting the same scene, "Bords de la Seine à Mantes," twice over from almost the same point of view, in sunshine and in storm; an instructive comparative study of effect.

In sculpture there is no work of supreme interest this year; no one of those productions which, once seen, can ever be forgotten; yet the vitality and energy of French sculpture, and the generally high standard of execution, are astonishing. It is no exaggeration to say that from the crowd of works in the central court of the Old Salon you could pick out a sufficient number of really good works—not all of the same interest, but all up to a high standard—to fill the whole of the rooms at the Royal Academy, supposing the works to be spaced so as to be properly seen. The popular attraction this year is Gérome's posthumous work "Corinth," a nude figure seated cross-legged on the top of a gilded Corinthian capital, bedecked with jewellery executed in enamels, and tinted to something approaching the colour of nature. Its exhibition in London would send the "British matron" into hysterics—not altogether without excuse. It is a very sensuous piece of work, absolutely devoid of intellectual interest. The exhibition is fortunately not without some of those examples of an intellectual idea expressed through sculpture which form the highest achievements of the art; among them M. Gustave Michel's figure of an astronomer with a chart of orbits in one hand, and with the title "Extase de l'Infini"; a truly noble work in every sense. M. Mercié exhibits his monument to de Musset, in which the poet, looking very sentimental in a cloak, sits on a rock, while a draped Muse on tiptoe behind him points with one hand. One would guess from it that the sculptor was not very much in sympathy with de Musset, who in fact is now regarded in France as rather out of date. M. Coutan exhibits a front of a funeral chapel, with fine figures representing "l'Espérance et La Prière" on either side of the portal; the whole composition is completed by a large crowning group, "Vers l'Infini," exhibited separately; a figure rising from the tomb amid marble clouds and angels, which is far too boisterous in its movement for sculpture, and reminds one too much of the sensational monuments of Roubiliac. Among works connected more or less with architecture are M. Bartholdi's model for a monument in memory of the balloon and pigeon service of the siege; M. Carlier's "La Danse Profane," a spirited figure for the decoration of the garden of the Palais de l'Elysée; M. Desvergnes' fountain with nymph figures, for a dining room in the Magasins de Louvre; M. Ducuing's robust caryatide, "L'Automne," for the Palais de Sorrento; and M. Graf's fine bas-relief "Les Arts," for the façade of the new museum at Clermont-Ferrand. Among other striking works are M. Jean Boucher's "Devant la Mer," a nude group composed on very severe lines, and M. Carlus' monument to Pierre Vaux. Among works which attract by pure beauty apart from any special idea are M. Lemaire's "Offrande à l'Autel d'Amour," M. Levasseur's "Nymphe à la Source," and M. Thivier's "l'Ivresse," a figure slumbering in the recess of a rock. M. Roussel shows a bas-relief recumbent figure as a monument to Larroumet, with Paris in low relief as a background; M. Moreau-Vauthier exhibits one group only of a projected great monument to Peace, full of splendid meanings and prophecies; realism is recognised in M. Dieterlé's group of men pushing off a boat, Gérome's "Ouvrier Metallurgiste," and M. Boverie's colossal figure of Camille Desmoulins mounting on the tavern chair to make his celebrated harangue; while the delicate humour possible in sculpture is illustrated in M. Blondat's mischievous little "Amour" perched on a column (purchased by the State) and in his charming "Enfants et Grenouilles," three little nude children seated on the edge of a fountain basin and laughing at the frogs. But we could fill another column with notes of things that are all more or less worth looking at. It is a remarkable spectacle.

LIVERPOOL SCHOOL OF ARCHITECTURE AND APPLIED ART.—The special art scholarship of 60*l.* given by the Liverpool Education Committee has just been awarded to Miss Phœbe G. M'Leish, of this school. The scholarship is tenable for one year at London or some art centre on the Continent. Miss M'Leish has been a student at the School of Architecture and Applied Art of the University of Liverpool for the last four years, and has held the municipal 30*l.* scholarship, besides gaining other prizes.

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NOTES.

"Structures" in Advance of Building Line.

THE case of the London County Council *v.* The Illuminated Advertisements Company, decided by the Divisional Court last week, raises a question of some importance under the London Building Act, 1894. An information had been laid against the respondents under sections 22 and 200 (3) for erecting or bringing forward a structure beyond the general building line without the consent in writing of the Council. The "structure" in question was an advertisement frame containing advertisement cases. The cases were supported on wrought iron supports passing through the front wall of the building, and the cases projected 10 in. out from the wall, which was 14 in. less than the projection of the cornices. The magistrate found that these cases and the supporting frame were not "structures" within the meaning of the Act, but were mere excrescences removable at will, and he held that they could not amount to an infringement of the Act by constituting a bringing forward of the building. The Divisional Court upheld this finding, but Mr. Justice Wills dissented and expressed an opinion that these cases formed part of the building as long as they remained annexed to it. It is to be observed that there are other sections of the Act which seem to have a more direct application to such excrescences or projections as these cases; for instance, section 73 is directed to "projections" other than shop windows, copings, water pipes, string courses, cornices, etc.; but in the case of Hull *v.* London County Council this section was held only to apply to projections in the nature of architectural projections or decorations, and to have no application to a wooden case attached to the external wall of a building by iron brackets and used as an advertising sign; and no doubt this decision was the cause of the present information being laid under a different section. The Lord Chief Justice has now expressed some doubt as to the correctness of the decision in Hull *v.* London County Council, so another case may soon be carried to the Court of Appeal to determine the real application of section 73.

Legal Rights of Sub-lessees.

THE case of Gray *v.* Bonsall, reported in the Law Reports of April, is one to be noted by underlessees of house property. The decision turns on section 4 of the Conveyancing Act of 1892, which was passed to afford underlessees relief when the lessee was enforcing a right to re-enter upon the premises in consequence of a breach of covenant on the part of his lessee. Attempts have been made to whittle away the effects of this section by arguing that its intention was merely to extend to underlessees the benefits already conferred upon lessees by the Conveyancing Act of 1881; which Act, however, did not afford relief from forfeiture on the breach of certain covenants such, for instance, as breaches of covenant to pay rent or not to sublet or assign the premises. The present decision makes it clear that no such limitation is to be placed on the Act of 1892, and it thus affords some security to underlessees, who otherwise might have had no relief or at any rate could only obtain relief in a more cumbrous form of legal proceeding than that provided by modern statutes for breaches of covenant on the part of persons for whom they are not responsible, and over whom they have no control.

Steam Turbines in Electrical Engineering.

THE paper by Messrs. Parsons, Stoney, and Martin on "The Steam Turbine as Applied to Electrical Engineering," which was read to the Institution of Electrical Engineers last week, is one of very great merit. The historical part is most interesting, and the conclusions the authors arrive at are obtained by rigorous reasoning. It was stated that up to the present time there were turbines of the Parsons type aggregating 800,000 horse-power at work in England and on the Continent, so that the steam turbine has now become a most formidable rival to the best reciprocating steam engines. Generally speaking, increasing the speed of a dynamo increases its output, and so high-speed dynamos are more economical than low-speed machines. The Parsons form of turbine is specially suited for the direct driving of high-speed dynamos. Apparently very little difficulty was experienced in devising bearings suitable for such high speeds, and unlike the cases of high speed reciprocating engines suitable for direct coupling to dynamos, there seems to have been no difficulty in connexion with the "whirling" and the consequent fracture of shafts. This may be due possibly to the very high speeds employed. Dr. Chree recently explained to the Physical Society how the period of the lateral vibration of a rotating shaft depended on the angular velocity with which it was rotating, and his proof shows that with very high speeds there is less risk of fracture of the shaft than at low speeds. Numerous tables are given in the paper showing the results obtained with the turbo-generators in use in various parts of the country. The results obtained are very satisfactory, especially when a condenser is used. A good vacuum is of great importance in a turbine, as the expansion of the steam can be carried down until the pressure equals the vacuum in the condenser. This cannot be done in a reciprocating engine, as the size of the low-pressure cylinder would need to be excessive. Owing to the high speed of turbines, carbon brushes cannot be used on the commutators of the dynamos. In practice brushes made of brass wire are found very satisfactory, but a special winding of the armature has to be employed in order to obtain satisfactory commutation.

A Suggested Use for Radium.

SOME recent radiographs made in Philadelphia by the aid of radium-bromide show that the emanations from this substance are able to penetrate cast iron without difficulty, and steel to a smaller degree. In one of these experiments, two pieces of cast iron and a piece of steel were tested, the cast iron being laid on a strip of lead—a metal almost impermeable to radium emanations. After an exposure of thirty-eight hours the negative was developed, and it then became evident that the rays had passed through both pieces of cast iron, and were intercepted by the lead, so that a distinct image of the latter was visible beneath the fainter shadow of the cast iron. Although less permeable, the steel had clearly been penetrated by the rays. These results are of considerable interest, and suggest the use of radium as a practical means of detecting flaws in metals, which are impermeable to the X-rays.

Architectural Education in Edinburgh.

THE Edinburgh Architectural Association has presented to the Edinburgh Town Council a memorial on the subject of the professional education of architects, and the present and possible future opportunities afforded for it in Edinburgh. After giving some account of the opportunities for education in London, the memorial goes on to approve of the Heriot-Watt College and the Edinburgh School of Art as worthy of support, though the former suffers from insufficient accommodation and presents no systematic course of instruction in architectural history and detail; history especially being mentioned as always a difficulty with architectural students in Edinburgh, "who are driven to expensive correspondence classes of doubtful value or to unaided private reading, in place of the systematic training given elsewhere. Architectural history and historic detail cannot be taught in the hurry of office work." The memorial goes on to recommend that, in any reconstruction of art education, the architectural school should be kept a distinct section of the general art school, under its own director, who should be an architect, and expresses satisfaction with the instruction given at the School of Applied Art under Sir Rowand Anderson. The memorialists consider that the system under which the School of Applied Art has been administered—direct control by practising architects—is by far the most efficient, and that an enlargement of this school on the lines indicated would be the simplest and most satisfactory method of supplying the needs of architectural education in Edinburgh.

Staple-inn, Holborn.

ADVERTING to the paper upon the history of the inn which Mr. T. Cato Worsfold read at a meeting of the London Topographical Society on last Saturday, we may mention that in our columns of February 20, 1886, and June 11, 1887, we published some measured drawings by Mr. Roland W. Paul and Mr. Paul Waterhouse, respectively, of details of the minstrels' gallery, the roof, and other portions of the hall of the inn which afford interesting examples of the elegant and piquant variations of Classic types that are found in English XVIth century Renaissance work. Mr. Paul Waterhouse prepared his drawings of the lantern bay of the roof after some necessary repairs had been executed in May, 1887, by Messrs. Holland and Hannen, under Mr. Alfred Waterhouse's superintendence, for the Prudential Assurance Company, for whom Mr. Alfred Waterhouse also repaired the

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woodwork of the Holborn front and removed the plaster covering over the old half-timber work. On one of the elaborately-carved corbels of the hall roofing is cut "1581: R. C." A peculiarity of the ornamentation should be noticed in the designs of the pendants from the lantern and of some large objects which, quite independently from the construction, stand upon the hammer-beams. The design and carving of those objects and pendants are similar to what we find amongst the native carvings in New Zealand and the islands in the Pacific Ocean. The windows contain some good heraldic glass—in the south bay are the royal coat-of-arms and motto of King James I. Stow, in his Survey, and Sir George Buc, in his history of the Legal University of London, record that the hall and certain other parts of Staple-inn were newly rebuilt for the then Inn of Chancery appertaining to Gray's Inn of Court. Whilst its name is derived, by common report, from the migration thither, *temp.* Richard II., of the Merchants of the Staple from New Palace-yard, Westminster, we read in the late Mr. Blott's remarkable book upon the chronicle of Bloomsbury that on that spot, on the hill's crest at Holborn Bars, stood Essex House, a fortress of Geoffrey de Magnaville, lord of Essex in William the Conqueror's day, and that the cognisance—a wool pack or sack—of the inn points back to much earlier times, when the fort or castle formed the official house and court of the King's Justiciary, Lord Chief Justice of England. Messrs. George Trollope and Sons purchased the whole real property of the inn from the ten or eleven "Ancients" in 1884 for some 80,000*l.*, and, having sold the southern portion, comprising No. 11, built in 1699, and Nos. 12-3, built in 1843 after Wigg and Pownall's designs in the late Elizabethan style, to H.M.'s Office of Works for 32,000*l.*, subsequently disposed of the remainder of the property.

Mr. Arthur Hughes's Exhibition.

IN the solitude of Mr. Dunthorne's small gallery in Vigo-street is hidden away a collection of forty-nine small oil paintings, mostly landscapes, which, if attendance at exhibitions went more by merit and less by fashion, ought to be one of the most frequented of the smaller exhibitions now open. These are some of the recent work of Mr. Arthur Hughes, all combining poetic feeling for the sentiment of nature with most conscientious finish and delicacy of execution. There is not a picture in the collection that is not worth attention, though some are more beautiful than others. Among those that more especially delighted us are "The Farm by the Sea" (20), "Summer" (22), "Spring" (27), and "Cliff Searchers" (41). The last named is a view over open sea from the top of a cliff, and is one of the most remarkable pieces of painting of the effect of sea under a breeze and in bright sunlight that we have ever seen. No detail is neglected in these small landscapes; as an instance, notice the careful painting of the horses, on such a small scale, in "Harvest" (19), and the foreground detail in nearly all the landscapes. The crow in the foreground of No. 13, a very careful study, seems however a little too large in comparison with the boy. Among the two or three figure pictures, which (as one need not say to those who know this artist's work) are as learnedly drawn and as carefully finished as the landscapes, is a figure of a beautiful young girl seated and looking upwards, under the title "Faith" (40). It is melancholy to find such a collection of pictures in an empty room; but this is a kind of art which does not appeal to the crowd. We were precluded by circumstances from mentioning the exhibition last week; but we hope some of our readers who care for art will go and see it before it closes.

Mrs. Allingham's Exhibition.

THE Fine Art Society have on view a collection of one hundred of Mrs. Allingham's water-colours, scenes of English country life and views in Venice. The latter, as we have before noticed, forms Mrs. Allingham's new departure. Her chief successes in the Venice series are not in the larger architectural scenes so much as in the small corners of Venice, where two or three figures and a fruit-stall form the main elements of the pictures. Mrs. Allingham has evidently been much attracted by the combinations of colour to be found in the fruit stalls, and has turned them to beautiful artistic use in such drawings as Nos. 15, 18, 24, 88, and others. The larger architectural scenes are effective rather in a landscape sense than in an architectural sense—which perhaps, after all, is what was intended; and in fact the painters who can treat architecture in such a manner as to combine pictorial effect with the kind of representation of the architecture that would satisfy an architect are few, and far between; generally speaking, either the picturesque or the architectural element has to give up something. There is an interesting and rather new view of the Campanile of Torcello (11). Mrs. Allingham's principal successes are still, and not unnaturally, in the class of scenes which she has been painting for so many years—English country foregrounds and figures; for as a rule these charming works are concerned more with small nooks than with wide sweeps of landscape. Among these are some which are equal to anything the artist has produced; we may mention especially "The Edge of the Beech Wood" (33); "A Dorset Cottage" (34); "Early Spring on the North Downs, Kent" (47); and "In the High Fields near Whitby" (59).

Landscape Miniatures.

AT the Goupil Gallery is a collection of seventeen paintings of Italian landscapes on ivory, as miniatures, by Mrs. Konody. Effectively set in broad white decorative mounts, with a very deep sinking, these are undoubtedly pretty productions, and show a great deal of delicate and painstaking work; but the conditions of painting on ivory seem to preclude anything but a very conventional treatment of colour in representing natural scenery, and it is not a form of art with which we have much sympathy—it is rather like reducing landscape to *bijouterie*.

The Queen Victoria Memorial.

LAST week, at the Royal Institution, Mr. M. H. Spielmann gave what was evidently a very interesting and attractive Friday evening lecture on the Queen Victoria Memorial; giving a number of illustrations of other memorials to royal personages, and of the designs submitted for the Queen Victoria Memorial. Mr. Spielmann concluded with the opinion, which we have frequently expressed, that the front of Buckingham Palace was the really incongruous feature of the whole; if there was a free processional road leading up to the palace, we wanted a fine palace to lead up to. That we refer to the lecture in this hearsay fashion is due to the fact that the editor of this journal, who had intended to be present, was delayed by a breakdown on a railway, and did not reach town till too late.

ARCHITECTURE AT THE ROYAL ACADEMY.—II.

IT cannot be said that any particular phase of current British work is adequately represented in this year's exhibition. It is, moreover, noticeable that a large proportion of the public buildings shown are unsuccessful competitive designs of no great merit, and occupy a large area of the limited wall space of the room.

The Hull Town Hall Competition is the chief example in this respect. We have already noticed two of the designs. Of the remainder, No. 1,492, by Mr. J. Hatchard Smith, receives considerable prominence in the matter of hanging. The design is typical of present-day competition work, in which a classic order, standing upon a rusticated ground story, is intended to proclaim the municipal nature of the work. We have drawn attention before to the popular treatment of pediments in current designs, but in this case the author outherods Herod in his minor pediments where both the segmental head and straight bed mould are broken off so short as to lose the idea of the feature altogether. The tower is too squat for what we are accustomed to in town halls, otherwise the composition is sound. This is a good drawing without a plan. No. 1,575, by Mr. Alexander Koch, is a mediæval treatment of the same subject with a high-pitched roof and flèche in the centre; the style, however, is less suitable than the use of classic forms, but this attempt is instructive as showing the contrast in the minds of architects.

The Cape Town University competition supplies two more designs, Nos. 1,567 and 1,657, neither of which, in our opinion, are of sufficient merit for hanging in the Architectural Room. Nos. 1,616 and 1,625 are charmingly drawn elevations and sections of a competitive design for the South Wales University, by Mr. J. Belcher, A.R.A.; the plan, however, is missing, and an intelligent appreciation of the conception is not possible. We may refer our readers, however, to our issue of January 23, 1904, when we published these drawings, together with plans. Designs for smaller municipal buildings are Nos. 1,464, by Mr. A. A. Carder, and 1,599, by Mr. J. A. Minty, both of which have characteristics which might usefully be employed in more important buildings of this class.

There are several exhibits of designs for municipal buildings actually completed or in course of erection. Following the order of the catalogue, we find the Public Offices, Hendon, by Mr. T. H. Watson (No. 1,439), rendered by a somewhat weak drawing, hung rather high. Red brick and stone for the walls, and green slates on the roofs, are materials which can be used to greater advantage than here shown. No plan is given, and the design does not readily convey an idea of the disposition of the respective parts. The side front takes an unpleasant line, which the space at disposal, as indicated on the drawing, does not appear to warrant.

As illustrating the range of treatment of any one kind of building in this country, "Public Offices, Camberwell" (1,460), by Mr. E. T. Hall, is instructive. A plan is not given, and our first impression of the drawing is that this is a Kursaal. The main front has a square

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tower-like projection at each end, an oriel window rises with a square head into the roof, while a small cornice is interposed between these features. In the middle of the return front a semi-circular stone bay window, with a conical slate roof, rises from a square brick projection. But for the massing of the materials this design would lose all its importance. The roofing is not broad enough in treatment, and the dignity of the whole is marred by the boundary wall and iron railing. Mr. Mayston's "New Town Hall and Fire Station, Sutton Coldfield" (1,522), is a convenient working scheme, published in our issue of April 16, under the authorship of Messrs. Mayston and Eddison; a re-arrangement of the plan, however, would have helped toward a better general composition. The tower is unhappy, both in its relation to the whole and in actual detail; the little turret rising behind a parapet is poor. No doubt the town hall is more effective from the rear, but one rather inclines to seeing those features which tell the purpose of the building, written on the "front page." The "Aldershot Town Hall and Fire Station" (1,496), by Mr. C. E. Hutchinson, has better detail, but is lacking in importance for a building of this character. Three distinct blocks are shown in the drawing, but there is no plan to explain the purposes for which they are used.

Designs for public libraries naturally appear on the walls. "The Passmore Edwards Library, Bow" (1,436), by Mr. S. B. Russell, is a small building of which the entrance part is shown in a clever coloured sketch. "Central Library, Hammersmith" (1,540), is designed by Mr. G. Sedger, and is probably an unsuccessful competitive scheme. The drawing is nicely treated in monochrome, although the broad surfaces of the brickwork would have been more telling if colour had been employed. Messrs. Sutton and Gregory are responsible for an excellent stone design for the "Free Library, Mansfield, Notts" (1,552), in which the scale and general detail are very satisfactory. A cornice and parapet run round the building, broken only on the entrance front by a pediment forming the gable end of the front roof; the tynpanum contains a large semi-circular arch, enclosing a large trophy, in which a shield bearing an inscription is supported by two allegorical figures. Two smaller broken pediments are also introduced on this front, the omission of which would remove the only disturbing element in this interesting design. No plan is given, but we are inclined to agree with Mr. Norman Shaw, who once said that an architect who could design a satisfactory elevation would probably make a good plan. "Library and Museum, Limerick," by Messrs. Swann and Wright (1,623), is a building which at once represents what it is intended to be—a library on the ground floor, and a museum upstairs—and this is a great point. Two slight sketch plans are given without scale and compass points, but they indicate that the plan is good. In criticising the design we should say that the news-room should have an approach nearer the main entrance to avoid noisy traffic interrupting the working of the other departments. Then, as a matter of detail, the use of flat pediments in front of the hipped ends of steeper roofs is false, and the result is not happy. The drawing is well rendered in lamp black, but we should have preferred colour as affording some idea of the materials, and we think it would give greater satisfaction to the authorities who direct the destiny of this section of the annual exhibition of British Art.

The "Kettering Free Library" (1,647), by Messrs. Goddard, Paget, and Catlow, is a nicely-drawn perspective view of a successful competitive design; the building was publicly opened a few days ago. On April 25, 1903, we published plans, elevations, and sections, but it may be interesting to recall that the lending library, which is really the basis of the scheme, is arranged upon the "open access" principle, with the stacks of books radiating from the delivery counter. The whole building appears to be excellently lighted, and should prove a simple working institution.

Of the remaining buildings of a public nature, "Design for Railway Station, Johannesburg" (1,474), is the most attractive. This is presumably a stone-fronted building, having an arcaded ground story, with a glass overhanging shelter, several floors of what appear to be offices—there is no plan—and an open colonnaded loggia with enclosed ends, at the eaves level. It is a very effective composition, in which the broad wall surface treatment is most valuable; there is, however, no feature or element to suggest a railway station. The clock tower, evidently a stone structure on the building line, rises from a semi-circular pediment out of the tiled roof, but no visible provision is made in the loggia for carrying the extra weight. The authors, Messrs. Baker, Masey, and Sloper, are also represented by a design for a "Bank in Johannesburg" (1,473). This is an interesting stone building, with an angle entrance. The use of an order, above which is an attic story, suggests an Italian influence which no doubt lends itself to the South African climate. When completed these buildings will go far toward raising the standard of taste in matters architectural in this modern town.

"St. John's Hospital, Leicester Square" (1,431), by Messrs. Treadwell and Martin, is a re-building of an interesting XVIIIth century house, the disappearance of which will be a material loss to the late Renaissance buildings of London. No doubt the old premises were found inconvenient for hospital requirements, and unsuited to the treatment of skin diseases, but we cannot say that the new stone front, which has heavily mullioned windows, is any advance upon the old double hung sashes. There is no plan shown with the drawing, and our inference is that none of the medical work of the hospital will be undertaken in the front rooms.

"Savoy Hotel" extension (1,603) is a disappointing design for so important a work, but it is only fair to presume, from particulars which we have at various times published, that the author, Mr. T. E. Collcutt, was hurried beyond all possibility of producing a great work.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Institute was held on Monday evening at No. 9, Conduit-street, under the chairmanship of Mr. Aston Webb, R.A., the President.

The minutes of the special general meeting and the annual general meeting were taken as read.

Deceased Members.

Mr. Alex. Graham, Hon. Sec., said it was always an unpleasant duty to announce the decease of any colleague, but that night he had to announce the death of three. The first was Mr. Norman Michael Brown, of Newport, an Associate, elected in 1887. The second was Mr. F. W. Tasker, elected an Associate in 1874 and a Fellow in 1903. Mr. Tasker was well known to most of them, and he believed they would all say that he ranked not only as a very estimable man, but as a very good architect. Many of his works were well known to them, and, although he was only elected a Fellow last year, they had reason to regret the loss of a man who was likely to have left a name behind him as an architect of distinction. Lastly he had to record the death of one familiar to all of them—Mr. G. H. Birch, who retired an Associate of the Institute a short time ago. Mr. Birch in recent years held the post of curator of the Soane Museum. He was a man who through all his life was an architect and a diligent student of architecture, and as curator of the Museum none, he supposed, who had held the post ever fulfilled the duties in a more excellent way than did Mr. Birch, and he was sure the trustees would have great difficulty in finding a man the equal in all respects of their late lamented colleague.

The Chairman said he wished to add something to what Mr. Graham had said. Two of the names which had been mentioned were very old friends of his own and of many other architects. Mr. Tasker, who only died on Saturday, very suddenly, was a Catholic architect, as probably they all knew. He (the Chairman) was a member of the Architectural Association and attended the classes of Design with him. He was a man of singularly outspoken views both on art and other matters. In those days in the Class of Design they used to criticise each other's works very candidly. He remembered very well Mr. Tasker amongst those from whom they used to hear the most candid criticisms, but he was a man who spoke his mind without malice and left no ill-will behind. He was fortunate in being the nephew of Miss Tasker, a most benevolent lady of the Catholic Church, and this gave him chances early in life of important commissions. One of the earliest of these, he believed, was the college in St. Charles-square, Notting-hill. At her death, Mr. Tasker had so proved his ability that to the end of his life he always had sufficient work from the church to which he belonged. He always looked upon Mr. Tasker as a man of remarkable ability and one of the men who could have built a cathedral had he had the opportunity of doing so. He left behind him a son whom he hoped would be able to succeed him. Mr. George H. Birch, who was buried on Saturday last, was also a great friend of himself and most of those who were in the Association at the same time. He was a man who gave himself from his earliest time to archæological pursuits in connexion with architecture, and perhaps the work he would be best known by would be the Old London which he created at Earl's Court. Of course, now, anybody could produce an Old London, but Mr. Birch was the first to do it, and it had never been so well done as by him. He belonged to a small coteric, of which he (the President) was also one, who for over twenty-five years met month by month at each other's houses to sketch and draw, and one could get to know a man well under those circumstances. He remembered well Mr. Birch explaining Old London, which certainly for architectural research and truth was most excellent, and at the time was entirely a new idea. As a literary man also Mr. Birch did a great deal of work, and perhaps the best thing of his was "Wren's Churches of the City of London," which was really an important work not only for the photographs, but for the very careful account of the different buildings which were represented. There was also a very picturesque little church at Dartmouth which he built; but owing to lack of funds it was never developed quite as fully as otherwise he was sure Mr. Birch would have been able to develop it. For the last ten years he had been the curator of the Soane Museum of which he (the President) was one of the trustees, and he would like to testify to the great obligation the trustees were under to Mr. Birch for the great care he always bestowed on that museum.

Board of Defence.

The Chairman said he was desired by the Council to make the announcement that the Council had decided after very careful consideration, and after the matter had been reported upon by a Committee, to institute a Board of Professional Defence, the object of this body being that when members of the Institute had legal difficulties of such a nature that might be of general interest to the profession to have a legal opinion upon, they would be able to come to this Committee and ask them whether they would assist them with counsel's advice as to the course they should adopt. In France architects had long had such a Committee, and it was thought time we in England should have something of the same sort. They had only that night decided to form this Committee of defence, and in due course there would appear particulars of the formation of the Committee, and the conditions under which members of the Institute would be able to apply for assistance.

The Rev. J. B. Lock, M.A., then read a paper, of which the following is an abstract, on

The Planning of Collegiate Buildings.

The author opened his paper by a reference to the colleges which have come down to us from the XIVth and XVth centuries, which were all built on much the same plan, the various parts being grouped round an enclosed court. The buildings were never more than two floors in height. To the lowness and narrowness characteristic of them the author attributed the beauty and feeling of rest that seems to pervade the old courts. The free admission of sunlight and air into the courts is also secured by keeping down the height of the buildings. When Dr. Caius enlarged Gonville Hall by building what is now called Caius Court, he bounded his court on the south side by a wall broken only by the insertion therein of his beautiful Gate of Honour, and in his statutes he expressly forbade the erection of any building which should completely enclose this court on the south side, "lest the air from being confined within a narrow space should become foul."

The old arrangement by which the buildings

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were in general only one room deep caused the kitchens, etc., to be placed at one end of the hall, which had the advantage of keeping the odours of the cooking to some extent out of the hall. At the kitchen end of the hall it was customary to have a passage going right through the building and cut off from the hall by a screen with a gallery above. In modern times the passage has in many cases become a thoroughfare leading from the old court to newer courts beyond, with the consequent disadvantage that all the kitchen service now passes across the busy thoroughfare. The position of the hall recently built at Girton College is obviously convenient. It is placed at some distance from the students' rooms, and is approached by the students from two directions, through an enclosed passage or cloister opening into the hall on its south side while the kitchens are placed in a separate building on the north side of the hall.

In the olden time the Master simply had his one or two rooms in which he lived, a bachelor. In modern times the master requires a good house with all the offices and belongings of a modern residence. So that the lodges of our day are either curious and interesting conglomerations of buildings gradually annexed or added by successive masters, or are brand-new modern mansions built on detached sites.

Coming to the Fellows' and Students' rooms, the plan of the sets of chambers or men's rooms in the ancient building was a very simple matter. The building was merely sliced up by the insertion of stacks of chimneys and wooden partitions, with staircases of one flight at the proper intervals. In colleges at the present day ranges of buildings containing living-rooms have to be divided up into sets, each set containing at least one sitting-room, a bedroom, and a pantry or gyp's room.

The following points should be borne in mind with respect to a set of rooms. Usually each set should be enclosed by a stout door called the oak or sport-door. The sitting-room should have some sunlight. The bed-room should not have less than 100 square feet of floor spacing, plenty of window space that can be opened, a place for the bed out of the draught, and a chimney and other means of ventilation. There should be provision for the passage of a current of fresh air through the rooms when the sport-door is closed; for this purpose the windows of the sitting-room and bedroom should not all face the same way. The author went on to consider how these points could best be obtained.

Economy of space in nearly all cases demands buildings of three floors and an attic, and the colleges nearly always ask that at least eight sets of rooms shall be provided on each staircase. The arrangement of four sets of rooms on each floor approached by one staircase would have many obvious advantages if a plan could be devised free from objections, but this is not easy. In the only instance the author knew of in which it had been adopted at Oxford or Cambridge the plan had so many hygienic defects that it could not be said to be successful. There was no possibility of a through ventilation of any one of the four sets of rooms, except through one of the others; the passages were without direct light or ventilation; the scout's hole was outside all the sets of rooms; the lobby was badly lighted and badly ventilated, and was larger than was necessary.

As to what is the best typical arrangement of sets of college rooms, the author had made a careful comparison of plans adopted in recent times at both Oxford and Cambridge, and had come to the conclusion that the plan recently adopted, quite independently, by Mr. Champneys at New College, Oxford, and by Messrs. Aston Webb and Ingress Bell at Gonville and Caius College, Cambridge, was one of the best.

Showing plans of St. Michael's Court, Caius College, the author described the arrangement. The building faces south-west towards a narrow court. The staircase is on the north-east, and is approached from the court through a passage about four feet wide. On the ground floor on each side of this passage is a set of rooms, of which the keeping rooms face south-west, the bedrooms north-east; the gyp-rooms also face north-east (a good aspect for a pantry). When the sport-doors are shut, the opening of a window in sitting-room and bed-room, one on each side of the building, gives excellent ventilation. The staircase is thoroughly well ventilated; with a window open on the staircase, air can blow right through the building from the entrance passage to this window. On the first floor, as the space over the entrance passage is available, the whole frontage to the south is at disposal for division between the two sitting-rooms. In the plan adopted at Caius College the space over this passage is all thrown into one room, making the rooms on each side of unequal size; at New College, Oxford, this space is divided equally between the two sitting-rooms.

Comparing plans of modern buildings, the author pointed out one or two objections to the arrangement adopted in the new buildings of Tree Court at Caius College. One is that the gyp-room opens directly on to the staircase landing and is not included within the sport-door. A more important objection is that the staircase has no independent through ventilation.

The rule that a court set aside for sets of rooms only should have no buildings on its south side has been very generally observed in recent additions to colleges at Oxford and Cambridge, so that these additions have usually taken the form of a straight line, or of an L, or of a U.

It has been the custom at Oxford and Cambridge in planning out the allotted space into sets of rooms to practically choose a certain arrangement and then repeat that arrangement on each staircase. In the recent work at Caius College, however, the irregularity of the site was such that uniformity of plan could only be attained by sacrifice of space, and the authorities had to determine how far irregularity of plan was objectionable. In the end they decided that it was desirable rather than otherwise, and the architects were instructed to give as much variety in size and shape (within certain limits) of the rooms as they conveniently could. The result in the new court at Caius is that there are hardly two sets of rooms out of fifty which are exactly alike.

The irregular site of St. Michael's Court is practically an L with an angle at the corner of about 120 deg., and the plan adopted by the architects seems a solution of the difficulty of how to deal with an L or U shaped corner, provided it is not a condition that all rooms shall be rectangular. To illustrate the advantages of the arrangement, the author showed this plan adapted to the first floor of the building in the corner of the Tree Court, Caius College, so that it could be compared with the existing arrangement. The new plan gives two sets of rooms, with sitting-rooms, each facing south-west, of very irregular, but not uncomfortable, shapes. The existing plan provides two sets of rooms which in size and shape are excellent, but one set has all its windows looking north. And as the building looks on to a narrow lane with high buildings on the opposite side, the rooms, notwithstanding their good size and shape, were not popular. The corresponding rooms on the ground floor were practically unsuitable for habitation, and were used as offices.

Three main points the author emphasised in the planning of college buildings—viz.: (1) the desirability of having some sunlight in the sitting-room in all cases; (2) the importance of it being possible to set up a through current of air through every set of rooms independently of the staircase; (3) the desirability of having a through current of air through the staircase itself. The plan recommended provided all these advantages in rooms facing south or east or west. The point raised as to the desirability of having windows in living-rooms on more than one side, applied with equal or greater force to all rooms intended to be used as chapels, halls, lecture-rooms, laboratories, or class-rooms.

In concluding, the author begged architects not to grudge a large share of attention to the use to which a building was to be put. He fancied he remembered reading a report of a speech by the President in which he advised architects not to put *all* they knew into a façade. He (the author) asked them to give a large share of their genius and experience to the planning of the building.

Mr. Basil Champneys said it was but a short time since he delivered himself on the same subject, but it was exceedingly probable that the audience of that night was an entirely different one. Mr. Lock, in his paper, had dwelt more upon the practical than upon the historical, but he, no doubt, knew as well as he (the speaker) did that the whole system of college rooms was absolutely transformed from that of the XVIth and XVIIth centuries. The old plan was that there should be one large room, where a master of arts and students slept together, and, adjoining this room, and generally opening out of it, were two small studies. A great many of these survived in the old buildings at New College. When that was the case a very small college would accommodate a good many students. Supposing that one of these sets took one master and possibly half a dozen students, there would be accommodation in the same building for six times as many as was the case as soon as each student required separate rooms. When that time came the large room was usually taken as the undergraduates' sitting-room, one of the small bedrooms was taken as his bedroom, and the other served as a gyp room. There were many college buildings surviving in which the old partitions remained the same as they were built in the XIVth and XVth centuries, and it was simply the uses of the rooms which had been altered. That change had, of course, affected the questions both of height and of size. In the old days they did not require to build upwards, as two floors were probably all they wanted, and the later buildings were for the most part confined to two floors and an attic. He believed that Mr. Lock said that the economists of the present day required three floors and an attic. If it was so, he was bound to say that he much regretted it. He had rarely seen three floors and an attic which did not look altogether too high, and he himself so far had been fortunate in persuading his clients never to go beyond two floors and an attic, and hoped in the future that he would be equally successful. In the paper he had read he had dwelt on that point, and mentioned one or two buildings which did not satisfy him from the æsthetic side. There was this practical aspect of the matter also that college servants did feel stairs very considerably. Only the other day the bursar of one of the colleges for which he was preparing certain plans pressed upon him the necessity of making the stairs easy because of the servants constantly complaining of the staircases. He most certainly hoped that the fourth floor would not be pressed on the architect in the future. With regard to the size of the quadrangle, he agreed that if they could leave the south side open it was of enormous advantage to the buildings, but they could not always secure a southern aspect for all the sitting-rooms. Where it was possible it was best to be done. With regard to the Masters' Court at Trinity College, Cambridge, he quite agreed that the size of the quadrangle was absolutely insufficient. He was one of the first occupants of these rooms when they were built. Fortunately, he had rooms which looked into All Souls Passage, and so he got plenty of light and air. There was a question which Mr. Lock did not touch upon, except indirectly, which, however, was a matter of some importance: whether fireplaces were a necessity in bedrooms. Personally, he had no very great belief in the ventilating power of fireplaces when there were no fires in them. He thought they were just as apt to work downwards as upwards, and when they worked downwards there was a sooty kind of atmosphere introduced which he thought would do rather more harm than good. Certainly, in his experience these fireplaces were rarely used, and he fancied they might be neglected. Nowadays, of course, they were not so absolutely dependent upon windows as they were, for they had many means of obtaining ventilation not known to their ancestors. There were a few little practical points he would like to refer to. First, with regard to the gyp rooms, as they called them at Cambridge, or scouts' holes, as they were called at Oxford. It was the tendency to make one fair-sized room answer for the whole staircase, instead of the little cupboard with a sink in it attached to each room, with no stove or anything of that kind. Lately it had been found useful to have a somewhat larger gyp room containing a gas or some other stove, the advantage of which was that when people did not have fires they could get hot water. Then there was the question of coal stores, which had also been a matter of discussion lately. Where there was not much spare space it was a somewhat difficult matter to get storage for the undergraduates' coal. He felt that the best solution of the difficulty was for a rate for coal to be charged, and that it should all come from a common store. That system prevailed in many colleges with regard to the electric light and so on. Mr. Lock did not touch on the

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question of baths, but he found they were more and more needed. The principal point, however, which he wanted to refer to, was the staircase arrangement. He had lately had to meet the problem of getting the largest possible number of rooms into a very limited space, and he found that he could get this far better by making the staircase altogether external to the main block, and of the spiral type. He had not done it yet, but he was going to do it for the first time, and would be able to find out how it worked. He found, however, that on one side he would be able to save 11 ft., and on the other side 22 ft. by adopting this plan. The space was excessively valuable, and in that connexion at least there were advantages, and he did not see at present that there were any necessary disadvantages attending that plan. However, he spoke as a person about to embark on an experiment.

Mr. E. S. Prior expressed the extreme pleasure it gave him to come there, one reason being that they, as architects, had heard a lay speaker. They had heard someone outside their own particular view, and he felt that it was very necessary for them to consider that there was another view outside their own as architects. He attended a congress of architects some years ago, and a speaker there eloquently, and at great length, put forth how the architect was the beginning and end of practically every function of modern life. He thought at the time that was probably going a little beyond what was correct, and it seemed to him, in fact, that the architect came in subsidiary to the user. The architect was contributory, he would not say to the intelligence, but contributory to the imagination necessary to put the users' intelligence to the purpose for which it was intended. He supposed the earliest collegiate buildings in the British Isles were the collection of hermits' cells known as oratories, which consisted of a bell-shaped chamber, with a seat on one side on which the occupant passed his days. The development had gone on day by day until they came to the present. The XVth, XVIth, and XVIIth centuries had all contributed their share, and now he thought the collegiate building had shifted into something different. It had really become a collection of flats. Mr. Lock had said it was best to have the south side of the court open, and there they got to flats, and another point brought out was the common gyp rooms with stoves. There again they drifted to the new order. If that was so, and they were necessarily drifting into something else, why should they go back to the picturesque time and of necessity make their new college buildings in a style no longer fitted for their requirements? They tried to produce the effects of the old style, but it could not be done, because modern requirements compelled different proportions and size. Therefore he felt that they ought to discourage the collegiate style in college buildings if they were going to be built merely for the uses for which they were intended.

Mr. Locke (Secretary) asked how, in the plan shown by Mr. Lock, the bed maker managed to arrange the effects of the different undergraduates. When he was up he used to use the gyp room of another man on the same landing, which opened immediately on to his, and, consequently, this man's butter and cheese, and whiskey and brandy, and beer were all mixed up inexplicably with his own.

The Rev. J. B. Lock, in reply, said that when they were planning St. Michael's Court he had to go to Oxford for the purpose of going over all the new buildings which had been erected in the last fifty years, and in Mr. Bodley's building at Magdalen he met a scout on the staircase who was taking some things to his rooms below. He asked the scout, "Would you prefer to have on the staircase a sink and wash-up place, or do you prefer to do everything down in your own room?" And the scout said that he much preferred to take things down to his own room. St. Michael's Court was a building of five stories—a basement, three floors, and an attic—and at the bottom of the staircase there was a little room in which there was a sink, and arranged so that the bed-maker always had a fire, which he thought was a very great advantage. On the staircases were certain cupboards, which they called gyp rooms. These were intended to afford accommodation for sorting out the butter and the brandy, and other things which the undergraduate liked to keep for himself. Mr. Champneys had touched on one or two matters which showed him that he had thought a great deal about the planning of college rooms, and he had spoken of the hard work it was for the bed-maker to go upstairs. Their architects suggested that they should have wooden treads on their floors, and he could assure them that the bed-makers thoroughly appreciated that. Their staircases were very ingeniously made in a way he had never seen before, of cement covered with oak treads. On the second floor was put a waste, so that the bed-makers had not to carry it downstairs. With regard to the doors between the bedrooms and sitting-rooms, he did not think it was necessary for ventilation, because the two doors were so close together. In their rooms they had an opening near the ceiling, and in every bedroom there was a fireplace, and with such an arrangement as that he thought that fireplaces were a good thing, as there was a circulation of air if they had warmth in a room. With regard to the storage of coals they had solved that problem; the only difficulty being as to the size of the coal-box to let the coals down. The question of baths was a very pressing one, and a committee had been appointed at St. Michael's Court to see how they could best be provided. He believed that the solution would be to have two or three shower baths with dressing-rooms. All those little things required a great deal of thought, and, as Mr. Champneys had shown, it required experience properly to solve the problems.

Mr. A. W. S. Cross, in proposing a vote of thanks for what he described as a most able paper, said that in the Rev. J. B. Lock they had not only a scholar who, through a series of mathematical works, had materially assisted to lighten the burden of many an unfortunate undergraduate in his struggles with the inevitable but to him highly unnecessary examinations which often embittered his university career, but they had also a gentleman to whom all members of his college owed a debt of gratitude for the able and satisfactory manner in which he had administered its finances for so many years past. Mr. Lock had shown them that evening that if he had directed his attention to architecture he could scarcely have failed to attain high rank in one or more of its branches. He (the speaker) had inspected the new building with which their President had enriched the town of Cambridge, and he wished that the deep interest that Mr. Lock evinced in every detail of the arrangements were more often displayed by an architect's client.

Mr. H. G. Ibberson seconded the vote of thanks, and referred to the practical qualities which Mr. Lock had displayed in the management of his college. There were certain remarks made with reference to dealing with old courts, that he would like to refer to. Mr. Champneys had suggested that the staircases should be placed projecting into the court rather than into the building, but it did appear to him that from an æsthetic point of view that would break the repose of the façade, and from a practical point of view it would break up the air spaces in the court and make the circulation unsatisfactory.

The Chairman said that they had had a most instructive evening, and were very much indebted to Mr. Lock. Mr. Jackson, who had had so much experience of buildings of this class, had written to say that he would have much liked to have been present, but Mr. Jackson had been ill, and although he was glad to say he was better, he was not yet able to come out at night. They all appeared to agree with Mr. Lock that the height of the buildings should be reduced to two stories and an attic. He regretted that in the particular case in which Mr. Lock was concerned he had had to fix the height at three floors and an attic, and it only showed the difficulty of carrying out in practice the principles they held in theory. With regard to the quadrangle being surrounded on three sides and open to the south, he ventured to say that that was not quite sufficient to secure the through draught which Mr. Lock was anxious for. With regard to the staircase, for instance, if they only had a window at one end they did not get a through draught, and he was afraid that with a quadrangle open only to the south they would not get a through draught. They had a well-known example of that when driving in a hansom cab, where if there was a wind, they sometimes found the doors fly open with the pressure created by the air in the cab. Really the only way he thought, if they wanted cross ventilation, was to have the angles open also, and a well-known example of that was the quadrangles of St. Bartholomew's Hospital at Smithfield, which had existed a great many years longer than it would have otherwise done owing to the angles being open and a through circulation thus secured. With regard to gyp rooms, neither Mr. Bell nor himself had had the advantage, unfortunately, of being University men, and they had, to some extent, to find things out. They were rather surprised when they came to close quarters, to find that although there were gyp rooms in Cambridge, yet there was no such thing as a gyp; he believed they called them bedders. Now it seemed to him that one good room down below was the best arrangement at the present time, with a little pantry attaching to each floor. He was sure they all agreed as to aspect. If a young man had to live in a single room for a good many hours in the day the room ought to have some sun. Pembroke College and those beautiful buildings which Mr. Gilbert Scott built, he happened to know very well. Those keeping rooms faced the north, and it was the only thing one had to find fault with. They went on to the staircase and found it all sunny, but in the rooms they found it cold and somewhat depressing. As to the details of the gyp rooms—the coal boxes, etc., Mr. Lock had been good enough to refer to those. He need hardly say that all those ingenious contrivances were absolutely Mr. Lock's, and if everyone had his due, certainly Mr. Lock's name should have been on that plan as well as his own and Mr. Bell's, for Mr. Lock settled the general disposition of the rooms and supplied those details. He entirely agreed with Mr. Prior that the architect's business was not entirely to override his client, but to work with him, and he thought that all reasonable architects were only too glad to have the suggestions and help of those who were going to use the building, and who must very often know the requirements better than the architect. Certainly in this case Mr. Lock was the architect of the greater portion of these arrangements, and he thought the part he was responsible for had turned out extremely well. He thought that colleges ought certainly to have baths, and he was glad to hear that night that in St. Michael's Court they would be provided later on. He thought that was a thing that ought to be encouraged amongst young men, and also that there should be hot water on each floor so that they would not have to boil all the water in kettles to the great danger of the undergraduates and the building generally. Also there were certain sanitary conveniences which ought to be provided in all university buildings. At the end of his paper Mr. Lock had rather "let fly" at architects by asking them not only to consider the outside of the building, and he ascribed a saying to him (the Chairman) that architects put everything they knew into the façade. It was a curious thing that the public should think that architects thought only of the front and took no trouble about the inside. The curious thing, however, was that if they asked architects at the present time, most of them would say that the tendency of architects nowadays was to think too much of the inside and not enough of the front. He was quite sure that the development of planning at the present time had gone more rapidly forward than the development of the character of the achitectural work they carried out. He hoped that Mr. Lock would take it that they did think of the inside, and that they quite agreed with him that a building to be worth anything must be a building adapted for the particular purpose for which it was to be used.

The resolution was then carried.

Board of Education.

The Chairman said he had to announce that the Council had that day appointed a Board of Education, the object of which was to endeavour to draw up a report which should co-ordinate and utilise the means of education throughout the country for the benefit of architecture generally. In due time he hoped that report would be laid before the Institute, and that it might lead to good results, as he believed it would.

The Next Meeting.

The Chairman said he had to announce that the next meeting would be held on June 6, when the results of the annual elections would be announced, and afterwards the adjourned discussion on plenum ventilation would take place. Previous to the meeting, a special general

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meeting would be held, at which the following motion would be proposed from the chair:—"That the following words be added to end of the first clause of by-law 3—'After December 31, 1906, every person desiring to be admitted a Fellow shall be required to have passed the examination or examinations qualifying him as an Associate, always providing that in exceptional circumstances the Council, by an unanimous vote, shall have power to dispense with such examination or examinations.'"

THE ARCHITECTURAL ASSOCIATION:

ANNUAL DINNER.

THE members' dinner of the Architectural Association was held on Friday evening last week at the Criterion Restaurant. Mr. H. T. Hare, the President, presided, supported by Professor Beresford Pite, Professor Hulme, and Messrs. Maurice B. Adams, Cole Adams, R. S. Balfour, E. Guy Dawber, Leonard Stokes, Max Clarke, T. Costigan, J. S. Gibson, E. Greenop, W. J. Locke, Louis Ambler, A. H. Belcher, Arthur Bolton, C. H. Brodie, H. G. Collins, Arthur Keen, Burke Downing, Banister F. Fletcher, Neil Forsyth, F. Hooper, W. H. Jamieson, H. J. Leaning, W. G. B. Lewis, F. Lishman, H. Lovegrove, H. P. G. Maule, A. E. Munby, J. Murray, G. Nicholson, H. Passmore, E. H. Payne, W. A. Pite, J. MacLaren Ross, H. B. Ransom, T. Sudsuki, W. W. Scott-Moncrieff, C. J. Tait, H. Tanner, H. Tanner, jun., T. H. Watson, W. Wonnacott, T. C. Yates, D. G. Driver, Secretary, and others.

The toast of "The King, Queen, and Royal Family" was proposed by the Chairman, who said that now that the Association occupied the Royal Architectural Museum in Tufton-street they were in a sense under Royal patronage, and that, consequently, the toast would appeal to them even more than it ordinarily would.

The toast having been suitably honoured,

The Chairman next proposed "The Royal Institute of British Architects," coupled with the name of Mr. W. J. Locke, Secretary of the Institute. The Chairman said that a large number of those present that evening were members of the Institute, and those who were not and were not visitors were, he was sure, desirous of becoming members. In those circumstances, they would drink the toast with the greatest enthusiasm.

Mr. Locke, in response, said that if he responded truly for the Royal Institute of British Architects he would take up rather too much time, and, as speeches were to be short, he would limit his remarks to what concerned the Association. He had had the pleasure of going over the new premises of the Association, and, when he gazed around at the magnificent space the Association had at its command—at all the comfortable rooms and arrangements, "replete with every modern convenience" (to use the sacred and beautiful words of the estate agent)—and when he returned to No. 9, Conduit-street, and saw how cramped the Institute was; when he looked at the two lavatory basins, and compared that with the lavish arrangements at Tufton-street; and when he remembered that whenever an extra roll of drawings came to hand it required an anxious consultation between himself and his staff to know where to put them, he was filled with envy—a noble envy, an envy that stimulates; and he hoped that the Institute would some day have a palace that would vie with that now secured by the Association.

Mr. J. S. Gibson, in proposing the toast of "The Architectural Association," referred to the frank and hearty manner in which the Association opened its doors to all the architectural students who came to London, either to perfect their education or, if they came from the far north, to teach the poor southerners something they did not know. There was one thing which always endeared the Association to him, and that was the fact that it opened its doors to men of all nationalities, and it made them all welcome and, as far as that was possible, treated them all impartially. One could always tell the sprinkling of men who came from beyond the Tweed by their—he was almost going to say by their works, but, unfortunately, as they came to a land where brick was of paramount importance, and the building by-laws seemed to be enacted for the express purpose of stultifying any capacity which a Scotsman had got, it would require a century or two to get over these difficulties, and so their work was not what it might be. His experience of the Association had been a very pleasing and a very nice one, and he was quite sure that all those men who were coming into its ranks, from whatever end of the world they might come—all those men who came to better themselves and to learn what they could—would find in the Association all the facilities and all the attractions they required, and would probably form friendships and acquaintanceships which would be of great use and good to them at the time and of great value to them in after life. The Association took one out of oneself, gave one a chance of knowing other men, and of realising that there were other aims and objects in life than their own, and so broadened the sympathy of a man in his outlook upon the world and on work. On that account, and for other reasons, he thought they ought to think well of the Association and wish it every prosperity in its new home. He was delighted to think that the Association's recent move had at last awakened the Institute and had filled them with feelings that would inspire them to obtain something better than two lavatory basins.

With the toast was coupled the name of the Chairman, which was received with musical honours.

The Chairman, in response, said he thought they must congratulate themselves on the result, so far, of their new departure. They had many very good friends to thank for what had been done. In the first place they must not forget the very important work which was done by his predecessor, Mr. W. H. Seth-Smith, for it was largely due to that gentleman's energy and initiative that the Association was in a financial position to avail itself of the offer which was made by the Council of the Royal Architectural Museum through Mr. Maurice B. Adams. If they had not had the funds which Mr. Seth-Smith's energy had supplied them with they would, he was afraid, have been obliged to decline the offer. The best thanks of the Association were also due to Mr. Maurice B. Adams for the part he took in bringing the matter to a head and also to Mr. Leonard Stokes for the manner in which he had rendered the premises suitable to the needs of the Association. Most of the older members had studied at one time or other at the Royal Architectural Museum, and those who had done so would remember the dismal and depressing place it was. So much was this the case that if they had not possessed a considerable amount of enthusiasm they could not have gone there to work; but, under Mr. Stokes's guidance, that effect had quite passed away and the place was totally different, and, instead of having a depressing effect on students, it would have quite the contrary effect and the place would be a distinct encouragement to study, as it ought to be. Although they had entered into possession of these premises, and were very happy in having done so, there was an unhappy fact to be remembered—they were under a considerable burden of debt. He did not want to enlarge on this, because he had spoken about it so often lately, but he hoped that every member would feel that he had a part in what had been done and that he shared in the responsibility; if every member felt that, and acted accordingly, there would be no debt at all. The Association was going stronger than ever, and that dinner was a record one in regard to numbers and enthusiasm. The scope of the work of the Association was constantly enlarging, and they were continually embracing more and more of the profession. They had now a large number amongst their members of the most prominent architects, and many of them took an active part in the direction of the Association. The present position of the Association gave the greatest promise for the future, and he thought that their work would develop into something much more important than it had ever been before, and would have the greatest influence on architects and architecture of the future. The day school was an unqualified success, and the work done there gave promise that the students who passed through the course of training would give proof of much greater ability and more complete equipment than had been the case with students in the past. He looked forward to the time when the school would become one of the most important schools in England, and he had every confidence in thinking that the success of the Association was permanently assured.

Mr. Arthur Bolton then proposed "The Visitors," and, in doing so, referred to the presence that evening of Mr. Sudsuki, from Japan. Mr. Sudsuki seemed to him to embody just those qualities which had made Japan so successful. He had devoted more attention to the day school than any visitor during the two years that he (the speaker) had managed the school, and he was most persistent in his inquiries. The attention Mr. Sudsuki gave to the methods they were following seemed to be the same that Japan as a nation gave to naval and military affairs. As the day school had been mentioned that evening he might say that he looked back with amazement to his activity during the time when he was in charge of it. Up to that time he had never conducted a class or taught anything at all, but the Committee were pleased to think that he would be able to start it. He was not sorry that it was no longer his duty to lecture twice a week, for he found it sufficiently hard work, though it evidently did not injuriously affect Mr. Maule, who seemed, in fact, to flourish upon it. There were several members of the day school present that evening, and the Committee was glad to see students who had just joined the Association taking part in an event like the annual dinner. It was a good thing for the students to get to know the older members of the Association, for it would add to their interest in what was being done. The new premises would be an enormous impetus to the work of the school; when parents and guardians went to Tufton-street and saw the students at work in their present premises they would think that they could not do better than send their boys there. With the toast he coupled the name of Professor Hulme, one of the lecturers. The debt the Association owed to their lecturers and instructors was very great. All the work of the teachers of the Association could not be reckoned in the actual salaries they received, for he knew that they gave their ungrudging attention and did all they could for the students. Among the staff of teachers he might mention Messrs. Lewis, Green, and Jenkins, of the evening school, and Messrs. Squire, Dods, and Douglass of the day school, and, of course, Mr. Maule, the master. The work of the A. A. staff could not be too highly appreciated. He had not a long list of visitors to propose as the toast, but he was glad that they had so many architects and architectural students among them that evening. As long as the Association continued to command the confidence of the profession it would do well, whatever it took in hand.

Mr. Sudsuki briefly thanked the Association for the facilities which had been accorded him in his work, and said he was very grateful to the teachers and others. Japan needed improvement in many things, and he believed that many of his architectural friends would come to England to be taught, just as the navy of his country had been taught. He congratulated the Association on its prosperity and hoped it would be continued.

Professor Hulme having suitably responded,

Mr. H. P. G. Maule proposed the toast of "The Press." The Association was most indebted to the architectural Press, the standard of which went on rising year by year. The illustrations which appeared from week to week formed one of the chief means of studying contemporary work, and those illustrations went on improving, which no doubt affected and tended to improve draughtsmanship. There was a great gulf between the architectural and the non-architectural Press, which was very noticeable when the daily Press had to describe a famous public building. With the toast he coupled the names of our representative and Mr. Raffles Davison.

Our representative having responded,

Mr. Davison said that the Association embodied youth and the magnificent qualities of "youth, arrogance and insolence." As architects they should cultivate catholicity of mind and tolerance towards their *confrères*.

The proceedings terminated soon after.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS.—Our account of the first summer visit of the Architectural Association to Moor Park, Rickmansworth, is held over until next week.

BALTIMORE TIMBER TRADE.—According to a report received at the Foreign Office from the British Consul at Baltimore, there was a good demand throughout 1903 for all kinds of lumber, especially kiln-dried North Carolina pine and Georgia pine. Quartered oak, poplar, and other hardwoods were also sought, but the supply was not at all equal to the demand. The exports, principally to the United Kingdom, amounted to 58,346,000 ft., and were within 190,000 ft. of the quantity shipped in 1902.

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THE SURVEYORS' INSTITUTION:

LONDON STREETS AND STREET TRAFFIC.

AN ordinary general meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, Mr. A. Buck, President, in the chair.

The minutes were read and confirmed, and Mr. Percivall Currey, Hon. Secretary, read a list of donations to the Library and the Library Fund.

On the motion of the Chairman, a vote of thanks was passed to the donors.

Mr. Currey also announced the result of the recent examinations.*

The scrutineers for the forthcoming election of officers having been appointed,

Mr. Howard Martin resumed the discussion on the paper recently read before the Institution by Mr. Thomas Blashill, entitled "London Streets and Street Traffic,"† He gathered that on the whole Mr. Blashill was of opinion that the enormous expense of recent street improvements would, at any rate, delay others of a very ambitious kind. He (the speaker) was afraid that was true, but some of the schemes which Mr. Blashill mentioned might be usefully begun, if not completed. He supposed there could be no two opinions about the advantage of Colonel Hayward's scheme for a new street from Holborn Viaduct to Whitechapel-road, but he feared that the great expense would render that improvement impossible, at any rate in our time; but he thought that a great improvement would be the straightening and widening of Gresham-street. Cabmen insisted on using that road, and its widening would be very useful. As to the expense of improvements, he thought that local authorities, when getting their bills for street improvements through Parliament, might get a clause inserted by which all disputed cases of compensation should be settled by arbitration instead of by jury, for he thought that that would diminish the cost. He regretted that the coal and wine dues were abolished, for they provided a steady annual income, raised in a way which nobody felt, which provided for improvements; now the necessary money had to be provided in ways which were felt, and which operated oppressively. In speaking of the removal of obstacles, Mr. Blashill spoke about organisation of work done to the surface of the streets. He (the speaker) did not think it would be any improvement to entrust the whole of such work to the Borough Councils, because, so far as his observation went, the Borough Councils were the worst sinners themselves. It was not long since Fleet-street and the Strand were left in peaceful repose during the holidays when road work could have been undertaken at a minimum of inconvenience, and just at the end of the holidays, when the full tide of business was about to resume, the roads were taken up for repair, and the public were put to the maximum of inconvenience. It occurred to him that a single licensing authority might be appointed to whom applications should be made by those who wanted to remove the surface of the streets, and that authority should take pains to see that while the work was in progress any other work which was done periodically should be done at the same time. He thought that Mr. Blashill rather under-rated the practical efficacy of foot crossings by tunnels or bridges for relieving the congestion of traffic. Some of the worst congestion of traffic arose from stopping vehicles to allow people to get across, and there were few people who would not prefer to go down steps to a tunnel or up steps to a bridge, rather than wait while the traffic was stopped or run the risk of crossing while it was in motion. He thought we should gain enormously in the matter of reducing congestion of traffic, if tunnels or foot-bridges were provided. He did not think that there would be much relief by the use of motor carriages, and, as to police regulation, he did not think it would often be practicable to police-regulate the traffic to such an extent that quick traffic could be kept on certain streets, and slow traffic on others. He did not think the public would stand being so regulated. As to leaving vehicles beside the footways in front of trade premises, that was a very great obstruction to traffic and foot-passengers, but it was a practice that had continued for a long while, and if it were suddenly altered it would work a very great injustice to the owners of property, and would considerably diminish the ratable value of property and the incomes of the local authorities in consequence.

Mr. W. Woodward said that some of the improvements which had been carried out in London were very good, but they must all regret the Charing Cross-road improvement, because it did not lead in any direct way to the east, and was altogether a very unfortunate improvement. As to empowering the Borough Councils to do all work on the roadways, and to charge the cost to the parties concerned, he was surveyor to the Crown Estate Paving Commissioners, and in reference to Regent's Park, for thirty years at least it had been their practice to do such work through their contractors, the owners paying the cost. St. Pancras being a paving authority and also an electric light authority, the paving was done by them, but to the satisfaction of the Surveyor of the Commissioners. He did not see why that practice should not be extended. A great deal of obstruction and loss of time resulted from the want of supervision on the part of the engineers or surveyors who superintended the opening up of roads—workmen were allowed to congregate and talk and do the least work and take the longest time they could. As to the vexed question of paving roads, in the little district to which he had referred he had paved the roadway in the true macadam style. Instead of using large pieces of granite he did not use any that would not pass through an inch and a half sieve, nor did he mix it with sand or hoggin. The granite was put on the roadway and well watered and rolled, and in the end fine siftings of granite were put on. The result had been that his roadway, done in the true macadam style, had worn infinitely better than the roadways done in the style of the Borough Councils. As to shopkeepers projecting their counters, the Westminster City Council recently summoned a bookseller for projecting his stall on to the footway, but the most extraordinary thing was that theatres and music-halls were allowed to occupy the public way as they did by the visitors to their buildings. No sort of attempt was made to prevent such obstruction, and it was a monstrous thing that pedestrians should be forced into the roadway as they were when the remedy was so simple, *i.e.*, that the theatre owners should be made to open their buildings earlier, and pay for the necessary supervision. The Westminster City Council summoned a bookseller for his poor little 18 in. projection, and yet allowed yards and yards of human obstruction! As to the obstruction caused by vehicles, that again was almost entirely due to the absence of control on the part of the police. The police had immense powers over the traffic of London, but they did not exercise them. He agreed that the more we could minimise tramcars in London the better. As to the cost of improvements, he thought that a good many improvements were so costly because poor people were turned out of their homes long before the authorities were ready to undertake the improvement. This was certainly so in the case of the L.C.C. in Drury-lane and elsewhere. He thought that bridges might be advantageously placed in certain thoroughfares of London, and that they might be made architecturally picturesque; people would prefer to walk over a bridge than have to wait for the traffic in order to cross the road.

Professor Robinson said that in regard to the surface of roads, there was a great field open for improvements, and he believed that in the immediate future we should have some means of making the surface of our main roads sufficiently smooth to answer the purpose of motor traffic—not the motor traffic of the present, for that traffic was in its infancy now. By improved methods of traction, improved methods of storing energy, we should, with improved road surfaces, be able to substitute motor traction for horse traction in our main roads. There was reason to hope that in the near future the surface of roads would be greatly improved, and that we should get a road surface which would be more likely to serve the purposes of the future than the present scandalous methods. The present wood road was often a switchback, and, from the point of view of health, our present-day roads were, in dry weather, very unhealthy. Last year the rain, with all its inconvenience, produced an improved health rate, and medical men said that that was because the filth of the roads was not blown about and breathed by the people.

Mr. J. Douglass Mathews said that so many schemes for the improvement of the traffic of London had been suggested, and the expense of the improvements proposed was so enormous, that he was rather surprised that there had been no suggestion to remove London altogether and start afresh some thirty miles away. It might in 100 years time get a convenient city, but it would not be our interesting London. We must, as our forefathers had done, widen our streets as traffic increased. It was very nice to talk about streets 100 ft. wide running north, east, south, and west, but he was afraid that if they were provided the business of London would suffer, and that the cost would be very great. Such improvements meant money, which would have to be found by the ratepayers now that the coal dues were abolished. What we want is more direct streets. The old roads are the main roads of the present day, and, with few exceptions, they were well devised. If a little more care and attention were given to widening streets, great advantage would result at a comparatively small cost, for there was a great difference between widening a road and constructing a new one. By constructing new roads, a number of people were dispossessed, and it took a long time for a new street to become a well-used street. Kingsway will be a fine street, but what was going to be built on it he did not know. It was twenty-five years since he suggested a street from south to north over Southwark Bridge, and what he proposed was to take a spur from the crown of Southwark Bridge in a north-west direction by forming a viaduct over Thames-street, debouching at the corner into Queen Victoria-street, almost opposite to Bread-street—that would be almost a dead level. Then he proposed to widen Bread-street, Wood-street, which would lead into Fore-street, the street opposite which was Red Cross-street, which was a wide street, as also was Golden-lane, and in this way give a direct line to Old-street. Opposite Golden-lane was a narrow street called Central-street, which he believed was to be widened, and that would lead to City-road. If such a route were made it would afford a saving of more than a quarter of a mile over the present route. There were some small streets on the north side of City-road which could be widened at small cost, and, if this were done, a direct way would be opened up to Islington, opposite the Agricultural Hall. He also advocated a direct west to east street by a new street commencing at West Smithfield, south of St. Bartholomew's Church (which would be opened out), passing through some very small property to Aldersgate-street and continued on the opposite side of this street to Fore-street, opposite St. Giles's Church, by widening part of Jewin-crescent through Fore-street, would lead on to Moorgate-street. The widening of London Wall should be continued, and also Wormwood-street. Crossing Bishopsgate-street a short street should be formed opposite leading to Houndsditch, which would be widened as far as Aldgate. The traffic could then pass through the Minories and over the Tower Bridge away to the south east. The street would therefore give direct communication with Holborn Viaduct, crossing four great arteries to the new roads south of Tower Bridge. The traffic at the Mansion House was very much congested at all times of the day, and if these proposed roads were formed the traffic in the City would be greatly relieved.

Mr. W. Nisbet Blair, Engineer to St. Pancras Borough Council, said he was disposed to agree that to cut out new lines of thoroughfare was such a costly business that it would not often be done, and that widening improvements would be undertaken instead. It was said that tramways would do away with the 'buses, but the same argument was used in regard to the Central London Railway. As a fact, not only was that railway used to its utmost capacity, but he understood that there were now more 'buses in Oxford-street than ever before. A great deal had been said which reflected on the capacity of the local authorities in London, and he was prepared to combat that opinion. There were a great many subsidiary authorities with powers to break up the streets, and in the Borough of St. Pancras there were twelve authorities independent of each other with statutory powers to open a road. They had to give notice to the local authorities, but the Borough Council could not

* See our issue for the 7th inst., p. 491.
† See our issue for April 30, p. 462.

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prohibit the opening of the streets; all they could do was to supervise the manner in which they should be opened. The subsidiary authorities carried on their work according to their own ideas. They were nominally controlled by the Borough Councils, but actually they were not. That was not the fault of the Borough Councils, but of the statutes under which the companies worked. It was true that roads might be opened for reconstruction at inconvenient times, but the time was not always within the absolute control of the Borough Councils. There were such things as hitches in the performance of a contract—material could not be delivered just as it was wanted, nor of the right quality. It had been within his experience that large consignments of wood blocks had to be condemned, and that involved delay. The time during which work might be executed varied with many things—the weather, for instance; and while it might be contended that works of repair should be executed more promptly, it must not be forgotten that Portland cement, which was a most valuable material for road foundations, required time for hardening, and if it were not allowed to dry and harden the great weight subsequently put upon it would cause it to crush up and the work would soon have to be done again. It was an economy of time to do the work thoroughly, but people seemed to think that the work was being neglected when the foundations were being left to dry and harden. He thoroughly agreed that obstructions ought to be removed from roadways. As to the obstruction caused on the footways and roadways by goods and salesmen, it was little good to take the offenders to the police courts if the magistrates did no more than fine them 5s. and 2s. costs. Such a fine was a very cheap rent. Other obstructions were the steam engines and heavy waggons, and these had lately been dealt with by the L.C.C., who had prepared two categories of streets along which at certain times of the day these vehicles were not to be allowed to pass. But the passage of these heavy vehicles caused such a vibration that they could not but have an injurious effect on house property. In his opinion such vehicles ought to be debarred rather than licensed. He hoped that the time would arrive when motor-cars would be able to use all parts of roads, and when such vehicles were in anything like a majority the streets would be paved with a material, such as asphalt, suitable for our streets. Wood pavement was suitable for horse traction, but of course it had objections from other points of view. Hard wood pavement was much more permanent, but it was more noisy; and he had not yet heard of any pavement which was ideal.

Mr. Blashill, in reply, said he was not so much inclined to divide slow traffic from quick traffic and put them in different streets; his opinion was that we should do away with slow traffic. People going through London ought not to go through at a foot pace when they could go at a quick pace, and we were coming to a time when it would be better, cheaper, and easier to take even the heaviest loads quickly rather than slowly. If true macadam roads were constructed, with small stones and without rubbish, a kind of mosaic was produced which made a splendid road. As to bridges over streets, he was alluding more to bridges for general traffic and not to foot-bridges so much. As to foot-bridges, if one watched such a place as the crossing at Queen-street and Cheapside, one would find that when the carriage traffic was ready to go east and west, the foot traffic was able to go, too. He still thought his idea of a tunnel from Southwark Bridge was worth consideration and something would have to be done sooner or later in connexion with the bridge. As to Portland cement, the weather certainly did affect it, but why should not some easily erected cover be put up over foundation work so as to keep off the rain? As to pavements, he believed we should have easily renewable pavements in time—those thin surfaces applied to the pavements about which he had always spoken. As to the idea about frequent trains of one or two carriages, he went to Exeter the other day in a very long train that did not stop between London and Exeter, and he could not see why it should not be possible to run that train in instalments, so to speak, and frequently, instead of in one long train and only once a day.

It was announced that the next meeting will be held in the Lecture Theatre of the Institute of Mining and Mechanical Engineers in Neville-street, Newcastle-on-Tyne, on the 26th inst., when the following papers will be read and discussed:—(1) "Newcastle in the Olden Time," illustrated by limelight views of the fortifications, public buildings, and other leading features of the town, by Mr. Richard Welford; (2) "The Rehousing of Displaced Populations," by Mr. Edgar J. Harper; (3) "Some thoughts on the Housing of the Working Classes," by Mr. Henry I. Potter, A.R.I.B.A. (of Sheffield); (4) "The Present position of the Law and Practice of Ancient Lights," by Mr. Philip E. Pilditch.

At the termination of the morning's proceedings, the members of the Northumberland and Durham and the Cumberland and Westmoreland Provincial Committees will entertain the visiting members at luncheon at the County Hotel, Neville-street. The members of the Institution will dine at the County Hotel on the evening of Thursday, May 26. The following day will be devoted to excursions.

MAGAZINES AND REVIEWS.

OWING to demands on our space, we must keep our notes on the contents of magazines more brief than usual.

The *Art Journal* contains an article by Mr. Arthur Sketchley on the Royal School of Art Needlework; and there is a short one on the Ruskin exhibition at Manchester, mentioning and describing some very interesting specimens of Ruskin's early drawing, as a child. Gainsborough's beautiful "Perdita" portrait is the subject of an article by Mr. Claude Phillips, and of the frontispiece to the number.

The *Magazine of Art* contains an appreciation of "some recent Glasgow painting"; one by Prince Karageorgevitch on Emile Gallé's glass work; one by Mr. A. B. Skinner on a stained glass window by Giugielmo de Marcilla, in the South Kensington Museum. Mr. Val Prinsep's recollections of "A student's life in Paris in 1859" are very interesting and amusing.

The *Architectural Record* (New York) devotes an article to "The Art of the High Building," many of the illustrations to which seem to show (as indeed the author appears inclined to admit) that any attempt at making artistic architecture out of these structures is being abandoned in despair. It is a pity, seeing the great opportunities which lofty buildings give for architectural effect; but they seem to be gradually coming to look like upright gridirons, all bars and interstices. "A Modern Classic" is the rather ostentatious title given to Messrs. McKim Mead and White's building for the Knickerbocker Trust, which is the subject of an illustrated article. If the term means only that it is in classic style, so it is; but if it is intended that the building is a "classic," in the sense of a model, in modern architecture, we must dissent, as we can see no architectural sense in putting up a Greek colonnaded temple with modern forms of partition and plate glass between the columns—it is both an æsthetic and historic incongruity.

The *Architektonische Rundschau* and the *Berliner Architektur-welt* do not present anything this month for special comment. In *Public Works* will be found descriptions of municipal St. Petersburg and municipal Stuttgart, and Mr. J. D. Watson commences a series of articles on "The Purification of Sewage." In the *World's Work* is an article by Mr. H. G. Archer on "Beautiful Railway Stations," written in a right spirit, in regard to the architectural possibilities of railway stations and the way they are neglected in London; but he does not seem to be aware that King's Cross, plain as it is, is really a very good design; and when he tells us that for the new front of Victoria Station engineer and architect are working together to produce a fine result, we can only say that we have never been able to learn the name of the architect, and we fear that it is a case like that of the Tower Bridge; the engineer to the work has engaged an architectural draughtsman. We should be glad to hear otherwise, but we know that efforts have been made to persuade the Company to employ an eminent architect for the station front, and without any avail so far. Mr. Archer mentions, what we were not aware of before, that it was first intended to carry out the whole of Euston Station in accordance with the massive and Greek character of the still existing portico, but that the Directors had to abandon the idea in deference to the economic outcries of the shareholders. How like England!

The *Burlington Magazine* contains an article on the late Mr. J. S. Forbes's Millet drawings, which has the merit of being accompanied by very numerous illustrations of the drawings. "Italian Boxwood figures of the early XVIth century," by Dr. Wilhelm Bode, is another subject of special interest, and also well illustrated.

In the *Antiquary* Mr. J. P. Arthur concludes his essay on "Neolithic and other remains near Harlyn," and Mr. William Andrews contributes a paper on the picturesque subject of "Funeral Garlands."

In *Technics* Mr. E. Fiander Etchells continues his series of articles on the "Theory of Structural Design," considering the bending moments and shearing forces in rolled steel joints supported at the ends or inserted in the side walls of a building. He properly points out that, while it is proved in text-books that if both ends are firmly fixed a beam will bear 50 per cent. greater load than a beam merely supported at the ends, the condition of fixity is so incompletely attained in floor joists that their increased load capacity is not usually more than 5 or 6 per cent. Mr. Henry Jarvis makes a further contribution on "Planning, Setting out, and Making Staircases," describing and illustrating the mode of procedure to be followed in setting out and making a straight flight of stairs. Two of the most instructive articles in this issue are the "Micro-Structure of Metals," by Mr. Percy Longmuir, and "The Estimation of Carbon in Iron Carbon Alloys," by Dr. H. C. H. Carpenter. In the former, Mr. Longmuir points out that the material benefits of microscopical examination are exceedingly promising, and that the results already obtained offer much information of direct practical value. This article includes a number of figures illustrating the structure of various metals, and showing that the properties of a metal depend not so much on the amount of each constituent present, as on the particular distribution of the constituents in compound form through the mass. Microscopic examination affords the means for studying this structural distribution, thereby affording trustworthy guidance towards fuller knowledge of metals and alloys. In the latter article, Dr. Carpenter briefly attempts to guage the limits of accuracy of the most trustworthy methods of estimating the various forms of carbon in the commercial alloys of iron and carbon; the varieties of carbon considered being "graphite," "temper," "carbide," and "hardening" carbon. Among other articles may be mentioned "Some Experiments on an Air-Cooled Petrol Motor," by Professor H. L. Callender; "The Continuous-Current Dynamo," by Mr. H. M. Hobart, dealing with the important question of insulation of the windings, and illustrated by numerous diagrams; "The Education of Electrical Engineers in London," by Professor J. A. Fleming, in which the writer briefly describes the work of the principal polytechnics and technical institutions in the metropolis, pointing out defects in our present system, and the need for further concentration of effort; and an illustrated article by Mr. F. H. Davis on "Surface Contact Systems of Electrical Traction."

In the *Nineteenth Century* Sir Michael Foster writes on the subject of "The State and Scientific Research," suggesting a method by which we might have the advantage of State-aided research without what have been believed to be its inevitable disadvantages. His plan is that the State, instead of providing its own laboratories and scientific staff occupied with the work of the State and with nothing else, should contribute to the maintenance of laboratories and scientific staffs, for pathological research, in connexion with Universities and other bodies in different parts of the country. Investigations carried out in this manner by the State would, he thinks, be quickened and kept straight by being always in touch with scientific work not directly belonging to the State. That is to say, the University laboratory would get the advantage of State aid, while the scientific inquirer would be free, and not hampered by officialism. The merits and advantages proposed to be obtained by endowment of research on this principle are discussed at considerable length.

In the *Cornhill Magazine* there is a very interesting article on "Modern Theories of Light," by Mr. W. A. Shenstone. He states that modern discoveries, such as the "Zeeman effect," "Becquerel rays," and "Electrons," are not so revolutionary as they may at first

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sight appear to the untrained scientist. J. J. Thomson's discoveries have upset neither the undulatory theory of light as established by Fresnel and Young, nor the electro-magnetic theory enunciated by Maxwell and partly proved by Hertz. Mr. Shenstone attempts to show that there has been nothing but orderly progress. With due respect to the author, however, we are inclined to an exactly opposite view. We consider that the theory of ions has completely upset all the orthodox scientific theories of last century, and in our opinion the undulatory theory of light has to be very considerably modified. We agree with the author, however, in thinking that until we know more about the constitution of the ether it is unwise to lay too great stress on any theory.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A YORKSHIRE district meeting of the members of the Association of Municipal and County Engineers was held at York on Saturday, May 14. The interest generally evinced in the work which Mr. Creer has carried out at York in the bacterial treatment of sewage brought together a large gathering of members. The President (Mr. W. Weaver, C.E., Kensington), presided, and among those present were Messrs. A. Creer, York; J. T. Eayrs, Birmingham; J. Cartwright, Bury; A. M. Fowler, Manchester; J. Lobley, Hanley; A. D. Greatorex, West Bromwich; F. S. Yates, Waterloo; C. Brownridge, Birkenhead; T. W. Spencer, Tynemouth; W. H. Hopkinson, Keighley; C. F. Wike, Sheffield; R. C. Mawson, Evesham, and others.

The Lord Mayor heartily welcomed the Association to York, and said the one thing they boasted of was their drainage scheme. That had cost them something like a quarter of a million of money. It was one of the difficulties that municipal authorities had to contend with, and one that was always opening out fresh fields of opportunity for engineering skill.

The President said they would be much interested in viewing the sewage works and in listening to Mr. Creer's paper. Knowing the great skill and care which he bestowed on the work committed to his charge, they were quite sure they would derive from their visit great satisfaction and much useful experience.

On the proposition of Mr. Creer, York, seconded by Mr. Cartwright, Bury, Mr. W. H. Hopkinson, Keighley, was re-elected honorary secretary for the Yorkshire district.

Sewage Disposal at York.

Mr. A Creer, City Engineer, read a paper on sewage disposal at York. He said sewage disposal is the most interesting, and certainly one of the most absorbing problems that municipal engineers have to consider. It is being studied with care and attention by a number of earnest workers, through whose labours our knowledge on this subject is fast increasing, It is this general interest that promises so well for the future, and led the writer to think that the time is very near when this difficult and complex problem, that has already cost this country many millions of money, may be solved on scientific principles, and when the designing and working of a sewage disposal works may present none of those uncertainties, both in results, and in the approval of the Local Government Board, that now trouble the souls of the great majority of municipalities and their officials.

Various standards of purification, or rather of impurity, have been sanctioned provisionally by river's boards and county councils, and tacitly acquiesced in by the Local Government Board. In this district it had been fixed at one grain of oxygen absorbed per gallon, and one-tenth of a grain of albuminoid ammonia per gallon. These varying standards have obviously been fixed by the various rivers' boards and county councils to suit the different conditions that obtain in their respective districts. In the writer's opinion no standard can be a fair and equitable one, if fixed arbitrarily and without any reference to local conditions, and to the proportion the volume of effluent bears to the volume of the stream or river into which the effluent discharges. It is obviously unfair to fix upon the same standard for an effluent discharging into a river with a minimum flow of fifty volumes of effluent, as for an effluent which forms in itself the bulk of the volume of the stream into which it is discharged. In the latter case a non-putrescible effluent should be insisted upon, but surely in the former some latitude should be allowed. If it is allowable to run crude sewage into a tidal river it should surely be allowable to discharge an effluent purified to a limited extent into a river of a greater volume than many a tidal river.

What the results of the labour of the Royal Commission on sewage disposal may be it is difficult to forecast. We must possess our souls in patience, and hope that it may be a rational solution of the problem, moderate and reasonable in its requirements, and with a certain amount of elasticity in its working that will commend it to the majority of municipalities.

Many towns have, during the past twenty years, spent vast sums of money on works for the chemical precipitation of sewage and its attendant evils of sludge pressing and disposal of cake; they are now in the position of having to begin practically over again, and incur additional debt before the loans for the first expenditure are liquidated. This is a matter of very serious moment, and one that should be very seriously considered by the Local Government Board when laying down hard and fast lines for municipalities to follow.

He had in mind a certain place in Yorkshire where the sewage purification problem has been shelved from time to time by the authority; they are now in much the same position as they were thirty years ago; they have incurred little or no expenditure on works, and are now in that happy position of knowing that their policy of letting things slide has resulted in the saving of large sums of money; while those municipalities who have honestly tried to deal with the problem, regardless of cost are in the unfortunate position of seeing their works practically condemned, and, looming in the future, further large expenditure on works that may turn out to be as futile and unsatisfactory as those they had but a few years before carried out under pressure.

It is this uncertainty that the Royal Commission should end. Works carried out with the approval of the Local Government Board, on the lines laid down by them, should, if carried out, suffice at least for a period sufficient to enable the authority to pay off the debt incurred in their construction.

The sewerage scheme at work was designed and carried out by Mr. James Mansergh. The works were commenced in 1890, and with the exception of the house connexions were completed in 1894. The actual cost of the scheme was 207,851*l*. The system for which the works were designed was milk of lime treatment, followed by a solution of aluminoferric. The sewage is naturally alkaline.

The total average quantity lifted per annum (over seven years) has been 1,730,000,000 gallons—viz., 1,239,000,000 gallons a maximum lift of 33 ft. increased by friction to about 47 ft., and 491,000,000 gallons a lift of about 16 ft.; in the latter case the pumps not infrequently discharge against a head of water in the river. The average daily flow at the pumping station over this period is 4,739,000 gallons; the average cost of lifting the 1,730,000,000 gallons has been 20s. 1·30d. per million gallons.

The annual cost of precipitation and pressing during the same peirod has averaged 2*l*. 4s. 11d. per million gallons treated at the works.

From February to December, 1896, the sewage was chemically treated with lime and aluminoferric, the quantity used varying with the quantity of sewage delivered at the works and to some extent with its strength; the average was about five grains per gallon of lime and of five grains per gallon of aluminoferric. During this period eleven analyses of the sewage effluent were made. The purification worked out at 67·8 per cent. for oxygen and 76 per cent. albuminoid ammonia. As the sewage was naturally alkaline, and complaints were made as to the action of lime on the fish in the river, its use as a precipitant was discontinued for a certain period, and the sewage treated by aluminoferric only, the average quantity used being six grains per gallon. From December, 1896, to December, 1897, twelve analyses were made of the sewage and effluent. The purification worked out at 70 per cent. oxygen absorbed and 78 per cent. albuminoid ammonia. A curious feature in the case was that during the whole of these periods samples of the river water were taken and analysed at the same time as the sewage, one from half a mile above the outlet from the disposal works and one from half a mile below. The results showed an average of 25·8 oxygen absorbed in the twenty-three samples above the outlet and an average of ·270 oxygen absorbed below the works. On ten occasions the river below the outlet was better than that above, and on the remaining thirteen occasions worse. In consequence of a number of dead fish being found in the river strong complaints were made by the fishery board, and the West Riding Rivers Board; and with the view of ascertaining if they could in any way improve the effluent the Corporation empowered the writer to experiment in bacteriological and other methods of sewage purification.

Five sets of experiments were made—covered septic tank and single contact, crude sewage and double contact beds, ladder filter—crude sewage and multiple contact—open septic tank and continuous filtration, and open septic tank effluent and double contact; all these had been discontinued with the exception of the open septic tank and continuous filtration, which had been continued with the construction of a grit chamber at the entrance to the open septic tank. This filter has, up to the end of March, been at work for three years and nine months; it was built on economical lines, the walls of common local bricks and the filtering medium of a very poor description. It has nevertheless done excellent work during this period in having passed 209,808,000 gallons of sewage, and, along with the septic tank, effected such a purification that on leaving the filter it contains only half the impurity allowed by the West Riding Rivers Board, and is absolutely non-putrescible. From May 7 to August 1, 1902, 2 ft. 6 in. of sediment had accumulated in the grit chamber. There was at the latter date an entire absence of scum both on the grit chamber and on the open septic tank. The average depth of sludge in the bottom of the open septic tank was 3 in. The grit was cleaned out for the first time on September 4. At this date a 2-in. scum covered the surface of both the grit chamber and the open septic tank. The depth of sludge was 4 ft. 10 in., and occupied about 2,000 cubic feet of the chamber. As 21½ million gallons of sewage had passage through this would be equal to one cubic yard to 290,000 gallons of sewage. Of course it would be understood that this sludge was not all mineral matter.

From observation since made the writer has come to the conclusion that, under the circumstances that obtain in this experiment, the chamber should be cleaned out once in every two or three weeks. The very satisfactory results obtained from the open septic tank and continuous filter induced the Sewerage Committee to construct a second continuous filter on somewhat similar lines, endeavouring in the new work to ascertain what kind of filtering media would give the best results. This filter is filled with four different classes of material—viz., clinker, hard broken bricks, honeycomb slag, and gas coke. These were filled in separately, and form four distinct vertical sections in the filter; the cubic contents of each section of the filter is as follows: 1,324 cubic yards clinker, 277 cubic yards hard broken bricks, 166 cubic yards honeycomb slag, and 166 cubic yards gas coke.

It is rather early yet to state definitely which material will ultimately prove most efficient. This filter was started on April 29, 1903, and up to February 23 had passed on the average 362 gallons per square yard per twenty-four hours, or 1,752,000 gallons per acre per day. With reference to the septic tanks he said two tanks, each 164 ft. long by 40 ft. wide, have been used as open septic tanks, the flow from the first passing through the second; the velocity of the flow for some days before and after the observations was ·28 ft. per minute, or 16¾ ft. per hour, and the quantity passing 628,000 gallons per twenty four hours. It is evident that this tank does something more than liquefy the organic solids, as the sewage on this occasion was purified during its progress through the tank to the extent of about 50 per cent, both in oxygen absorbed and albuminoid, and it is evident that this improvement is not confined to the later period of its flow through the tank, as the percentage of purification is greatest in the first 18 ft. of flow, gradually diminishing as it proceeds until it reaches a point when a further flow of 100 ft. fails to effect any further improvement in the sewage. The inference is that both anaerobic and aerobic bacteria are working throughout the whole effective length of the tank, and that when a certain stage of purification has been reached, a different process is required to carry on the work. The action on the suspended solids is very interesting. Of the total quantity entering the tank with the sewage, 75 per cent.

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was organic and 25 per cent. mineral. On leaving the tank the suspended solids have been reduced to 58 per cent.; and this was composed of 73 per cent. of organic suspended matter, and 27 per cent. mineral; this approximates very closely to the proportions in the raw sewage.

A large number of observations have been taken of the temperature of the sewage, filter bed, filtrate, and atmosphere during the past three years. Shortly, the results are as follows: In the winter the sewage averaged 8 deg. above the atmosphere, the filtrate 3 deg. below the sewage. The filter itself averaged from 2 deg. below the sewage to 1 deg. above, the lower temperature being in that part of the filter nearest to the outside wall. There can be little doubt that this form of filter wholly above ground lends itself admirably to thorough aeration. Observations have been taken at the openings in the pigeon-hole wall at the termination of the perforated pipes by means of an anemometer; the results show that notwithstanding the numerous openings for the admission of air into the filter, the velocity on the windward side varied from 350 ft. to 1,050 ft. per minute; while on the lee side it varied from 550 ft. to 1,240 ft. per minute from the filter, sufficient to satisfy the most voracious microbe.

Mr. J. T. Eayrs, Birmingham, said it was obviously a fallacy to insist upon a certain percentage of purification, as the effluent of the sewage of a large town with 90 per cent. of purification, might be worse than the crude sewage of a small town. When he visited the sewage works at York some time ago, he was surprised at the large takes of fish by fishermen quite close to the outfall of the sewage works. Another remarkable fact was that the quality of the water in the river was practically the same below the sewage outfall, and after it had passed through the City, as the water taken from the river on the other side of the City.

Mr. A. M. Fowler, Manchester, said that in towns of a similar character to York, where there were few manufactories, the bacterial system was a great success. But to apply this system to manufacturing towns it was necessary to have all the facts with respect to the trade effluents.

Mr. Spencer, Tynemouth, speaking from experience of sewage outfall works into tidal rivers and the sea, said it was a question whether it would not be to the benefit of the community to have some treatment of the sewage which was discharged into tidal rivers and into the sea, instead of discharging the crude sewage.

Mr. A. D. Greatorex, West Bromwich, contended that the volume of effluent to the volume of the stream into which it was discharged must have an important bearing upon the standard of purification.

Dr. Wilson, Chief Inspector to the West Riding Rivers Board, agreed with Mr. Creer that an arbitrary chemical standard of sewage purification was not to be advocated. It would be absurd to fix the same standard for an effluent discharged into a navigable river like the Ouse, and an effluent discharged into a small stream which might afterwards be used for drinking purposes. The action taken by the Rivers Board was with reference to a chemical effluent, which underwent reaction and deterioration after discharge into the river, whereas a bacterial effluent improved after its discharge.

Mr. C. F. Wike, Sheffield, and Mr. Hirst having taken part in the discussion, a hearty vote of thanks was accorded to Mr. Creer for his paper.

The Sewerage Committee entertained the President and members to luncheon in the Guildhall, and in the afternoon the members visited the sewage disposal works, proceeding there by steamer.

THE SLATE TRADE.—In the paragraph on the slate trade in our last issue the word Crown has been taken as brown. The co-operators are negotiating for quarries on Crown land.

CO-OPERATIVE BRANCH STORES, FERRYHILL, NORTHUMBERLAND.—New branch stores have been erected at Ferryhill village for the Coxhoe and Cornforth Co-operative Society. The architect was Mr. R. Sandeson, Coxhoe, and the builders Messrs. Makepeace and Valks, Trimdon, the heating apparatus being supplied by Messrs. Dinning and Cook, Newcastle. The cost of the work has been about 1,500*l.*

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Hampstead Borough Council 9,477*l.* for paving works; Guardians of Wandsworth Union, 21,100*l.* for poor law purposes; and Woolwich Borough Council 1,135*l.* for site for extension of depot. Sanction was also given to borrowing as follows:—Wandsworth Borough Council, for various purposes, and Woolwich Borough Council 1,100*l.* for assisted wiring of consumers' premises for electric lighting, etc.

Locomotives on Highways.—The adjourned report of the Public Control Committee was submitted, recommending a series of by-laws with regard to the use of locomotives in London. It was suggested that certain streets should be scheduled in which locomotives should be prohibited during certain hours.

Mr. Beachcroft complained that the use of these heavy traction engines in the streets made life a burden to many people, and the foundations of their houses insecure. He moved an amendment to the effect that the Local Government Board be asked to institute a public inquiry into the use of such locomotives, and that it be referred back to the committee for the purpose of approaching the Local Government Board.

Mr. Sidney Low, in seconding the amendment, said mechanical traction in the streets had come to stay, and it was for them to consider how it could best be adapted for the public advantage. He believed that mechanical science and ingenuity were not exhausted, and that it was possible to design a traction engine of great power, noiseless, emitting no smoke, and not unduly heavy. By passing those by-laws, however, they would stereotype the existing kind of locomotive.

After considerable discussion, Mr. Beachcroft modified his amendment so as to read that the report be referred back for further consideration, and in this form it was carried.

Shoreditch Technical Institute.—The Education Committee recommended, and it was agreed, that the estimate of 5,490*l.* submitted by the Finance Committee be approved; that expenditure not exceeding that amount be sanctioned in connexion with the erection of new buildings at the L.C.C. Shoreditch Technical Institute; that the work be carried out by the Council without the intervention of a contractor; and that the plans, specification, and architect's estimate of 5,040*l.* be referred to the Works Committee for that purpose.

Improvements.—The Improvement Committee recommended, and it was agreed, that the estimate of 25,000*l.*, submitted by the Finance Committee, be approved; and that expenditure on capital account not exceeding that amount be authorised in respect of works in connexion with the widening of Brook Green-road and Scrubs-lane, authorised by the London County Council (Tramways and Improvements) Act, 1903.

Haymarket Theatre.—Plans for the improvement of Haymarket Theatre, submitted by Mr. C. S. Peach, were agreed to on certain conditions.

Tramway Works, etc.—The Highways Committee recommended, and it was agreed:—

"That expenditure, on capital account, of sums not exceeding 22,190*l.* in all, be authorised, in respect of (i) the erection of the superstructure of the Camberwell car-sheds and workshops, required in connexion with the electrical working of portions of the London County Council Tramways, and (ii) the execution of the granite paving works, the laying of rails, and the construction of conduits in, and in connexion with, the car-sheds.

"That the erection of the car-sheds and workshops at Camberwell, referred to in the foregoing resolution, be carried out without the intervention of a contractor; and that the drawings, specification, and estimate of 19,000*l.* be accordingly referred to the Works Committee for that purpose.

"That the Highways Committee be authorised to arrange for the execution of the granite paving works, the laying of the rails, and the construction of the conduits necessary in, and in connexion with, the Camberwell car-sheds, to be carried out by the Council's tramways permanent-way staff.

"That the supplemental estimate of 4,500*l.*, submitted by the Finance Committee, be approved; and that expenditure, on capital account, of sums not exceeding that amount in all be sanctioned, in connexion with the roadwork and plate-laying portion of the reconstruction of the Tooting to Westminster, etc., sections of the London County Council Tramways.

"That the supplemental estimate of 900*l.*, submitted by the Finance Committee, be approved; and that expenditure of sums not exceeding that amount in all be sanctioned, in connexion with the provision of a temporary station at Deptford, for the electrical working of portions of the London County Council Tramways.

"That the estimate of 1,500*l.*, submitted by the Finance Committee, be approved; and that expenditure, on capital account, of sums not exceeding that amount in all, be sanctioned in connexion with the preparation of plans, and the making of surveys, etc., for the erection of the car-sheds and sub-stations required for the electrical working of the first sections (about 22½ miles of single line) of the Council's (Northern) Tramways."

Housing.—The Housing of the Working Classes Committee recommended, and it was agreed:—

"That application be made to the Secretary of State for the Home Department for an order permitting a modification of the London (Aylesbury-place, Clerkenwell, and Union-buildings, Holborn) Improvement Scheme, 1899, so as to provide for (*a*) the inclusion in the scheme of so much of the site of Mallory-buildings as is surplus land acquired in connexion with the St. John-street improvement; (*b*) the reduction of the accommodation to be provided on the Aylesbury-place area for 200 persons to that for 164 persons; and (*c*) the increase of the accommodation to be provided on the Union-buildings area for 1,200 persons to that for 1,236 persons, or such other numbers as the buildings will accommodate.

"That Messrs. W. Smith and Son be allowed to sublet to Messrs. John Williams and Co. the slating work under their contract for the erection of Barnaby-buildings, Leroy-street, Bermondsey; that the solicitor do prepare the agreement prescribed by the Council's standing order relative to sub-letting.

"That the Haslemere Builders, Limited, be allowed to sublet, to Messrs. Roberts, Adlard, and Co., the slating work under their contract for the erection of Wenlake-buildings, Roby-street, St. Luke; that the solicitor do prepare the agreement prescribed by the Council's standing order relative to sub-letting."

The Mansion at Avery Hill.—The Parks Committee recommended:—"That the resolution of the Council of May 5, 1903, directing that, until otherwise ordered, a part of the mansion and gardens at Avery Hill be used as a convalescent home be rescinded, and that it be referred to the committee to consider and report what should be done with the mansion at Avery Hill."

Mr. Piggott said this property cost 280,000*l.*, and the house itself, which was a modern building of the best work, cost 153,000*l.* He suggested that it might be utilised for clerical work, or for a teachers' centre, or something of that kind.

Captain Swinton agreed to add to the recommendation the words, "and confer with the Establishment Committee," and, as amended, it was carried.

The Council shortly after adjourned until June 14.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Paddington, South.—An oriel window in front of No. 12, Stanhope-place, Hyde-park, Paddington (Mr. J. Darch for Mr. M. Epstein).—Consent.

Bermondsey.—A one-story shop in front of No. 254, Southwark-park-road, Bermondsey (Mr. J. Dumphreys for Messrs. Pearks, Gunston, and Tee, Ltd.).—Consent.

Dulwich.—Buildings with bay windows and one-story shops, on a site abutting upon the west side of Peckham-rye and south side of East Dulwich-road (Mr. A. Keen for Mr. H. Line).—Consent.

Whitechapel.—The retention of a projecting sign at No. 86*a*, Brick-lane, Whitechapel (Mr. B. Schewzik).—Refused.

Width of Way.

Bethnal-green, North-east.—A building upon a site abutting upon the north side of Bullard's-place, and west side of Warley-street, Bethnal-green, with external walls at less than the prescribed distance from the centre of the roadway of Bullard's-place (Mr. W. B. Medlicott for Rev. G. K. S. Marshall).—Consent.

Hackney, North.—A one-story shop on the forecourt of No. 37, Church-street, Stoke Newington (Mr. W. Whincop for Mr. E. Fenn).—Consent.

Bow and Bromley.—A two-story building on the forecourt of No. 416, Old Ford-road, Bow (Mr. J. E. Brook for Mr. O. Shannon).—Refused.

Width of Way and Lines of Frontage.

Brixton.—A building with a one-story addition in front on the site of Nos. 242 to 258 (even numbers only), inclusive, Ferndale-road, Brixton, to abut also upon Stockwell-avenue (Mr. J. W. Chapman for the Bon Marché, Ltd.).—Refused.

Strand.—The re-erection of Nos. 17, 18, 19, 20 and 21, Tavistock-street, Covent-garden (Mr. E. L. Lutyens for Sir G. Newnes, Bart.).—Refused.

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Line of Frontage and Space at Rear.

Westminster.—An addition in front of No. 276, Vauxhall-bridge-road, Westminster (Messrs. Essex and Co., Ltd.).—Refused.

Space at Rear.

Lewisham.—A modification of the provisions of section 41 of the Act, so far as relates to the proposed erection of a building upon a site abutting on the south side of London-road and west side of Dartmouth-road, Lewisham, with an irregular open space at the rear (Messrs. Tolley and Son for the London and South-Western Bank, Ltd.).—Consent.

Formation of Streets.

Battersea.—That an order be issued to Mr. W. M. Wilkins sanctioning the formation or laying out of a new street, for foot traffic only, to lead from Town-hall-road northward to Theatre-street, Battersea (for the Metropolitan Borough of Battersea).—Consent.

Greenwich.—That an order be issued to Mr. W. J. Kemp sanctioning the formation or laying out of new streets for carriage traffic upon the Page estate, Vanburgh-fields, Greenwich, to lead out of the south side of Westcombe-park-road and eastern side of Park-wall (for Mr. C. H. Polhill).—Consent.

Wandsworth.†—A deviation from the plans sanctioned for the formation or laying out of new streets for carriage traffic upon the Totterdown-fields estate, Upper Tooting-road, Wandsworth, so far as relates to an alteration in the formation of the new streets southward of Franciscan-road and the omission of the southernmost new street running parallel with Church-lane (Mr. R. Robertson for the Housing Committee of the Council).—Consent.

Wandsworth.—That an order be issued to Mr. R. C. Overton refusing to sanction the formation or laying out of new streets for carriage traffic, and of a street for foot traffic only, on a site on the south side of Lower Richmond-road, eastward of River-street, Wandsworth (for Mr. R. Emerson).—Refused.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—An excursion meeting in connexion with the Northern Architectural Association was held on Saturday last week, when the party first visited Mr. Milburn's block of new buildings in Dean-street, over which they were conducted by Mr. Wood, of the firm of Messrs. Oliver, Leeson, and Wood. An interesting tour was made through the buildings, which, it was stated, will cost over 100,000*l.*, and it is arranged that the members will pay a second visit when the structure is nearer completion. Afterwards the party paid a visit to the Laing Art Gallery in New Bridge-street, which, it is expected, will be completed in less than two months' time. This was the second visit of the members of the Association to the Gallery, and through the kindness of Messrs. Cackett and Dick, together with the clerk of the works, Mr. Thomas Marriner, they were enabled to see it in its present advanced stage of completion to advantage. During the afternoon Mr. F. W. Rich was re-elected a member, and the following gentlemen were nominated:—Members: Mr. Charles Frederick Newcombe, Newcastle; Mr. Charles E. Oliver, Newcastle; Mr. Harold Oswald, Newcastle; Mr. C. J. Pringle, Newcastle; Mr. E. A. Whipham, Stockton; and Mr. G. T. Wilson, Blackhill. Associates: Mr. R. P. Blakey, Sunderland; Mr. H. S. Dixon, North Shields; Mr. Stanley M. Fill, Rowland's Gill; Mr. G. N. Limpricht, Newcastle; Mr. C. W. Milburn, Newcastle; Mr. W. Shanks, Newcastle; and Mr. G. S. Twizell, Newcastle. Students: Mr. G. E. Gibson, Newcastle; and Mr. J. B. Richardson, Shotley Bridge.

LEICESTER SOCIETY OF ARCHITECTS.—We have received the thirty-first Annual Report of the Leicester and Leicestershire Society of Architects, a pamphlet got up in an excellent manner, forming an admirable specimen of paper and typography. The number of members is now 111, an increase of five since the last report. There is nothing in the report itself that we need specially comment on, but we may notice that it is accompanied by two or three sheets of careful and highly finished measured drawings and details of old houses in Leicester, and of the screen in St. Mary's, Leicester; an interesting and valuable addition to a report of this kind.

NEW SCHOOL, STRATFORD.—The opening of the new Council school in Holborn-road, Stratford, took place recently. The building affords accommodation for 1,600 children. Mr. Jacques is the architect.

THE SANITARY INSTITUTE.

AT an examination in practical sanitary science held in London on May 6 and 7, fifteen candidates presented themselves. The following six candidates were awarded certificates:—G. J. Abell, Exmouth; A. A. Fillary, Manor Park; J. Lawrence, Paddington; R. M. Macfarlane, Chelsea; W. H. Moffatt, Wood Green, N.; W. A. Passmore, Bedford-row, W.C.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—On Thursday, the 12th inst., a visit was paid by this Institution to the Great Northern, Piccadilly, and Brompton Railway Works, the party numbering about one hundred. They were received on behalf of the engineers, Sir James Szlumper and Mr. W. Szlumper, by Mr. A. F. Baynham, resident engineer of the South Kensington to Holborn section. Mr. Price was also present on behalf of the contractors for the works. The railway is an amalgamation of two railways, viz.: the Brompton and Piccadilly Circus Railway and the Great Northern and Strand Railway. The Brompton and Piccadilly Circus Railway will extend from a physical junction with the Metropolitan District Railway west of Earl's Court Station to Holborn at the upper end of the new County Council street. It there forms a junction with the Great Northern and Strand Railway to King's Cross and Finsbury Park. The Brompton and Piccadilly Circus Railway Act was passed in the year 1897, and that of the Great Northern and Strand in 1899; they were amalgamated by Act of Parliament in 1902. The works were commenced in the early part of 1902 and are in operation throughout the whole of the line, more than half the tunnelling having been completed. The ordinary "Greathead" shield was used to commence with, but after the works had been in progress for a short time an improvement on it was made by fixing an electrically-driven excavating wheel at the face of the shield, which obviated the necessity of the clay being excavated by hand to permit the shield to push forward. This appliance has proved to be a great success, and is now in use over the whole of the line. With the original "Greathead" shield, the maximum number of tunnel rings completed in any week was about 40, whereas with the new rotary excavating machine as many as 72 rings have been inserted per week. This machine will be seen at work at Brompton-road Station, where two shafts, each 23 ft. in diameter, have been sunk to a depth of about 60 ft. from the surface, for the provision of four lifts. Temporary connexions have been made between the foot of these lifts and the railway tunnels. Both the up and down station tunnels have been completed, each 21 ft. 2½ in. internal diameter. The running tunnels in a westward direction have been completed and one of the tunnels eastward is completed for a considerable distance.

LONDON TRAFFIC COMMISSION.

AT the sitting of this Commission on Thursday last week, evidence was given by Mr. Charles Carpenter, the Chief Engineer to the South Metropolitan Gas Company. Witness described the district over which his company supplied gas, and said that it was comparatively rare to have a complaint of obstruction or inconvenience caused by the laying of gas mains, although their area contained 1,100 miles of gas mains. During last year, 687 openings of ground were necessitated owing to escapes of gas in the connexions to private consumers, and 100 openings on the services supplying the public lamps. The introduction of the penny-in-the-slot system had changed the principles governing gas supply in London during the last few years. The increased demand had resulted in the practice of laying a service main in each footway, reserving the roadway for the trunk main.

Mr. C. A. Brereton, M.Inst.C.E., partner with Sir John Wolfe Barry, submitted another scheme for through roads in London. He suggested the construction of a road west to east, commencing at the junction of Kensington Gardens-terrace and Bayswater-road, and taking the line of a number of existing streets, passing eventually in front of Liverpool-street station, and terminating in a circus, to be formed at the junction of Whitechapel High-street and Commercial-road. The road was to be a double-storied one, with a surface roadway between the building lines of 140 ft. Under the roadway would be two subways, one containing an electric railway for fast traffic, and the other electric tramcars; along the side of the tramways a continuous footway would be constructed, which would not only serve the trams, but, by being connected by stairs with the surface, would provide underground crossings for pedestrians. The north and south road would be from the Elephant and Castle to the junction of Seven Sisters-road with the Holloway-road. The cost of construction, exclusive of land, would be about 1,250,000*l.* per mile.

Mr. A. R. Stenning, surveyor, put in estimates of the cost of land. On the east and west route the cost would be 9,250,000*l.*, on which there would be a possible recoupment of 2,000,000*l.* The figures for the north to south route would be 7,000,000*l.*, with a recoupment of about 1,000,000*l.*

Sir J. Whittaker Ellis was then called. He said that he was of opinion that surface travelling was more advantageous than travelling by means of tubes, etc. He objected strongly to the construction of tramways, however, not only on the ground that they monopolised the public thoroughfares, but because they would soon be superseded by motor-cars. Witness submitted plans of a number of new main streets and thoroughfares, and, in connexion with the various schemes, advocated the widening of Waterloo Bridge, the architectural outline of which could be maintained if it were deemed as an æsthetic question desirable to do so. He was in favour of a tribunal being appointed to deal exclusively with all schemes involving interference with the public highways.

On Friday, Mr. Harper, the Statistical Officer to the London County Council, submitted a lengthy statement with regard to the tramways of London. The total length of line open for traffic, which was 62·16 miles in 1879, rose to 126·87 miles in 1889. It then remained stationary until 1901, and had, in the last two years, been somewhat increased by the extension of the London United Tramways System. Taking the whole of London there was almost one mile of tramway to every square mile of area.

Colonel E. B. Crompton, Chairman of the Kensington and Knightsbridge Electric Lighting Company, then gave evidence on behalf of his company. He agreed, in the main, with the evidence given by Dr. Kennedy the previous week.

The Commission adjourned until June 2.

METROPOLITAN WATER BOARD.

A MEETING of the Metropolitan Water Board was held on the 13th inst. at the offices of the Metropolitan Asylums Board, Victoria Embankment, Mr. R. M. Beachcroft, the Chairman, presiding.

Appointment of Chief Engineer.—The Works Committee reported that they had had under consideration the steps to be taken in connexion with the organisation of the engineering department of the Board, and had decided to ask the Board to adopt the principle that a chief engineer should be appointed for the whole of the works to be transferred to its control. If their proposal were adopted, they suggested that the salary attaching to the office should be 2,500*l.* per annum. The committee recommended "(*a*) that the Board do appoint a chief engineer; (*b*) that the appointment be made at a salary of 2,500*l.* per annum, and subject to the condition that the gentleman appointed do give his whole time to the service of the Board and be not allowed to take any private practice or other paid employment; and (*c*) that an advertisement be issued inviting applications for the appointment, and that the applications received in response to the advertisement be referred to the Works Committee with instructions to submit to the Board the names of three candidates whom they consider most suitable for the appointment." After some discussion the Board agreed to the recommendations, with the addition of the words "who should give his whole services to the Board" to the first recommendation.

Rotherhithe Tunnel.—The Works Committee also stated in their report that a letter had been received from the clerk of the London County Council informing the Board that it would be possible for the Board to lay water mains in the subway of Rotherhithe tunnel after its completion, should the Board desire to do so.

Rate of Wages and Hours of Labour.—The General Purposes Committee reported that they had considered with the Law and Parliamentary Committee the desirability of framing general clauses respecting wages, hours, and conditions of labour, and sub-contracting, suitable for insertion in contracts for the supply of goods or services to which the Board might be a party, as instructed by the Board. With regard to the desirability of framing

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general clauses for insertion in the Board's contracts, they thought that, having regard to the custom so largely prevailing amongst public authorities in and about the metropolis, the Board would also desire to make some provision on the subject of workmen's wages and conditions of labour. They recommended that the following clauses should be inserted in contracts for the supply of goods or services to which the Board might be a party:—"(*a*) The contractor shall not, without the written permission of the Board, assign or sublet this contract, or any part thereof, but this prohibition shall not refer to such subletting as may be customary in the trades concerned; (*b*) the contractor shall pay to all workmen employed by him in or about the execution of this contract, or any part thereof, such rates of wages and observe such hours of labour as in the district in which the work is to be executed are generally obtained and recognised by associations of employers and trade unions, and will, throughout the execution of the contract, prominently exhibit a copy of this clause in the workshops and where work for the Board is carried on." The recommendation was adopted.

Central Offices for the Board.—The General Purposes Committee in their report also stated that they had had before them the question of the chief offices of the Board, in view of the imminence of the "appointed day." The rooms which they now occupied at Caxton Hall were no longer adequate for their purposes. Suggestions had been made that suitable chief office accommodation could be found at one or other of the existing offices of the water companies. Special attention had been given to that point, and it was found that none of the premises would afford the accommodation required. There was sufficient ground at the New River Company's premises in Rosebery-avenue to build a chief office, but, even if the Board at once decided to erect offices there, they could not be ready for occupation for some considerable time. The committee, therefore, submitted the following recommendation:—"That the estimate of 3,600*l*., submitted by the Finance Committee, be approved as an estimate of costs, debt, or liability under section 20 (3) of the Metropolis Water Act, 1902, and that the Board do take on lease for a period of twenty-one years, terminable by the Board at the end of the fifth, seventh, or fourteenth year, the whole of the upper portion of the western block of the Savoy Hotel extension (save and except the ground floor shops in the Strand and the northern shop in Savoy-court) at a rent of 3,500*l*. per annum, exclusive of rates and taxes." This was agreed to.

Other business was transacted, and the Board adjourned.

Illustrations.

COMPETITION DESIGN FOR LIVERPOOL CATHEDRAL.

THE plan, elevation, and section of this design were published in our issue of July 4, 1903, to which we may refer the reader who wishes to know the basis on which the design of the crossing is worked out. In reviewing the designs in the second competition, in our issue of May 30 of last year, we remarked that "the manner in which the central space is designed and roofed, and the lantern carried over it, shows a great deal of thought, and is illustrated by a large and ably worked-out constructional drawing." The present illustration shows the exterior architectural effect of this design of the crossing, and the way it groups with the whole.

The design was submitted in the competition under the name of Mr. (now Sir) C. A. Nicholson only; the present perspective, however, came to us under the name of the firm, Messrs. Nicholson and Corlette.

KINGSGATE HOUSE, HIGH HOLBORN.

THIS building stands partly on the site of houses in Kingsgate-street—a street which was extinguished in the recent widening of Southampton-row, and this, together with the fact that it is at the top of the new Kingsway, accounts for the figures of the two kings, the first Edward and the last, at the base of the gable. They are the work of Mr. Richard Garbe. The ground floor and basement of the building form the premises of a new branch of the National Provincial Bank of England, and the upper floors contain suites of offices.

Cornish granite is used in the lower part of the front, and Portland stone and Wrotham bricks above. The floors are of concrete, strengthened by light steel bars on a special system carried out by Messrs. Moreland and Son. Messrs. Dove Brothers were the builders and Mr. Arthur Keen the architect.

TECHNICAL SCHOOL AND FREE LIBRARY, RAMSGATE.

THIS design, but without the plans, was exhibited in last year's Royal Academy.

The architect, Mr. Stanley D. Adshead, considers that the plans sufficiently explain themselves without further comment.

CHESTALL HOUSE, STAFFORDSHIRE, AND "ONE ASH," LOUGHBORO'.

THESE two illustrations of houses built by him were sent to us by the late Mr. Larner Sugden shortly before his death.

Under the circumstances, we have not been able to procure any plans, but we give the perspective views as examples of the work of an architect who carried out a good many houses, all marked by quiet and picturesque character.

NEW CHURCH, SUMMERSTOWN, TOOTING.—The consecration of the new Church of St. Mary, at Summerstown, took place recently. The new building will accommodate 800 people, and the cost of the work has been 10,846*l*. Mr. G. Pinkerton was the architect.

The Student's Column.

ARCHES.—XX.

TABLE VIII. contains details relative to numerous masonry arches, which are representative both of ancient and of modern practice. This table is worthy of careful study, and, making due allowance for the marked differences exhibited by the proportions of the same structures, it should be useful in setting out the dimensions of proposed arches, and for the purpose of comparing calculated proportions with those that have been adopted in general practice.

Further, the careful study of this table will prove both interesting and instructive. Even allowing for the different materials used in the construction of the various bridges, some very striking comparisons will result from such an examination of the table, although no exact conclusions can be drawn from the data given without taking into account all details of construction, the loads to be carried, and all attendant conditions. But general conclusions may be drawn that should prove of practical service to the designer. In Fig. 83 we have plotted the thickness at the crown of each arch mentioned in Table VIII. in terms of the ratio of span to rise. Each example is numbered to correspond with Table VIII., and—simply as a matter of convenience—the results are divided by curves into five groups, each of which should be considered by the light of the information contained in the table.

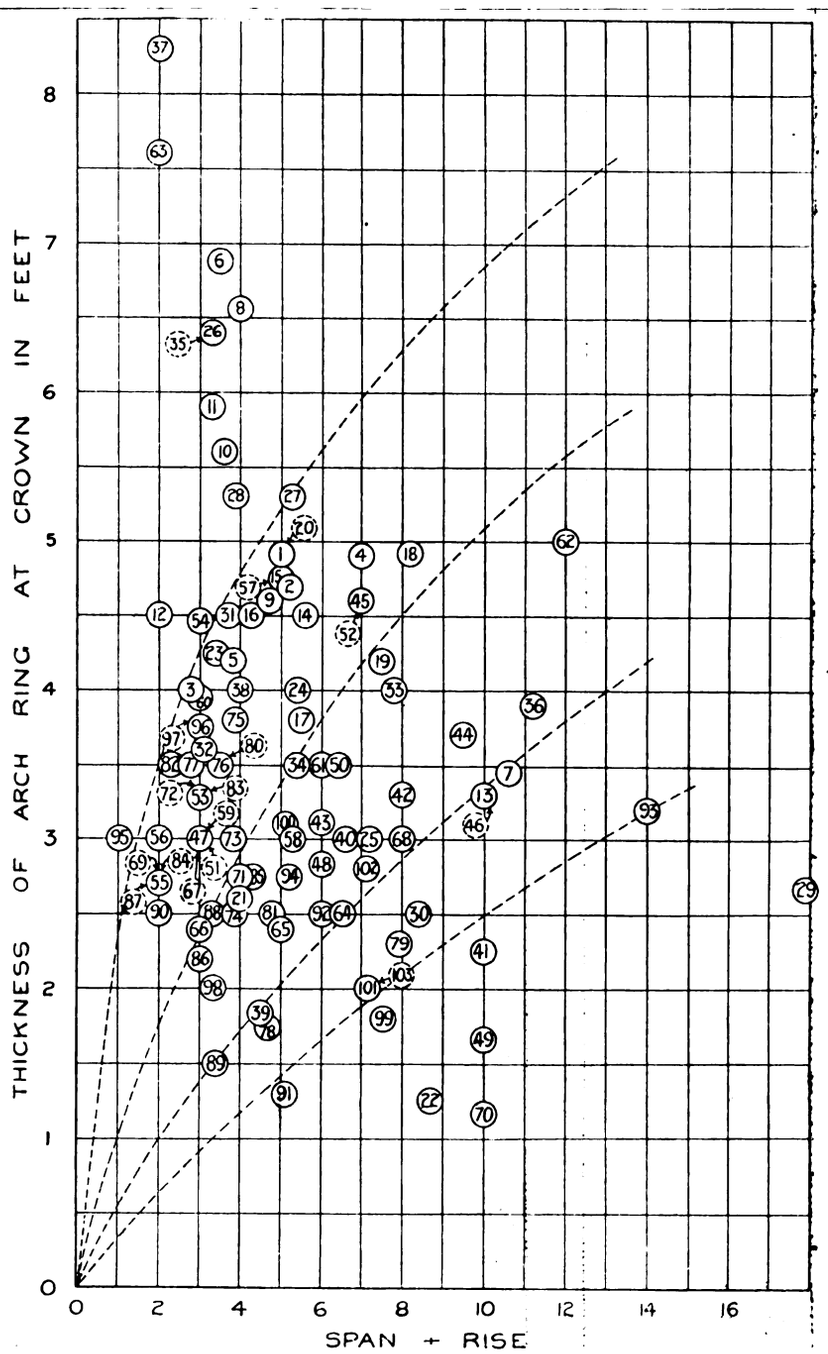

Fig. 83.

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TABLE VIII.—DETAILS OF MASONRY ARCHES BUILT AT VARIOUS DATES.

Many of the arches included in this table form parts of bridges or viaducts comprising several spans. As a general rule, the longest span has been selected for the purpose of the table.

No.	Name.	Date.	Materials and Remarks.	Span.	Rise.	Radius at Crown.	Curve of Intrados.	Thickness of Arch Ring.		Spandrel Construction.	Engineer.
								At Crown.	At Springing.		
				Feet.	Feet.	Feet.		Feet.	Feet.		
1.	Plauen Viaduct, Saxony	1904	Hard slate (local)	295·2	59·1	344·5	5-centred	4·92	8·2	Lateral arched openings	Liebold
2.	Luxemburg, Luxemburg	1902	Stone (local)	277·6	53·1	173·8	Elliptical	4·7	7	Lateral arched openings	Séjourné
3.	Trezzo, Italy	1380	Granite (Destroyed A.D. 1416)	251	88	133	Circular	4	—	—	(Visconti's engineers)
4.	Morbegno, Italy	1903	Granite (three hinges)	230	33	—	3-centred	4·92	6·58	Semi-circular arches	(Rete Adriatica Ry. Co.)
5.	Cabin John, U.S.A.	1859	Granite	220	57	134	Circular	4·2	6·2	Arched voids	Meigs
6.	Jaremeze, Hungary	1893	—	213	59·6	—	Circular	6·89	10·2	Lateral arched openings	Huss
7.	Max Joseph, Munich, Bavaria	1902	Sandstone	210	19·7	—	Circular	3·45	—	Lateral arched openings	—
8.	Gutach River, Baden	1901	Sandstone	210	52·5	—	Circular	6·56	9·17	Lateral arched openings	(Railway engineer)
9.	Grosvenor, Chester	1832	(Lead in joints)	200	42	143	Circular	4·6	7	—	Hartley
10.	Gour Noir, France	1888	—	196·8	52·8	—	Circular	5·6	13·8	Lateral arched openings	Draux
11.	Schwaendeholztobel, Baden	1901	Sandstone	187	55·7	—	Circular	5·9	8·53	Lateral arched openings	(Railway engineer)
12.	Ballochmyle, Ayr, N.B.	—	—	181	90·5	90	Circular	4·5	6	—	Miller
13.	Munderkingen, Würtemburg	1893	(Three metal hinges)	164	16·4	—	Circular	3·3	3·6	Longitudinal arched voids	Bois
14.	Wheeling, W. Va., U.S.A.	1893	—	159	28	—	Circular	4·5	6	Longitudinal arched voids	Hoge and White
15.	London	1831	Granite	152	29·5	162	Elliptical	4·75	10	Longitudinal arched voids	Rennie
16.	Gloucester, Gloucestershire	—	—	150	35	98	Elliptical	4·5	—	—	Telford
17.	Elyria, Ohio, U.S.A.	1886	Sandstone	150	27	—	Circular	3·8	4·5	Gravel and stone	Kinney
18.	Turin, Italy	—	—	148	18	160	Circular	4·92	—	—	Mosca
19.	Putney, London	1886	—	144	19·3	—	—	4·2	4·2	Longitudinal voids	Bazalgette
20.	Alma, Paris	—	Rubble in cement	141	28·2	103	Elliptical	4·92	—	—	Darcel
21.	Pont-y-Prydd, Wales	1750	Rubble in lime	140	35	88	Circular	2·6	2·6	Lateral voids	Edwards
22.	Toulouse Canal, France	1902	Concrete steel	139	16	260	3-centred	1·25	3·5	Two ribs 2.5 ft. apart joined at top by concrete-steel slab, monolithic with ribs	Quintin
23.	Solis, Switzerland	1902	—	137·7	68·8	68·8	Circular	4·25	8·53	Lateral arched openings	—
24.	King Edward VII., Kew, London	1903	Granite	133	24·5	—	Elliptical	4	8	Longitudinal arched openings	(Albula Railway)
25.	Coulouvrenière, Geneva	1896	Concrete	131·2	18·2	—	Circular	3	3	Longitudinal arched openings	Barry and Brereton
26.	Mantes, France	1765	—	128·2	38·5	—	Elliptical	6·4	—	—	Bois
27.	Maidenhead, Berkshire	1837	Brick in cement	128	24·2	169	Elliptical	5·3	7	Longitudinal voids	Hupeau
28.	Neuilly, France	1774	—	127·9	32	160	Elliptical	5·3	—	—	Brunel
29.	Bourbonnais, France	—	Granite	124	6·92	281	Circular	2·67	3·60	—	Perronet
30.	Zanesville, Ohio, U.S.A.	1902	Concrete-steel	122	14·5	—	Elliptical	2·5	—	Solid, concrete & gravel filled	Vaudray
31.	Waterloo, London	1816	Granite	120	32	112·5	Elliptical	4·5	8	Longitudinal voids	Landor
32.	Tongland, Kircudbright, N.B.	1801	—	118	38	65	Circular	3·6	3·6	Longitudinal arches	Rennie
33.	Napoleon, Paris	—	Rubble in cement	116	14·8	120	Circular	4	—	—	Telford
34.	Cresheim, Phila., U.S.A.	1893	Yellow sandstone	116	21·2	—	Circular	3·5	4	—	Couche
35.	Nantes, France	—	—	115·1	34·4	89·5	Elliptical	6·4	—	—	Webster
36.	Murr, Würtemburg	1887	(Three lead hinges)	114·8	10·2	—	Circular	3·9	5·3	—	—
37.	Alcantara, Spain	105	(One span still standing)	110	55	—	Circular	8·3	—	Longitudinal arched voids	—
38.	Etherow River, Cheshire	—	—	100	25	—	Circular	4	4	—	Trajan
39.	Bishop Auckland, Durham	1388	—	100	22	—	Circular	1·83	1·83	—	Haskoll
40.	Wellington, Leeds	1819	Local stone	100	15	—	Circular	3	7	—	—
41.	Schlitza River, Austria	—	Concrete (1 : 3 : 5)	100	10	—	3-centred	2·25	2·25	Longitudinal voids	Rennie
42.	Grand, Saône, Charrey	1888	—	98·4	12·3	—	Circular	3·3	4·9	Earth filled	(Government engineer)
43.	Trinita, Florence	1566	—	95·8	16	—	Elliptical	3·1	—	—	—
44.	Louis XIV., France	—	—	94	9·8	—	Circular	3·7	—	—	Ammanati
45.	Stoneleigh, Warwickshire	—	—	92	13	—	Circular	4·6	—	—	Perronet
46.	Enz, Würtemburg	—	—	91·8	9·2	—	Circular	3·3	4·9	—	Rennie
47.	Dean, Edinburgh	1885	(Three lead hinges)	90	30	49	Circular	3	—	Lateral voids	Liebbrand
48.	Licking Aqueduct, Ohio, U.S.A.	—	—	90	15	75	Circular	2·83	—	—	Telford
49.	Dayton, Ohio, U.S.A.	1903	Concrete-steel	88	8·8	—	3-centred	1·66	3·83	Gravel filled	Fisk
50.	Darlaston, Staffordshire	—	—	86·5	13·5	76	Circular	3·5	—	—	Turner
51.	Elkader, Iowa, U.S.A.	1888	Limestone	84	27·9	—	—	3	4	—	—
52.	Oise, France	—	—	83	11·8	—	Circular	4·6	—	—	Tschirgi
53.	Stultz, Switzerland	1903	—	82	41	41	Circular	3·28	4·92	—	—
54.	Trilport, France	—	—	80·4	27·7	—	Elliptical	4·46	—	—	(Albula Railway)
55.	Royal Border, Berwick	—	Brick in cement	80	40	40	Circular	2·7	—	—	—
56.	Conemaugh, Pa., U.S.A.	—	Sandstone in lime (without sand)	80	40	40	Circular	3	3·5	—	—
57.	Posen, Germany	—	Brick in Cement	80	16	58	Circular	4·7	—	—	—
58.	National Park, Washington, U.S.A.	1902	Concrete-steel, boulder faced	80	15	72·6	Circular	3	4	—	—
59.	Schuylkill Falls, Pa., U.S.A.	1890	Masonry and earth	80	26	—	—	3	3	—	Douglas
60.	Orleans, France	—	—	79	26·3	—	Elliptical	3·95	—	—	Nichols
61.	Hutcheson, Glasgow	—	—	79	13	—	Circular	3·5	4·5	—	—
62.	St. Maxence, France	1785	—	77	6·4	119	Circular	5	12	Continuation of voussoirs	Stephenson
63.	Westminster	1750	(Rebuilt 1864)	76	38	38	Circular	7·6	14	Longitudinal arched voids	Perronet
64.	Allenton, Northumberland	—	—	75	11·5	—	Circular	2·5	3	—	Labelye
65.	New Brunswick, N.J., U.S.A.	1893	Brick, masonry, and earth	75	15	—	Circular	2·4	2·4	—	Stephenson
66.	Earn, Perth, N.B.	—	—	75	24	—	Elliptical	2·4	3·2	—	Dean and Westbrook
67.	Big Rock Creek, Ill., U.S.A.	1904	Concrete-steel	75	25·57	59	3-centred	3	—	Concrete filled	Rennie
68.	Staines, Middlesex	—	—	74	9·2	—	Circular	3	6	—	Cartlidge
69.	Edinburgh, N.B.	—	—	72	36	36	Circular	2·75	—	—	Rennie
70.	Waterloo, Iowa, U.S.A.	1903	Concrete-steel	72	7·2	120·5	3-centred	1·16	2·6	Sand filled	Mylne
71.	Black Rock, Pa., U.S.A.	—	—	72	16·5	47	Circular	2·75	2·75	—	(Marsh Bridge Co., engineer)
72.	Rariton River, U.S.A.	1902	—	72	24	39	Circular	3·33	3·33	—	Robinson
73.	Brent, Middlesex	1837	Brick in cement	70	17·6	44	Elliptical	3	—	—	—
74.	Wellesley, Limerick	—	—	70	17·5	—	Elliptical	2·5	—	Longitudinal voids	Brunel
75.	Lea, London	—	Brick	70	17·5	—	Elliptical	3·8	3·8	Longitudinal voids	Nimmo
76.	Rockville, U.S.A.	—	—	70	20	40·3	Circular	3·5	3·5	—	Braithwaite
77.	Swatara, Pa., U.S.A.	—	Brick, stone faced	70	25	—	Circular	3·5	3·5	—	—
78.	Herkimer Via. (N.Y.), U.S.A.	1903	Concrete-steel	66·5	14	46·5	Circular	1·75	4·5	—	Osborn
79.	Staines, Middlesex	—	—	66	8·3	—	Circular	2·3	5·8	Spandrels gravel filled. Expansion joints over each pier	Watson
80.	Ouse, York	—	Brick, stone faced	66	19·3	—	Elliptical	3·5	7	Longitudinal voids	Rennie
81.	Bow, London	1837	Granite	66	13·7	47	Elliptical	2·5	4	Longitudinal voids	Greene
82.	New Brunswick (N.J.), U.S.A.	1903	Limestone	66	28	—	Circular	3·5	—	Solid masonry	Walker and Burgess
83.	Landwasser, Switzerland	1902	Limestone	65·6	32·8	32·8	Circular	3·28	4·42	Earth filled	Brown
84.	Hoghton, Lancashire	—	—	65	32·5	—	Circular	2·75	2·75	—	—
85.	Rivanna Aqueduct	—	—	65	15	—	Circular	2·75	4	—	(Albula Railway)
86.	Bewdley, Worcester	—	—	60	20	33	Circular	2·2	—	Solid masonry	Haskoll
87.	Conemaugh (new), Pa., U.S.A.	1890	—	60	30	—	Circular	2·7	2·7	—	Eilet
88.	Chestnut-st., Phila., U.S.A.	—	Brick in cement	60	18	34	Circular	2·5	—	Masonry and loose stone	Telford
89.	Llanrwst, Denbigh	1636	(Pointed at crown)	58	17	33	Circular	1·5	—	—	Brown
90.	Carrollton, Maryland, U.S.A.	—	Granite	58	29	29	Circular	2·5	2·5	—	—
91.	Glatt, Switzerland	—	(Three lead hinges)	55·8	11	—	Circular	1·3	2·5	—	Kneass
92.	Monocacy, Maryland, U.S.A.	—	—	54	9	45	Elliptical	2·5	—	Longitudinal arched voids	Inigo Jones
93.	Nemours, France	—	—	53·7	3·8	—	Circular	3·2	—	—	—
94.	Forth, Stirling, N.B.	—	—	53	10·2	—	Circular	2·75	—	—	Fisk
95.	Abattoir-st., Paris	—	—	53	5·1	—	Circular	3	—	—	Perronet

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TABLE VIII.—DETAILS OF MASONRY ARCHES BUILT AT VARIOUS DATES (*continued*).

No.	Name.	Date.	Materials and Remarks.	Span.	Rise.	Radius at Crown.	Curve of Intrados.	Thickness of Arch Ring. At Crown.	Thickness of Arch Ring. At Springing.	Spandrel Construction.	Engineer.
				Feet.	Feet.	Feet.		Feet.	Feet.		
96.	Dôle, France	—	—	52	17·5	—	Elliptical ...	3·75	—	—	—
97.	Château-Thierry, France	—	—	51	17	—	Elliptical ...	3·75	—	—	Perronet
98.	Avon Viaduct, Somerset	—	Brick in cement	50	15	28·3	Elliptical ...	2	—	—	Vignoles
99.	Newton Stewart, Wigtonshire	—	Brick	50	6·6	—	Circular	1·8	2·5	—	Rennie
100.	Race-st., Phila., U.S.A.	1893	—	50	9·8	—	Circular	3·1	3·1	Masonry and loose stone	Wilson
101.	James River Aqueduct, U.S.A.	—	—	50	7	—	Circular	2	—	—	Ellet
102.	Byrd Creek Aqueduct, U.S.A.	—	—	50	7	—	Circular	2·8	4·2	Solid masonry.....	Ellet
103.	Filbert-st., Phila., U.S.A.	—	Brick in lime	50	7	—	Circular	2	—	—	—

METROPOLITAN ASYLUMS BOARD.

THE final meeting of this Board before the election was held on Saturday last week at the offices on the Victoria Embankment.

Among the correspondence received from the Local Government Board was a letter sanctioning an expenditure of 320*l.* on the installation of telephones and fire alarms at Leavesden Asylum, and a letter sanctioning a proposal to enter into a contract with Messrs. Clements, Jeakes, and Co., for the remodelling of fifteen stoves in the wards of the South-Western Hospital, without first advertising for tenders.

Eastern Hospital.—On the recommendation of the Finance Commitee, it was agreed to apply to the Local Government Board for an order, authorising the expenditure of a sum, not exceeding 457*l.*, on the remodelling of the laundry, and rearrangement of the machinery at the Eastern Hospital.

Works at the Head Office.—Messrs. Hovenden and Barber were appointed to take out the quantities of the cleaning and repairing works to be carried out at the head office of the Board.

Leavesden Asylum.—The action of the Works Committee in instructing Messrs. W. H. Barber and Son to measure up the variations on Mr. Martin's contract for the erection of the female attendants' home at this asylum was approved.

South-Eastern Hospital.—The Works Committee reported that they had allowed Messrs. W. H. Barber and Son to charge an extra one per cent. commission upon the total value of the accepted tender for the works of reconstruction at this hospital, on account of extra work having been necessary.

Quantity Surveyors.—On the recommendation of the Works Committee it was agreed that so much of the resolution of the Board of March 16, 1895, as directs that the same quantity surveyor who may be appointed to take out the quantities of building and other works shall be also appointed to measure up "extras" and "omissions" on the completion of the works, be, and is hereby rescinded.

The Committee were of opinion that it was not always desirable or necessary that the managers should be bound to call in the same surveyor, who had taken out the quantities, to measure up works on completion. It was thought that the Board should have a free hand in the matter.

COMPETITIONS.

LIBRARIES, ECCLESTON AND SUTTON.—The following is the result of the competition for two branch libraries at Eccleston and Sutton:—Messrs. Briggs and Wolstenholme, Richmond-terrace, Blackburn, first for Eccleston and Sutton; Mr. Lloyd E. Ward, 1, Waterloo-street, Birmingham, second for Eccleston Library; Mr. Albert Warburton, 2, Bold-street-chambers, Warrington, second for Sutton.

NORTHERN COUNTIES DEAF AND DUMB INSTITUTION, NEWCASTLE-ON-TYNE. — In a limited competition for the extensions and alterations to the Northern Counties Deaf and Dumb Institution the committee selected the design of Mr. Stephen Piper, architect, 4, Ridley-place, Newcastle. The proposed outlay is about 8,000*l.*

CRICKET AND GOLF PAVILION, BULWELL FOREST, NOTTINGHAM.—A new cricket and golf pavilion has been erected on Bulwell Forest Ground, Nottingham. The building consists of a dressing-room for cricketers at one end, and another for golf players, with a room in the centre for general use. In the front is a verandah. The erection has cost about 500*l.*, and the work has been carried out by Mr. George Barron, under the direction of Mr. F. B. Lewis, the City Architect.

BOOKS RECEIVED.

SPON'S ARCHITECTS' AND BUILDERS' PRICE BOOK; 1904. By W. Young. Edited by Clyde Young. (E. and F. N. Spon.)

GREAT MASTERS; REPRODUCTIONS IN PHOTOGRAVURE. Part XV. (W. Heinemann. 5s.)

A PRACTICAL GUIDE FOR SANITARY INSPECTORS. By F. C. Stockman. (Butterworth and Co., and Shaw and Sons. 5s.)

JOURNAL OF THE SANITARY INSTITUTE: April quarter. (E. Stanford. 2s. 6d.)

SOFT WOODS AND COLONIAL TIMBERS. By Percy A. Wells. (Percival Marshall and Co. 6d.)

BRITISH ENGINEERING STANDARDS CODED LISTS, VOL I. (Robert Atkinson, Ltd.)

Correspondence.

SHAKESPEARE'S FRIENDS.

SIR,—The pleasant little churchyard of St. Mary the Virgin, Aldermanbury, has for some time past been in use as a public resting-place, and special attention has lately been directed to this beautiful church on account of its being threatened with demolition, but the venerable vicar, the churchwardens, and parishioners have been successful in warding off that danger at the Easter vestry meeting. I wish, with your kind permission, just to inform your numerous readers that in the centre of the churchyard there is standing a bust of Shakespeare and pedestal:—"In memory of John Heminge and Henry Candell, fellow actors and personal friends of Shakespeare, who lived many years in the parish of St. Mary the Virgin, and are buried there. The memorial was given to the nation by Charles Clement Walker, Esquire, of Lilleshall Old Hall, Shropshire. A.D. 1896."

Then at the north end of Carter-lane, St. Paul's, is fixed a tablet inscribed thus:—"Upon this site formerly stood 'The Bell,' Carter-lane, from whence Richard Quincy wrote the letter to William Shakespeare, dated the 25th Octr., 1598. This is the only letter extant addressed to Shakespeare, and the original is preserved in the museum at his birthplace, Stratford-upon-Avon. This tablet was placed upon the present building by leave of the Postmaster-General 1899."

SCRUTINEER.

OBITUARY.

MR. BIRCH.—Mr. George Henry Birch, whose death we announced in our last issue, had been in but indifferent health during some months past, and in last January went to Italy and Sicily to seek recovery. He died on the 10th inst., two days after his return. Mr. Birch was the son of Mr. Charles Birch, and was born at Canonbury on January 2, 1842, and had his earlier education at Darnell's private academy in Theberton-street, Islington. When sixteen years of age he was articled to Mr. Charles Gray, architect; he subsequently entered the offices of Sir Matthew Digby Wyatt and of the late Ewan Christian. Mr. Birch was elected an Associate of the Royal Institute of British Architects in 1876; in 1871-2-3 he served as Vice-President and in 1874-5 as President, of the Architectural Association. He was the honorary secretary of the London and Middlesex Archæological Society during the interval 1877-83; Cantor Lecturer to the Society of Arts in 1883; a Vice-President of the St. Paul's Ecclesiological Society; and a Fellow of the Society of Antiquaries. In November, 1894, he succeeded the late Wyatt Papworth as Curator of the Soane Museum, being the fifth architect who has held that appointment since Sir John Soane's death in 1837. For that post he was eminently qualified by his attainments in the field of historical archæology and art; as we observed some few years ago in a description we published of the chief contents of the museum, he was emphatically the right man in the right place. In 1884, and upon a very short notice, Mr. Birch prepared the models for, and carried out the erection of, the "Old London Street" for the Health Exhibition at South Kensington of that year, illustrations of which, after two drawings by Mr. A. B. Pite, were published in the *Builder* of May 17, 1884. Mr. Birch's original water-colour drawing, which constituted an interesting record of the work, was shown in the Royal Academy exhibition of 1886. The Old London Street, with its church tower, gate, wall, etc., constructed at a cost of nearly 14,000*l.*, and based throughout upon authentical data, formed a highly-popular exhibit. Some portions of the models were subsequently used for fitting up the Boltons studios in Redcliffe-road, S.W. Mr. Birch was the author of a folio volume, "Old House, Lime-street, City," for which some of the drawings were made by Mr. R. Phené Spiers; and a large and important work upon London churches of the XVIIth and XVIIIth centuries, which we reviewed, giving some illustrations, on June 6, 1896. At the end of last year was published his illustrated volume, "London on Thames in Bygone Days." He was, in fact, a leading authority upon all matters relating to the history, both domestic and architectural, of London and, we may add, of Paris. Some while ago he devoted much of his leisure time to the rearrangement and grouping of the late Mr. J. E. Gardner's unrivalled collection illustrative of the topographical history of London; his own collection of prints and drawings, and sketches, which we have had the advantage of inspecting, is of interest and value. On behalf of the Corporation of the City, Mr. Birch undertook the preparation of a set of designs for a scheme of triumphal arches and general decoration at London Bridge and its approaches for the Coronation procession which had been fixed to take place on June 27, 1902. When in active practice Mr. Birch carried out a great deal of architectural work in Hampshire, Suffolk, Worcestershire, Middlesex, and other counties; he made the plans and designs of Acton Reynald Hall, Shrewsbury, for Sir Walter Corbet, Bart; he prepared all the drawings for the scheme of painting and redecoration for St. Nicholas Cole Abbey Church in the City (1884), and was architect of the Rectory House in Lambeth-hill. He also carried out the alterations and improvements, with an extensive redecoration, of the parish church (1828) of Staines, Middlesex, in 1885. Amongst his minor works we may mention the Working Men's Club buildings at Scholes, in Yorkshire. His dexterity and ingenuity were often in request for the making of models, toy-houses, etc., for his younger friends, of whom he was a great favourite; and at the museum he spared no pains in assisting and guiding the visitors in their inquiries or research. Mr. Birch possessed a wide and uncommon knowledge of ancient and modern history, and was well versed in architectural literature.

BUSINESS PREMISES, EDINBURGH.—New business premises for Messrs. Lorimer and Son have been erected in Union-street, Edinburgh. The building has been built from the plans of Mr. R. G. Wilson, architect.

CHAPEL EXTENSION, HUCKNALL, NOTTINGHAM.—The memorial stones of the extension of the Wesleyan Methodist chapel at Hucknall were laid recently. The additional building will be built on to the rear end of the old chapel, the whole structure providing accommodation for 470 persons, or an increase of 120. The contractors for the work are Messrs. Vallance and Blythe, Mansfield, and the architect Mr. J. E. Goodacre, Mansfield. The cost is estimated at 650*l.*

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GENERAL BUILDING NEWS.

OLIVER PLUNKETT MEMORIAL CHURCH, OLDCASTLE, IRELAND.—On the 1st inst the dedication took place of the Oliver Plunkett Memorial Church, Oldcastle. The church, which is built in the Gothic style, comprises nave, transepts, sanctuary, side chapels, and two sacristies. It is 131 ft. in length, and the nave measures 34 ft. in width, and the entire breadth across is 90 ft. The sanctuary measures 31 ft. by 24 ft. 6 in., and the height to the apex of the ceiling is 43 ft. The tower, which is not as yet complete, is only 53 ft., over which it is intended to build a bell stage and spire, which will, it is expected, bring the total height of the church to the top of the cross to 146 ft. Over the entrance door there is a five-light window, and the sanctuary is lighted by three-light lancet windows, with moulded arches, springing from polished shafts. At the end of the church and behind the High Altar are three stained-glass windows, representing, in the centre, Immaculate Conception, St. Brigid, the name which the old church went by, on one side, and St. Patrick on the other, all by Meyer, of Munich. The building has been carried out by Mr. Patrick Nolan, Monaghan, the plans having been prepared by Mr. W. H. Bryne, Dublin, who supervised the work.

ST. JOSEPH'S CHURCH, LIMERICK.—St. Joseph's new church, Limerick, was formally opened on the 24th ult. Limerick limestone has been used throughout. The bell tower, when finished, will attain an elevation of 160 ft., the church being 40 ft. at the eaves, with a rise of over 20 ft. to the apex. A large-sized statue of St. Joseph, executed by Mr. Smith, sculptor, Dublin, is placed midway up the campanile, and two flights of cut stone steps lead to the main entrance. The church will accommodate 2,000 persons, its greatest length being 66 ft. by 40 ft. the transept being 100 ft. The floor is of wood, bordering a passage of mosaic tiles running through the centre. The organ gallery, supported by two granite pillars, faces the high altar. Inside the sanctuary an oak wood-block floor is laid down, and the Communion rail is capped with polished oak supported by metal columns. The walls are painted in light-coloured duresco. The high altar is in part Sicilian marble, supported by two clusters of circular columns of empress red marble, with carved caps and moulded bases. The tabernacle is of Carrara marble, sustained by pillars of marble. Statues of SS. Peter and Paul are to right and left of the altar, while further out are the figures of two angels bearing candelabra. The front panel of the altar support is of Sicilian marble, representing the Last Supper. The side altars are dedicated to the patron saint of the church and Our Lady of Victories, the material used being the same as that in the high altar. The chancel arch is sustained by two marble pillars of rouge royal, richly carved at base and top. A massive silver sanctuary lamp, supplied by Messrs. Egan, jewellers, Cork, has been presented. The church will be lighted throughout with electricity, the installation having been placed by the Ampere Company, the heating apparatus being supplied by Messrs. Musgrave and Co., Belfast. The erection of the church was entrusted to Messrs. Ryan, builders, Limerick, the architect being the late City Surveyor, Mr. W. E. Corbett, C.E., and clerk of the works, Mr. T. Stafford. High and side altars are the work of Messrs. E. Sharpe, sculptors, Dublin, and the painting, etc., was carried out by Mr. J. M'Namara, Limerick.

RESTORATION OF THURLESTONE CHURCH, DEVON.—The interesting old church at Thurlestone was reopened, after restoration, by the Bishop of Exeter on the 28th ult. Portions of the present church were built in the XIIIth century, probably upon the site of a still older church, for it has a fine Norman font of red sandstone. In the beginning of the XVth century, probably in the year 1407, a lady chapel was thrown out, and subsequently an aisle, and in the XVIth century a porch was added, and later still, a vestry. The parish of Thurlestone derives its name from a rock in the bay, called the Thurlestone rock, which forms a natural arch. The first syllable is derived from the Anglo-Saxon "thyrlian," to pierce. Thurlestone means Holestone. The title of the dedication of the church is lost, but there is reason to believe that it is All Saints, as upon that festival the churchwardens place a pair of gloves, and a copy of an ancient deed upon the high altar for the rector as a quit rent for the piece of glebe upon which the church house is built. The Bishop, therefore, rededicated it to God in honour of All Saints. The church, during the early part of last century, went through some damaging restoration and repairs, which have had, in a great measure, to be undone in the present restoration. The architect, Mr. Geo. H. Fellowes Prynne, when consulted in 1900, found the church to be in a deplorable condition, necessitating the rebuilding of certain portions, and new roofs in nave, and aisle. Every bit of the old stone or woodwork that it was possible to retain has been replaced, and the main characteristics of Devonshire churches have been carefully adhered to. The work has been executed by Mr. G. B. Andrews, builder, of Ivybridge, at a cost of about 2,400*l*.

UNION CHURCH, WOODFORD.—The opening services in connexion with the New Union Church, Woodford, Essex, took place on the 28th ult. The building is about 200 ft. long—a length divided in about equal proportions between the church itself, and the hall, Sunday school, and classrooms at the rear. The internal dimension of the church is 80 ft. The plan may be described as being a Greek cross, with shallow transepts, and the unusual width of which, some 35 ft., was of assistance to the architect in minimising the number of obstructing piers or columns. The nave, which is also 35 ft. in width, is roofed by a barrel ceiling. The piers, which are cased in rouge royal marble, carry wide semi-circular arches formed of bricks specially made of unusual length and thickness. The aisles are ceiled also with a semi-circular or barrel ceiling with a flat-tiled roof above. This, on the exterior, is broken into at intervals by the flying buttresses necessitated by the thrust of the nave arches. The church has seating accommodation for between 700 and 800 people. The building at the rear of the church contains a lecture hall nearly 60 ft. in length by 40 ft. in width, with an open roof, and lighted by a clerestory. The minister's and deacons' rooms, and a large church parlour are arranged above the classrooms, and a few steps above the level of the platform of the church. Above these again are the caretaker's quarters. The architect was Mr. C. Harrison Townsend, and the contractors were Messrs. A. J. Vigor and Co., while Mr. T. Gilloch acted as clerk of works.

CHURCH, SEATON DELAVAL.—The foundation stone has just been laid of the new church of St. Stephen's, at Seaton Delaval. The architect is Mr. C. S. Errington, of Newcastle, and the builder, Mr. Joseph Stobbs, of Cramlington. There is to be an apse chancel, and a baptistry at the west end. It will accommodate 300 worshippers, but can be enlarged if necessary at any future time. It will be joined to the old building by a covered way; and the former will still be used for meetings, social gatherings, etc., for members of the church.

CHURCH, SHIREBROOK, NOTTINGHAMSHIRE.—As we mentioned last week the Bishop of Southwell recently dedicated the nave of this church. The new building consists of a nave, and the old church being thrown into the new, as a south aisle, the whole gives seating accommodation for 800 persons, as against 200 formerly. The chancel of the new building is a temporary one, and the scheme will be carried out in its entirety when funds permit. The architect was Mr. H. J. Price, Nottingham, and the contractors were Messrs. Fisher Brothers, Mansfield. The length of the nave is 85 ft. 6 in., and the width of the nave and the north aisle is 35 ft. 6 in. The style adopted is a simple treatment of the Early Decorated period. The walling is coarsed rock, with faced work for the outside of local stone, and dressed walling for the inner surface. The dressings to the windows, arcade arches, buttresses, weatherings, etc., are in Weldon stone, and the material for the subject panels under the clerestory windows is Bath stone. The floor of the nave is in pitch-pine wood blocks, and the aisles are in terrazo mosaic. The windows are of stained cathedral glass. Messrs. Sharpe and Yeo are responsible for the carving. The building is illuminated by 100 16 c.-p. electric lights, the current being laid on from the Shirebrook Colliery. The church, when complete, will have a chancel 24 ft. wide and 28 ft. 6 in. in length, with an ambulatory all round, the northern portion forming the choir vestry, with the organ gallery over. The walling has been built by Messrs. Wilkinson and Son, of Bulwell; heating and electric installation, Messrs. Thomas Danks and Co., Nottingham; Messrs. F. Smith and Co., of London, are responsible for the temporary chancel; slating, Mr. A. Wright, Nottingham; oak seating, Addison and Co., Wellington, Salop. The general foreman of the works was Mr. W. Avery.

PROPOSED NEW CHURCH, WORCESTER.—Plans have been prepared by Mr. G. Fellowes Prynne, architect, of London, for a new church which it is proposed to erect on a site in London-road, Worcester. The cost of the edifice, exclusive of the tower, will be about 11,000*l*.

RESTORATION OF PARISH CHURCH, DEREHAM, NORFOLK.—The Dereham Parish Church was recently reopened after being restored. The work was carried out under the superintendence of Mr. Arthur Reeve, architect, by Mr. W. D. Hubbard, of East Dereham. The cost of the restoration has been about 1,631*l*.

CHURCH, HULL.—The Archbishop of York consecrated, on the 12th inst., the new Church of the Transfiguration, which is to serve the district of North Newington, Hull. The church, which is situated in Albert-avenue, Anlaby-road, is designed in the Early English style, and has been built of red brick, with roof of red Staffordshire tiles. Internally, the chancel arch goes close up to the roof, the arcades to the nave are of red brick with stone shafts, and the nave and chancel are domed with barrel roofs with moulded ribs. There is a pulpit of white stone with traceried panels, and the fittings of the chancel are all in oak and simple design. Messrs. Brodrick, Lowther, and Walker are the architects, and the building will accommodate 650 persons when completed. Two bays have yet to be added to the nave, and a tower is to be erected at the west end.

CHANCEL, CHRIST CHURCH, MOLDGREEN, YORKSHIRE.—On the 14th inst. the chancel added to Christ Church, Moldgreen, Huddersfield, was consecrated. The chancel, which was designed by Mr. G. F. Bodley, R.A., is 40 ft. long and 20 ft. wide. It contains a three-light high window, filled with a stained-glass representation of the Ascension. There is a window and a chamber, to which the organ has been removed, on the north side, and three two-light windows on the south side.

LOUDWATER CHURCH, BUCKS.—The new chancel of this church was opened on the 16th inst. The main portion of the original church was built in 1788 as a chapel of ease by Mr. William Davies, who spent the whole of his life of ninety-two years in Loudwater; the north wing, vestibule, and vestry being erected in 1835. The building, externally, had more the appearance of a stable than a church, while the interior effect was that of an inferior lecture hall or police-court, a box pulpit being placed against the east wall over the altar. In 1899, it was decided to rebuild the church, and plans were prepared by Mr. Geo. H. Fellowes Prynne; but owing to lack of funds, it was found impossible to commence any building operations until last year, when the contract for the new chancel was placed in the hands of Mr. H. Flint, builder, of High Wycombe. The material used for the chancel is red brick, with stone dressings and bands, and tiled roof. The cost of the work, together with necessary repairs to the old nave, has been about 2,000*l*.

NEW R.C. CHURCH, SWINDON.—The new Roman Catholic church, which has been erected in Groundwell-road, Swindon, was opened recently. The new edifice is cruciform in shape. The exterior walls are covered with an outer lining of flint, while for door entrances, etc., dressings of Corsham stone are used. Accommodation is provided for 500 persons. The structure has been erected from the plans of Mr. Doran Webb, architect, Salisbury, by Mr. Sidney Bell, builder, Andover. The estimated cost is 5,500*l*.

CONGREGATIONAL CHURCH, ILKESTON. — The foundation stones of the new Congregational church to be erected on the Wharncliffe-road, Ilkeston, were laid on the 27th ult. The church will consist of a nave 65 ft. long by 27 ft. wide, supplemented by side aisles, the east and west transepts measuring 20 ft. 6 in. wide and 12 ft. deep; the chancel will be 24 ft. wide by 19½ ft. deep. The full seating accommodation will be 530. The tower, which is to rise to over 60 ft. above the ground level, will carry a spire covered with copper, the total height to the top of the weather-vane being over 100 ft. The architect is Mr. H. Sudbury, and the contractor Mr. Earnshaw.

METHODIST NEW CONNEXION CHURCH, WALLSEND.—The new Methodist New Connexion Allen Memorial Church, which has been erected in Park-road, was opened on the 27th ult. The general contractor was Mr. W. T. Weir, Howdon-on-Tyne, the hot water heating apparatus has been supplied by Messrs. Emley and Son, Ltd., Newcastle, and the work has been carried out under the superintendence of Mr. Benjamin F. Simpson, architect, Newcastle.

NEW FREE CHURCH, MALVERN LINK.—The new Free Church which has been erected at Malvern Link was opened recently. The new structure has been designed by Mr. H. E. Lavender, architect, of Walsall, and the work has been carried out by Mr. Alfred Holloway, builder, of Malvern Wells. Mr. Thomas Jones has been responsible for the masonry portion. The gas fitting has been done by Mr. J. Edwards and Mr. J. Hall, and the grounds have been laid out by Messrs. J. Lewis and Son, Newtown Nurseries. The cost, including site, has been 3,500*l*.

NEW WESLEYAN CHURCH, WOKING.—The memorial stones of a new Wesleyan church,

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which is to be erected on a site in Commercial-road, Woking, were laid recently. The work is being carried out, from the plans of Messrs. W. J. Morely and Son, architects, Bradford, by Messrs. W. J. Drowley and Co., builders, Woking, at a contract price of 5,320*l*.

NEW MISSION CHURCH, USHWORTH COLLIERY, NORTHUMBERLAND.—The foundation stone of a new Mission Church at Ushworth Colliery was laid recently. Mr. Charleswood, of Newcastle, is the architect for the new building.

MISSION CHURCH, MERRYMEET, LISKEARD.—The foundation stone of a new mission church at Merrymeet, near Liskeard, was recently laid. The new building has a seating capacity of eighty persons, and the cost will be about 650*l*. Mr. J. Samson is the architect.

NEW WESLEYAN CHAPEL, BURNLEY.—The foundation stones of a new Wesleyan chapel, which is to be erected on a site in Manchester-road, Burnley, were laid recently. The new building is intended to seat over 700 people, and the cost is estimated at between 7,000*l*. and 8,000*l*. There will be a chancel, organ-chamber, vestries, etc., and a spire, rising to a height of 120 ft. The plans for the work have been prepared by Mr. W. A. Waddington, architect, of Manchester.

CONGREGATIONAL CHURCH, WEDNESBURY.—Foundation stones of a new Congregational church in Walsall-road, Wednesbury, were laid recently. The new building is to accommodate 600 persons, and the cost, inclusive of site, will be 4,280*l*. The work is being carried out by Messrs. Hammond Brothers, Darlaston, from the plans of Mr. C. W. D. Joynson, architect, Wednesbury.

CONGREGATIONAL CHURCH, BELFAST.—The opening of the John White Memorial church, which has been erected in Tennent-street, Belfast, took place recently. The walls of the building are of red brick, with dressings of Giffnock stone. The principal elevation is towards Tennant-street, and contains the two main entrance doorways, one opening into a vestibule in the centre of the front, and the other into a square tower at the south corner of the front. The doors at these entrances have been hung with patent double-action swing hinges. The tower, 12 ft. square inside, will be used as a vestibule on the ground floor, and will contain the stairs to a future gallery. Opposite the tower entrance is a 3-ft. doorway leading to a corridor, off which are the minister's vestry and lavatory, a second door opening from the vestry to the church for the convenience of the officiating minister. Beyond the vestry is the heating chamber, which is on a lower level, and is reached from the side passage at the south of the buildings. The woodwork used in the joinery is pitch-pine, the roof trusses being of the same material. The church is ventilated by means of Boyle's inlet wall tubes, the foul air being drawn away at the ceiling level through metal tubes by one of Boyle's exhaust ventilators. The church is heated by high-pressure hot-water pipes, installed by Messrs. Musgrave. The windows are glazed with leaded glass by Messrs. Campbell Brothers. The plumbing work has been carried out by Mr. Stone, Belfast; whilst Mr. George Jones, Belfast, executed the wrought-iron work; and the painting and decorating has been done by Mr. M'Kelvey, Belfast. The contractors in charge of the entire work were Messrs. C. and W. M'Quoid, and the architect was Mr. John Seeds, both of Belfast.

MISSION ROOM, ST. BRIDGET'S PARISH, WAVERTREE, LIVERPOOL.—The foundation stone of the new mission room, in Grosvenor-road, for the parish of St. Bridget's Wavertree, was laid recently by Mr. J. H. Stock, M.P. The new building will comprise a hall to accommodate 400, and will include a small hall. The building will be heated by low-pressure hot water, and the ventilation will be carried out by means of Tobin's inlets in the walls and extractor on the roof. The building is being carried out from the plans of Mr. Frank Rimmington, of Liverpool, the contractors for the work being Messrs. Bullen Brothers, of Liverpool.

SCHOOL, RANMOOR, SHEFFIELD.—A new school has been erected at Ranmoor, from the designs of Messrs. Holmes and Watson, architects of Sheffield. When the whole school is completed it will consist of eleven class-rooms, but at present only eight are built, three being left out on the south side for future extension. The entrances to all the departments are from Fulwood-road, two being provided on the east side for the boys, and two on the west for the girls and infants, sloping pathways being provided in preference to steps for the smaller children. There is a central hall, but at present it is divided by a fixed screen glazed with plate-glass, so as to make two large class-rooms. One of the class-rooms has been fitted up as a cooking-room for the girls, a special cooking-range and small pantry, with other fittings, being provided. The four entrances communicate direct with the large hall, but are so arranged as to keep the departments separate. The heating scheme has been carried out by Messrs. Wright Bros., of Attercliffe. Private rooms are provided for the head and assistant teachers. A caretaker's house, with separate yard and outbuildings, is provided near the Fulwood-road. The contract for the erection of the schools has been carried out by Messrs. Wilkinson and Sons, of Heeley.

NEW BOYS' GRAMMAR SCHOOL, BINGLEY, YORKSHIRE.—The Governors of the Grammar School Trust have decided to erect a new school for boys at Bingley, on a site immediately adjoining the present school. Plans have been prepared by Mr. W. R. Nunns, architect, Bingley, for a building providing accommodation for seventy-five boys, at an estimated cost of about 3,600*l*.

PROPOSED NEW BOARD SCHOOL, EDINBURGH.—On the 4th inst. Sheriff Henderson conducted a public inquiry in the Edinburgh School Board Offices at the instance of the Scotch Education Department in regard to the compulsory acquisition of a site for a new school in Upper Gilmore-place. Mr. J. A. Carfrae, the architect, said it was proposed to erect a building to accommodate 1,500 pupils, and in that case the building would require to be three stories.

BAPTIST SUNDAY SCHOOLS, LOUGHBOROUGH.—The new Sunday-school buildings, erected at a cost of about 3,500*l*., in connexion with the Woodgate Baptist Church, Loughborough, were opened recently. The new schools have been built on the site of the old chapel and burial ground, and extend from the new chapel yard through to Southfield-road. The style is late Gothic. The exterior is of sand-stock bricks, from Messrs. G. Tucker and Sons' yards, with terra-cotta dressings supplied by the Hathern Terra-Cotta Company. Messrs. Barrowcliff and Allcock were the architects. The main entrance to the schools is from the chapel yard in Woodgate. Here there are entrances and cloak-rooms for the boys and girls, divided by an office to be used by the secretary and librarian. These entrances lead direct to the assembly hall, a room 52 ft. by 35 ft. It is lighted by clerestory windows on either side, and a tracery gable window at the Southfield-road end. The roof is of open timbering, and a wood panelling extends round the hall to a height of 8 ft. On either side of the hall, and opening directly into it, are classrooms, and the gallery at the chapel end communicates with the old classrooms, making, in all, seventeen of these rooms available for class work. The two class-rooms at the Southfield-road end of the hall are separated by a movable partition, enabling the two to be used together when required. The infant scholars will enter the school from Southfield-road, their room, 28 ft. by 20 ft., adjoining the entrance. Also opening out of the assembly hall is a ladies' parlour, 17 ft. by 15 ft., and a kitchen. A separate entrance from the yard communicates with the kitchen and ladies' parlour adjoining. At the rear of the chapel is a lecture hall, 42 ft. by 21 ft., with open timbered roof and tracery panels. An electric-light installation has been put in ready for the public supply, when that is in operation. The contract for the building was placed in the hands of Messrs. W. Corah and Son.

INFECTIOUS DISEASES HOSPITAL FOR WOODHOUSE AND KIVETON PARK, NEAR SHEFFIELD.—A new infectious diseases hospital has been erected on the Rotherham and Clown High-road, between the villages of Swallow Nest and Aughton. The new hospital consists at present of five blocks—the administrative block, a large three-storied building intended to house the matron and nursing staff, the surgery and dispensary, and other offices; a scarlet fever block, a typhoid fever block, an isolation block, and the laundry. The ward blocks and the laundry are one-storied buildings, placed a sufficient distance apart. The wards and service rooms have mosaic floors, and the wards rounded angles between floor and walls. The walls are uniformly dadoed in chocolate, and painted a neutral green above. For the artificial lighting there is an installation of acetylene gas generators, distributing pipes and burners. The ward accommodation is for thirty-two beds, of which the larger proportion are in the scarlet fever block, and the smaller in the typhoid block. The architect for the hospital is Mr. J. D. Webster, Sheffield.

ALMSHOUSES, YARDLEY.—The new almshouses which have been erected on a site near Yardley Church, Yardley, by the Charity Governors, were formally declared open on the 2nd inst. The houses, six in number, have been erected to replace the old almshouses which adjoin the church. They are self-contained, and comprise a sitting-room, bedroom, scullery, pantry, and outbuildings, all on the ground floor. They have been placed three on each side of a large square grass plot, which is open to the road leading past the church in the direction of Stechford. At the far side of the square, away from the road, is a building comprising a common room, and a dwelling-house for a nurse-matron. The buildings, which have cost 3,000*l*., have been erected by Mr. H. Gregory, of Olton, to the plans of Messrs. Peacock and Bewlay, architects, of Birmingham.

WOMEN'S HOSPITAL, BIRMINGHAM.—On the 20th ult. the foundation stone was laid of a new hospital for the Birmingham and Midland Hospital for Women. The site of the building is situated in Showell Green-lane, Sparkhill. The new hospital will, in the main, be a two-story building of brick. In the centre is the administrative block, having on the ground floor an entrance hall and corridor 7 ft. in width, from which are approached on the one side matron's office and store kitchen, servants' dining-room and kitchen, offices, and stores, and on the other side doctors' room, matron's sitting-room, nurses' dining-room, with pantry and room for patients' visitors. On the first floor, approached by two fire-resisting staircases, are bedrooms for the matron, lady doctors, and other officers, servants' cubicles, sick-room, linen-room, with bathroom annexe for officers in the centre, and for servants at each end of the corridor. A few rooms for servants are also provided on the second floor. At the back of the administrative block are placed four ward units, two on each floor, having a total provision for forty-eight beds, and which are approached on the ground floor by a central corridor from the administrative block. Leading out of the corridor are a dispensary, surgical store, store-room for patients' clothes whilst they are in the hospital, sewing-room, mattress store, and a sitting-room for the sister in charge of the floor, with an easy-going fire-resisting staircase, enclosing an electrically-worked lift, capable of taking a patient in bed, attended by nurses. The staircase and lift run from the basement to the first floor. On the first floor, immediately opposite the lift, is the operating department, consisting of an anæsthetic room, two operating-rooms, and sterilising-room, and a sitting-room for the sister in charge. Each ward unit contains an associated ward for ten beds, with an isolation ward for two beds, duty-room, pantry, a room for washing mackintoshes, and two sanitary annexes placed cornerwise, with balcony between, from which there is a fire escape staircase to the ground, and also a bathroom placed near the main staircase in which patients will be received before being taken into the wards. The ward buildings are to be constructed on piers and arches allowing of a free air space below the ground floor under the whole area of the buildings, as a protection against damp and ground air. A narrow balcony will run along each side of the wards on the first floor, giving patients an opportunity of sitting in the sun, and also affording a means of cleaning the windows on the outside. The wall and ceiling surfaces throughout these buildings will be painted with a special enamel paint on plaster, and care is being taken, as far as possible, to avoid corners for the harbouring of dirt. At the south end of the administrative block is placed a detached nurses' home containing, on three floors, twenty nurses' bedrooms, three sisters' bedrooms, sick-room, and, on the ground floor, a recreation-room, small kitchen and pantry, bathrooms, etc., and a staircase at the end of the corridor. At the north end of the administrative block is a detached building for the laundry and engineering departments containing, on the basement floor, boiler and engine room, fitted up with complete plant for an electric-lighting installation, together with room for accumulators and steam disinfecting-room; on the ground floor there are a wash-house and a laundry, with up-to-date machinery, and delivery and receiving rooms; also a mortuary consisting of post-mortem room and friends' waiting-room. The administrative, ward, and laundry buildings are connected below ground by a subway in which will be carried the steam, water, and gas mains, and electric cables. The convalescent home will be a two-story building, containing on the ground floor an entrance and corridor leading to the day-room, dining-room, matron's sitting-room, kitchen with larder, pantry, and scullery, and also a room for patients' clothes, bathroom, etc. On the first floor there will be two dormitories for patients, each containing five beds, two for two beds, the matron's bedroom, linen-room, and sanitary annexe. There will be from the first to the ground floor an external iron fire escape staircase. The architects are Messrs. Martin and Martin, of Birmingham. The builder is Mr. C. Gray Hill, of Coventry; and the clerk of works Mr. Frank Hopkins.

ALTERATIONS TO THE IMPERIAL HOTEL, DUBLIN.—The alterations to the Imperial Hotel in Lower

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Sackville-street, Dublin, have now been completed. The general contractors for the building were Messrs. H. and J. Martin, Ltd., Grand Canal-street; sanitary fittings, cooking, and heating are by Messrs. W. Baird and Sons, Lower Abbey-street; the ceramic mosaic was executed by Messrs. G. Wolliscroft and Co., Hanley; the steel bridge, life enclosure, wrought iron, and balcony, and ornamental ironwork over entrance were manufactured by Messrs. J. and C. M'Gloughlin, Ltd., Dublin; the electric installation is by Messrs. W. Coates and Sons, of Dublin and Belfast; and the lift is by Messrs. Waygood. It is intended to erect a canopy over the hotel entrance, and this is in the hands of Messrs. Fagan, of Dublin. The painting and decorations throughout have been executed by Messrs. W. Sibthorpe and Sons, Dublin. The work has been executed from the designs and under the supervision of Messrs. Ashlin and Coleman, architects, Dublin.

PUBLIC BATHS, OLD TRAFFORD, MANCHESTER.—At Old Trafford the formal opening took place recently of the baths which have been built by the District Council of Stretford. The new building is in Northumberland-road, and Mr. Ernest Woodhouse, of Manchester, was the architect, Mr. William Thorpe, of Cornbrook, being the builder. The new buildings comprise a swimming bath for men and one for women, as well as provision for douche, vapour, and warm baths. In the construction of the men's swimming bath the architect has made provision for the accommodation of the public on gala nights. The principal bath is 75 ft. by 30 ft.

BATHS, LIVERPOOL.—The members of the Baths Committee of the Liverpool Corporation made, on the 2nd inst., their annual inspection of some of the public baths and washhouses under their control, and opened a new bath in Lister-drive, Green-lane. The site in Lister-drive extends to 6,000 sq. yds. of land, and the buildings cover 1,986 sq. yds. The building line is set back on the Lister-drive frontage a distance of 100 ft. The building has a red stone base, the superstructure being faced on the principal elevations with red pressed bricks with white stone dressings. The baths are approached from an entrance on the Lister-drive front. From the entrance hall there is direct access to the several sections and classes of baths, which are all situate on one floor level. Each section has its waiting and cooling-rooms. The first-class accommodation provides for eight private baths, slippers, sprays, Russian, and vapour baths, and a swimming bath 60 ft. by 30 ft., having dressing accommodation for fifty to seventy-five bathers. There is a balcony at one end. The plunge bath is designed so that it may be used as a gymnasium during the winter months. The second-class accommodation provides for fifteen private baths, slippers, sprays, Russian, and vapour baths, a swimming bath, 75 ft. by 35 ft., with dressing accommodation for seventy-five to 100 bathers. This bath is designed for an entertainment bath, but for the present the necessary spectators' gallery has been omitted. The ladies' section is capable of accommodating six bathers. Space has been reserved for the construction of a ladies' swimming bath when the demand justifies such a provision. A bicycle stable is provided for the storage of bathers' bicycles. There is also a room for swimming-club meetings. The administrative department includes a power-driven laundry and complete installation of up-to-date heating appliances, both for atmospheric and water heating. A superintendent's house is attached to the building. All the baths are top-lighted. The artificial lighting is electric, the current being supplied from the Corporation mains. The interior of the walls are faced with enamelled bricks, tiles, and faience. The water-supply is from the Corporation's fresh water mains. The total cost of the establishment of the baths is 24,000*l*. The establishment was designed by and constructed under the supervision of the baths' engineer and chief superintendent, Mr. W. R. Court, who had the Corporation surveyor (Mr. Thomas Shelmerdine) associated with him in the external architectural treatment of the building. Mr. Isaac Dilworth, of Wavertree, executed the building contract, and Messrs. Thomas Bradford and Co., the engineering contract. The electrical equipment was carried out by the Corporation Electric Power and Lighting Committee.

BOYS' HOME, NOTTINGHAM.—A new home for boys has been opened in Cranmer-street, Nottingham, as a memorial to General Gordon. It has been built to the plans of Mr. Ernest R. Sutton, and is designed to accommodate eighty boys. On the basement floor are cloak-rooms, bathroom, day lavatories, boot-cleaning and brushing rooms, while on the ground floor there are the dining-hall, capable of accommodating 400, with kitchen, scullery, plates, dishes, and washing-up room adjoining. The committee room and waiting room are situated on the south side of the main entrance from Cranmer-street, and the office and master's and matron's rooms on the north. The first and second floors are devoted to dormitories and bedrooms for the boys and the staff, with bathroom accommodation, and there is a hospital on the second floor, with separate offices. Low-pressure hot-water pipes and radiators are utilised for heating, and ventilation flues and extractors for the internal ventilation. The staircases are of stone throughout, and a fire-escape staircase is provided from the dormitories. In the yard there are bath-chair, cart, and barrow houses, and the usual out offices, and a play and drill ground are provided. Externally the walls of the home are of red brick with Derbyshire stone dressings.

PUBLIC-HOUSE, SHEFFIELD.—The Sheffield Corporation, in carrying out their scheme for widening Westbar, Gibraltar-street, and Infirmary-road, had to deal with a lot of licensed property, and the City Council decided to allow over a dozen licences to lapse. All these were situate on the main road. The "George IV." was one of those preserved, and the site was secured by a number of gentlemen who formed themselves into a public-house trust company. The new house has been erected by Messrs. Ash, Son, and Biggin, to designs drawn by Mr. H. I. Potter, Sheffield. The new building is divided into two parts, one for the purposes of the hotel, and the other for private apartments and conveniences for the manager. The corridors and staircases are provided with glazed brick dados, and many of the floors are mosaic, laid by Messrs. Hodkin and Jones.

BUSINESS PREMISES, NORWICH.—Building operations have just been commenced on a new block of offices in Orford-place, Norwich. The architect is Mr. J. Owen Bond, and the contractor Mr. T. Gill, both of Norwich.

ALTERATIONS, LEEDS TOWN HALL.—In order to provide better accommodation for the town clerk's staff at the town hall, Leeds, it is proposed to utilise the lead flat adjoining the corridor of the West Riding police-court and the upper portion of the Victoria Hall. A plan has been prepared by the City Engineer, Mr. Thomas Hewson, and approved by the Corporation, which provides three offices, with two entrances, one from the corridor adjoining the West Riding police-court and the other from the corridor leading to the gallery. The rooms will be divided by pitch-pine woodwork and glass, and a north light will be obtained by the City Engineer's scheme. The roofing will be supported by girders carried on existing walls inside the building.

CARRICK HOUSE, BELFAST.—The new wing which has been added to Carrick House, Belfast, was opened on the 9th inst. The new building stands on a site in Unity-street, and provides sixty-eight additional cubicles. Messrs. M'Dowell, Leathem, and Fraser, Belfast, were the general contractors; the heating arrangements were entrusted to Messrs. Musgrave and Co., Ltd. Mr. Richard Kernaghan was responsible for the sanitary arrangements; Mr. J. Bradin put in the electric wires; and Mr. J. B. Nelson supplied the asbestos covering for the boilers. The work has been carried out from the plans of Mr. James Munce, the assistant City Surveyor.

BUSINESS PREMISES, SHEFFIELD.—New business premises are in course of erection on a site at the corner of Church-street and Orchard-street, Sheffield. The new building is of brick with stone dressings. Messrs. Gibbs and Flockton are the architects, and the contractors are Messrs. Dawson, Jones, and Co.

NEW HOME FOR THE BLIND, SOUTHPORT.—The foundation stone of a Home for the Blind, which is to be erected in Roe-lane, Southport, was laid recently. Mr. John Brooke is the architect, and the cost of the work will be about 5,500*l*.

CO OPERATIVE BRANCH, WINLATON, NORTHUMBERLAND.—A new branch of the Blaydon Co-operative Society has been opened at Winlaton. Messrs. Davidson and Bolam, of Blaydon, were the principal contractors for the work, the architect being Mr. F. M. Dryden, of Newcastle.

WORKHOUSE HOSPITAL, BURY.—At Bury, Lancashire, on the 12th inst., Councillor David Healey, of Heywood, and Councillor James Cunliffe, of Radcliffe, laid the memorial stones of a new hospital wing to be erected by the Bury Union at their workhouse. The new hospital scheme is estimated to cost 30,000*l*., and provides for 200 patients. At present only the administration block and two pavilions are being erected, finding accommodation for 126 infirm persons and seventeen nurses. Mr. A. Hopkinson is the architect.

DRINKING FOUNTAIN, BROCKWELL PARK.—The London County Council has given permission for the erection of a drinking fountain in Brockwell Park, to the memory of Alderman S. Horace Candler, Vice-Chairman of the recent extension scheme, who died shortly after the 42½ acres were rescued from the builders' hands. Mr. C. E. Tritton, M.P., Chairman, and Mr. Albert Larking, Hon. Secretary, of that scheme, have the matter in hand, with Mr. W. C. Parsons, of 51, Loughborough Park, the Treasurer. The fountain is to have a circular grey granite base, surmounted on two octagonal steps, with four red granite columns above, and furnished with Portland stone pediments. There will also be side panels with inscriptions engraved thereon, and one with a portrait medallion of Mr. Candler in bronze. It has been designed and will be carried out from drawings prepared by Mr. Arthur W. Shepnard, architect, by Messrs. J. Whitehead and Sons.

NURSES' HOME, TROON.—On the 16th inst. the new home, erected at a cost of 1,300*l*., in Barassie-street, Troon, for the nurses of Troon District Nursing Association, was opened. Mr. Hay was the architect for the building. The home is a two-story building, and is provided with accommodation for two nurses, dispensary, etc.

WORKMEN'S INSTITUTE, WATERSIDE, AYR, N.B.—A new workmen's institute has been opened at Waterside. The new building occupies a central site in the village, on rising ground. It has been designed with steep pitched roofs and overhanging eaves and gables, and the lower sills are of red pressed brick, the upper walls finished in rough cast of a cream yellow tint. The two sections of walls are divided by a moulded stone course, which is returned round under the windows, forming a sill course. The step roofs are covered with light sea-green slates, finished with red tile ridges, and the whole external woodwork has been painted in a soft green shade. The building has been designed and erected under the superintendence of Mr. John B. Wilson, architect, Glasgow, and the work has been executed by the following contractors:—Mason and brick, Mr. J. M'Connachie, Dunaskin; wright, Mr. Quintin Clark, Ayr; plumber and slater, Messrs. Auld and Sons, Ayr; plasterer, Mr. Falconer Elder, Kilmarnock; painter, Mr. William Anderson, Kilmarnock; electric lighting, Messrs. Mavor and Coulson, Glasgow.

STAINED GLASS AND DECORATION.

WINDOW IN THE INDUSTRIAL HALL, BRADFORD EXHIBITION.—In the west window of the Industrial Hall of the Bradford Exhibition a stained-glass window representing a figure symbolical of labour has been placed. The figure is 10 ft. high, and the span of the wings 35 ft. The colouring is in a scheme of ruby, blue, and green. The window was executed by Mr. W. Pope, of Leeds, from a design supplied by Mr. Arthur Louis Duthie.

MEMORIAL WINDOW, ALFRISTON, SUSSEX.—A stained-glass memorial window, which has been placed in the parish church of Alfriston, was recently unveiled. The window consists of a central figure representing the glorified Christ, supported by four figures of saints in the principal lights. The window is the work of Messrs. James Powell and Sons, of London, after a design of Mr. Charles E. Powell, architect, also of London.

PRESENTATIONS.

TO MR. HOWARD COLLS.—The important ancient lights case of Colls *v.* the Home and Colonial Stores, Ltd. (which was decided in the plaintiff's favour in the House of Lords on the 2nd inst., and reported in the *Builder* on the 7th and 14th insts.), has attracted considerable public attention. The first substantial recognition of Mr. Colls's public spirit in the matter has come from the Institute of Builders, of which Mr. Colls is a member, in the form of a massive silver-gilt Georgian bowl, with a suitable inscription. The presentation was made without ceremony at Mr. Colls's private residence.

TO MR. LOWRY.—At the Queen's Hotel, Stockton-on-Tees, recently, Mr. Wilkinson, President of the Northern Counties Federation of Building Trade Employers, on behalf of that body, presented Mr. Walter Lowry, of the firm of Messrs. J. and W. Lowry, of Newcastle, with a silver and gold bowl and stand in appreciation of the great services rendered by him to the building trade for many years, as well as a mark of the esteem in which he is held by the employers of the North of England. Mr. Walter Lowry (who is the eldest son of the late Mr. John Lowry) was for eight years President of the Newcastle, Gateshead-on-Tyne District Building Trade Employers Association, and resigned that position last year. He has also been twice President of the Northern Counties Federation of Building Trade Employers, as well as occupying the presidential chair of the Northern Centre of the National Federation of Building Trade Employers of Great Britain and Ireland.

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SANITARY AND ENGINEERING NEWS.

THE GREENLAND DOCK, ROTHERHITHE.—On the 3rd inst. the new Greenland Dock at Rotherhithe, the property of the Surrey Commercial Dock Company, was opened. The works, which were begun in 1894, comprise the new Greenland Dock, the construction of a lock and entrance from the river, a communication passage from the south-east corner of the Canada Dock into the new dock, the extension of the Russia Dock southwards, and the construction of a passage from that dock into the new dock, a new canal lock, and the formation of a basin by widening the canal. The new dock is 2,250 ft. in length by 450 ft. in breadth, covering an area of about 22 acres, with quays 5,380 ft., or upwards of a mile, in length. The entrance lock is 550 ft. in length, 80 ft. in breadth, and has a depth of water on the sill of 33 ft. below T.H.W. The new dock will not be accessible to vessels of the largest class it is designed to admit until the necessary further deepening of the river shall have been carried out. The original plans for the works were prepared by the late engineer of the Company, Mr. J. A. McConochie, M.Inst.C.E., who died before any substantial progress with the works had been made. The Company subsequently entrusted the supervision and control of the works to Sir J. Wolfe Barry. Having in view the possible future requirements of the trade of the Port, the directors, with the advice of Sir J. Wolfe Barry, modified and extended their original plans, increasing the proposed width of the dock by 100 ft. and the length and depth of the entrance lock. Nearly a million sterling has been spent on these improvements. Messrs. S. Pearson and Son, Ltd., were the contractors for the whole of the works, and the construction of the lock gates, bridges, and hydraulic machinery was carried out by Sir W. G. Armstrong, Whitworth, and Co.

WATER SUPPLY, HONITON.—Mr. R. H. Bicknell, M.Inst.C.E., held an inquiry, on the 6th inst., for the Local Government Board, with respect to an application of the Honiton Town Council for sanction to borrow a further sum of 1,150*l.* in connexion with their new waterworks on St. Cyres Hill. It was stated that the population of the town was 3,400. The ratable value was 15,916*l.*, the total rates being 7s. 6d. in the pound. The Clerk said the plans were sanctioned on July 17, 1902, and the tenders were invited. Twenty-one were received, and the one accepted was that submitted by Mr. Gibson, Exeter. It was found that with extras the sum of 5,200*l.* was required for the work.

MISCELLANEOUS.

QUEEN VICTORIA MEMORIAL, BRADFORD.—The statue of Queen Victoria was formally unveiled on the 4th inst. The work was placed in the hands of Mr. Alfred Drury, A.R.A., and the committee who had to deal with the matter came to the conclusion that the idea of fountains and a basin should be abandoned, and that Mr. J. W. Simpson, of London, the architect who was then carrying out the erection of the Cartwright Memorial Hall, should be associated with Mr. Drury in the matter to design some architectural work surrounding and leading up to the large bronze figure of the Queen. The statue is of bronze, and represents the Queen in her robes of state as she appeared about 1887. Her Majesty holds in her hands the sceptre and globe, and she wears a small imperial crown. A widow's veil falls back over her ermine collar. The pedestal rises a few feet above the level of the land immediately behind it, and there is a considerable fall to the level of the ornamental gardens at the foot of the monument. This sudden fall in the ground level has been utilised by Mr. Simpson in the effort to secure dignity for the surroundings of the monument. Short walls run out as wings on either side of the pedestal, terminating in vases, and a short staircase on either side descends to the gardens, where a portion is enclosed within a wall semi-circular in shape, or, rather, segmental, for the semi-circle is not quite complete. On either side of the monument and its architectural surroundings are placed two lions. They are the work of Mr. A. Broadbent, who executed the decorative sculpture at the Cartwright Hall.—*Yorkshire Observer.*

LIVERPOOL ARTISANS' AND LABOURERS' DWELLINGS.—The returns submitted to the Corporation Housing Committee on the 29th ult. by the manager, Mr. John Taylor, now appear in pamphlet form. They give the following among other particulars:—During 1903, 353 additional tenements were completed and opened, providing accommodation for 1,706 persons, thus bringing the aggregate number of tenements to 1,276 (with thirteen shops), capable of accommodating 5,868 persons. The total gross annual rental amounted to 12,564*l.* 5s. 4d., as compared with 8,809*l.* 0s. 8d. on December 31, 1902. The total receipts for 1903 amounted to 10,231*l.* 0s. 5d., of which 9,586*l.* 15s. 8d. was actually collected from the tenements alone, being equal to 95·68 per cent. The average collection from Victoria-square, Juvenal-dwellings, and St. Martin's-cottages was 99·37 per cent., while the average collection from the other dwellings reserved for housing those persons dispossessed, was 93·40 per cent. The total amount lost through empties (inclusive of new dwellings during the year and a number of which were empty for some time after completion) was 1,001*l.* 5s. 6d., equal to 8·88 per cent. of the total rental value. The total expenditure for 1903 amounted to 5,297*l.* 13s. 4d., the details of which are as follows, viz:—Supervision and collection of rents, 539*l.* 1s. 8d.; rates and taxes, 1,934*l.* 7s.; gas and lighting, 529*l.* 19s. 1d.; ground rents, 137*l.* 12s. 8d.; stores, repairs, new work, cleaning, etc., 1,956*l.* 4s. 3d.; fire insurance, 112*l.* 4s.; incidentals, 108*l.* 4s. 8d. The returns also convey a great deal of detailed information as to the classes of people inhabiting the tenements, etc.

CAPE COLONY IMPORTS.—Official statistics show that the imports into Cape Colony in the month ended January 31, 1904, included cement, 7,000*l.*; paints and colours, 8,000*l.*; and wood and manufactures of wood (including furniture and cabinetware), 208,000*l.* The corresponding figures for January, 1903, were 13,000*l.*, 12,000*l.*, and 195,000*l.* respectively.

STREET POSTS IN LONDON.—We observe that the wooden posts at the south end of Great Turnstile, High Holborn, where the footway opens into Lincoln's Inn-fields, have just been reconstructed so that they may be turned upon hinges and laid level with the pavement in a case of emergency. We gather that this has been done in view of the recent fatal fire in the City to which immediate access by a fire engine or escape was obstructed by some posts, and that the same precaution will be adopted in other places where a similar obstruction now exists.

THE CONDITION OF DURHAM CASTLE.—For some considerable time past, it is stated, portions of Durham Castle have shown signs of decay, and, although measures have been taken from time to time to arrest the progress of the mischief, matters have now arrived at such a crisis that it has been deemed wise, on the part of the University authorities, to call in the services of an architect to examine and report. The services of Mr. T. G. Jackson have been secured, and he is now engaged in making an examination into the condition of the foundations of the Castle.

THE CITY SURVEYORSHIP.—The resignation is announced of Mr. Andrew Murray, Surveyor to the Corporation of the City of London, who will retire upon a pension, having attained the limit of age. Mr. Murray entered the service of the Corporation fifty years ago, and, in June, 1899, was elected a Fellow of the Royal Institute of British Architects, having been elected an Associate in 1872. As City Surveyor he carried out many important architectural works for the Corporation, comprising the new City of London Court, near the Guildhall, in 1887-8, of which we published illustrations on December 24, 1887, and which he enlarged in 1893; the Weights and Measures Offices, Guildhall, 1893; the Ward's City of London School for Girls, on Victoria Embankment, 1892-3, having accommodation for 400 pupils; the City police-station, in the Minories, opened in October, 1897; the extension, to include thirty classrooms, of the Guildhall School of Music, in Whitefriars, 1897-8, at a cost of about 21,000*l.*, the school having been first built after the late Sir Horace Jones's designs; an extensive enlargement, in 1898-1901, at a total outlay of 250,000*l.*, of the City of London Asylum, at Stone, near Dartford; the extensions at the Deptford Foreign Cattle Market, together with the new pier and lairages, having a river frontage of 900 ft., also the chill-rooms, cooling-rooms, slaughter-houses, tripe-boiling houses, and so on, for which, begun in 1896, the expenditure has amounted to some 155,000*l.*; the City Mortuary, in Golden-lane, the Shelter, and other buildings, 1899-1900; the Sanitary Hospital, at Denton, near Gravesend, for the Port of London, with the water-tower; the police-station in Moor-lane, E.C., with quarters for sixty-seven constables, clothing store department, and other offices; and, in conjunction with Mr. E. Cruttwell, M.I.C.E., the recent widening of London Bridge. Mr. Murray made the designs for the crematorium at the City of London Cemetery, Little Ilford; the Queen Victoria Memorial, on Victoria Embankment, which also marks the City boundary there; and the restoration, four years ago, of the porch of the Guildhall, erected in 1425. In February, 1899, he was appointed, together with Professor Aitchison, to draw up the instructions for the guidance of the six architects nominated to compete for the new Sessions House and Central Criminal Courts in Old Bailey. Four years ago he made the plans for rebuilding, now in progress, upon the John Carpenter estate belonging to the Corporation on the sites of Alfred-place, the two circuses, and the vicinity, lying between Gower-street and Tottenham Court-road, as originally laid out by George Dance, the younger. After the death of Mr. F. M. Peebles, on May 21, 1891, the titular office of Architect to the Corporation was abolished.

PROPOSED WORKMEN'S DWELLINGS, SHEFFIELD.—On the 11th inst., at the Town Hall, Sheffield, Mr. F. H. Tulloch, Local Government Board Inspector, held an inquiry with reference to the scheme of the Sheffield Town Council for providing a certain number of new dwellings on a site in Clough-road and Edmund-road, and the Council's application to the Board for sanction to borrow the sum of 23,000*l.* for the purposes of the scheme. Mr. W. E. Hart, the Deputy Town Clerk, explained that the scheme was to provide new dwellings for a number of persons of the labouring class, who had been displaced by reason of street widenings, necessitated by tramway extensions, and by the natural growth of the city, and carried out under the powers of the Sheffield Corporation Acts of 1897 and 1900. It was thought that the provision of seventy houses would be sufficient. Difficulty had been experienced in acquiring a site which should be sufficiently central, and obtained at a sufficiently reasonable price. The Clough-road and Edmund-road site had eventually been bought. The area of the land was 8,200 sq. yds., and the price of the purchase, 5,842*l.* 10s., thus averaging about 14s. 3d. per yard. In addition to this, 151*l.* 10s. had to be paid for flagstones and sewers in the adjoining streets, which had been put in by the vendor previous to the purchase, and there were certain other sums, which made a total capital outlay on the land of 6,121*l.* 10s. 6d. The Council proposed to erect four classes of houses. The plans were submitted by the City Surveyor, Mr. F. C. Wike, who said that the estimated cost for the buildings was 15,038*l.* He pointed out, in referring to the site, that the roads were very much higher than the adjoining land. The depth below the road would be about 6 ft., and, therefore, it was necessary to take the foundations a good deal deeper than would have been necessary in ordinary circumstances with cottages of a similar kind. The foundations, however, had been availed of to make coal cellars and larders larger than usual. Each house had a separate yard. The extra foundations added 20*l.* a house to the cost of the houses. Besides, not only had the Council to comply with the Local Government Board requirements and the by-laws, but there were obligations to the vendor with regard to certain building lines and forecourts. In reply to a question, Mr. Wike said the site was the only one the Council could get. It was not one they would have selected if they had been given a freer choice. There were about 87 sq. yds. to each house, and the inclusive cost for each house was about 320*l.* The rent was not yet settled.

CAPITAL AND LABOUR.

A SCHEME TO AVOID STRIKES IN THE BUILDING TRADE.—The Yorkshire Federation of Building Trade Employers have, during the past six months, been considering the best methods of putting a stop, once and for all, to the system of settling labour disputes by strikes and lock-outs, and they have submitted to employers and employees a "Closer Union Scheme." During the past two months correspondence relating to the scheme has been passing between the Yorkshire Federation and the headquarters of trade unions representing the Operative Bricklayers' Society, the Manchester Unity of Operative Bricklayers, the Trade Accident, Sick, and Burial Society, the Amalgamated Society of Carpenters and Joiners, the General Union of Operative Carpenters and Joiners, and the Operative Stonemasons, and it has been well received. The initial stage of the negotiations was brought to a practical test on Monday, when a committee of employers, appointed by the Council of the Yorkshire Federation, met an equal number of representatives (two from each section of the trades) in conference at the North-Eastern Station Hotel, York. The questions at issue were thoroughly discussed in a friendly and harmonious spirit on both sides for nearly three

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hours. Mr. E. Good, of Hull, President of the Federation, occupied the chair, supported by Mr. T. Marsden and Mr. J. Townsley (promoters of the scheme), and Mr. W. T. Wilson, of Manchester, representing the Amalgamated Society of Carpenters and Joiners. The scheme, which contains five clauses, was practically agreed to unanimously, and it will be finally considered in June next after a plebiscite of the whole of the operative members interested has been taken.—*Yorkshire Post.*

Legal.

POINT UNDER THE LONDON BUILDING ACT.

THE case of the London County Council *v.* The Illuminated Advertisements Company came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Wills and Kennedy, on the 13th inst., on the appeal of the London County Council from a decision of Mr. Plowden, the stipendiary.

It appeared from the special case which had been stated that the County Council charged the Company before the magistrate with unlawfully erecting certain structures beyond the general line of buildings without the consent of the Council in writing. The Company, in 1893, erected on the front walls of 48, Cranbourn-street, twelve advertisement cases, constructed of sheet iron, supported by iron supports, cut and pinned through the front walls of the buildings. The outer side of each of the cases was covered with a wooden frame carrying canvas or linen with advertisements, and provision was made for illuminating the interior of the cases by electric light. The cases varied in width from 2 ft. to 5 ft., and in height from 5 ft. to 7 ft. Each of the cases stood out 10 in. in front of the front wall of the building, but such projection was less than the projection of the existing cornice over the shop, which was 2 ft. from the face of the building. The front of each of the cases was about 10 in. beyond the general line of buildings as determined by the certificate of the Superintending Architect of Metropolitan buildings. The Company had not obtained the consent of the Council to the erection of the cases, and the latter body contended that the cases being so fixed and supported were structures within sections 22 and 200 (3) of the London Building Act, 1894, and that the Company became liable to the penalty prescribed by section 200 (3) of the London Building Act, 1894, as amended by the London Building Act (1894) Amendment Act, 1898. The Company contended that the cases were not structures within the Act. The magistrate held that the cases were not structures within the Act, but were excrescences which could be removed without injury to the fabric, and they could not be said to be a "bringing forward" of the main building, as was contemplated by the statute. He accordingly dismissed the summons. Hence the present appeal.

At the conclusion of the arguments of counsel the Lord Chief Justice and Mr. Justice Kennedy held that the point for decision was a question of fact and of degree in each case for the magistrate to decide, and he had decided that the cases were not structures within the Act. They could not say that he was wrong in law in holding that the cases were not structures within the Act.

Mr. Justice Wills differed. He did not think that the magistrate intended the court to deal with the case as if he had found as a fact that the cases were not structures. His lordship could not help feeling that, as long as the cases remained annexed to the building they formed part of it, although they could be removed.

By a majority of the court, therefore, the appeal was accordingly dismissed.

Mr. Horace Avory, K.C., and Mr. Daldy appeared for the appellants, and Mr. Macmorran, K.C., and Mr. Holden for the respondents.

POINT UNDER THE METROPOLIS MANAGEMENT ACT, 1855.

ON the 9th inst., before a divisional court of King's Bench, composed of the Lord Chief Justice and Justices Wills and Kennedy, the hearing of the case of the New River Company *v.* the Mayor, etc., of Westminster, was concluded on the company's appeal from a decision of Mr. Bros, the Metropolitan Stipendiary.

The matter came before the court in the form of a special case, from which it appeared that the company were summoned before the magistrate by the respondents for neglecting to pay a certain sum alleged to be due to the respondents for expenses incurred in filling, making good, and maintaining the pavements in streets in Westminster, when the same had been broken up by the company in pursuance of its statutory powers to execute work in the City of Westminster. The sum which the respondents claimed included a charge of 10 per cent. on the cost of the work, to cover the respondents' estimate of the expense to which they had been put for superintending the work during its execution by a contractor. The company's contention was that, by virtue of section 114 of the Metropolis Management Act, 1855, the respondents were not entitled to make any charge for supervision or superintendence, notwithstanding that it was given, and that the same formed part of the general administrative duties of the respondents. The respondents, on the other hand, contended that the employment of officers to superintend and supervise such work was a necessary expense incurred by the Corporation in carrying out the work of reinstatement. The magistrate came to the conclusion that the respondents were entitled to recover a sum for the exponses incurred in respect of the supervision or superintendence of the work, but he reserved the question of amount, and as to how it should be calculated, pending the opinion of the High Court as to whether the respondents were, in law, entitled to make any claim in respect thereof.

At the conclusion of the arguments of counsel, the Lord Chief Justice, in giving judgment, after going through the various Acts of Parliament bearing on the subject, said that, dealing with the matter in a practical way, he was of opinion that all work properly done in reinstating the street came within the meaning of expenses. The magistrate had held that the respondents were entitled to recover the expenses in question, and his lordship saw no reason for interfering with his decision.

Justices Wills and Kennedy concurred, and the case was remitted to the magistrate for him to determine the amount to which the respondents were entitled.

Mr. Courthorpe Munroe and Mr. E. Jelf appeared for the appellant company, and Mr. Morton Smith for the respondents.

ARCHITECT AND SURVEYOR'S ACTION FOR FEES.

THE case of Stenning *v.* J. Mitchell and Co. came before Mr. Justice Farwell, sitting as an additional Judge of the King's Bench Division, on the 11th inst., an action by the plaintiff, Mr. A. R. Stenning, an architect and surveyor, for 166*l.* 19s., fees for services rendered to the defendants in connexion with the taking over by the London County Council of property belonging to the defendants in Drury-lane under the Lands Clauses Acts.

Mr. H. F. Dickens, K.C., and Mr. H. Smith appeared for the plaintiff, and Mr. Ernest Pollock for the defendants.

It appeared from the statement of Mr. Dickens that in 1900 the defendants, on receiving notice to treat under the Act, retained the plaintiff as their leading surveyor, so that he should have the conducting of the matter throughout. Negotiations continued from February, 1900 to 1902, but afterwards the parties went to arbitration, and in March, 1902, the arbitrator issued his award, awarding Messrs. J. Mitchell and Co. 18,195*l.* compensation. According to Ryde's scale, plaintiff's fees for his ordinary duties as a surveyor in the case amounted to 109*l.* 4s. It was admitted, however, that, apart from the ordinary work which surveyors usually did in these cases, the plaintiff did a large amount of extra work, for which he made a charge of fifty guineas.

The plaintiff gave evidence that his charges were reasonable and proper in the circumstances, and called Mr. George Wilkinson, a member of the firm of B. A. Wilkinson and Son, surveyors, of 7, Poultry, E.C.; Mr. B. A. Breach, a member of the firm of Fairbrother, Ellis, and Co., of Fleet-street; and Mr. H. A. Hunt, a surveyor, all of whom said that the plaintiff's charges were reasonable, having regard to the work he did and his eminence in the profession.

The defence was that plaintiff's charges were unreasonable, and defendants paid a sum of money into court as being sufficient to meet the plaintiff's claim.

Defendants called no evidence, and, counsel on both sides having addressed the court, his lordship, in giving judgment, said the question for decision was one purely of fact on the circumstances of the case—viz., what was a fair and reasonable remuneration to be paid to the plaintiff by the defendants for his services. No custom was alleged, nor was any express agreement stated or proved, nor, so far as he had heard, was Ryde's or any other scale mentioned when plaintiff was engaged. Nothing was said about remuneration. Ryde's scale had certainly not been established as the customary scale upon which surveyors could insist upon receiving. He thought he might say it was a scale which surveyors usually desired to receive. In the present case, what he had to consider was a reasonable amount to give the plaintiff. To some extent he quite agreed it was very undesirable to pay by percentage on the amount, but, owing to the exigencies and the difficulties of business, it was the practice usually adopted by the court in taxation. So that he was bound to accept that as the proper mode of ascertaining remuneration. It did not at all follow that, because he thought that in this case Ryde's scale applied, it was always applicable. Far from it. He had to consider the work done in each particular case. In the present case there were three heads of work to be considered—first, there was the ordinary work done by the surveyor witness; secondly, there was the work which he did in a *quasi* consultative capacity in preparing the evidence, advising, negotiating, and trying to settle so as to avoid litigation; thirdly, there was work which the plaintiff did in connexion with alternate sites suggested instead of money compensation. Three sites were proposed by the London County Council and one by the plaintiff, and these were advised on by the plaintiff. As regarded the preliminary advising and the ordinary surveyor's evidence at the arbitration, having regard to the special circumstances of the case and to the length of time to which the matter extended, his lordship thought a reasonable sum to allow the plaintiff on that head was that specified in Ryde's scale. For the extra work which the plaintiff had done, he allowed forty guineas more.

Judgment for the plaintiff accordingly.

ACTION AGAINST A CONTRACTOR.

IN the Court of Appeal, composed of the Master of the Rolls and Lord Justice Romer, on the 9th inst., Mr. Clavell-Salter, K.C., applied *ex parte* on behalf of the defendant in the case of the Teignmouth District Council *v.* Slocum for leave to appeal from an order made by the Judge in Chambers affirming the Master, referring the action to Mr. Hemming, the Official Referee, the defendant desiring to have the action tried before a Judge and jury at the next Exeter Assizes. The learned counsel said that in 1898 the defendant had a contract to reline the reservoir at Teignmouth. He did the work under the supervision of the plaintiffs' engineer, and he apparently was satisfied with the work and gave the defendant the usual certificate on completion, and the defendant was paid. In October last defendant received a letter from the clerk of the District Council saying that it had been found that the work had been scamped. There was a clause in the contract which enabled the plaintiffs to reopen the matter at any time, notwithstanding the certificate for completion. The plaintiffs then brought the present action against the defendant for damages amounting to something over 2,500*l.* There was no charge of fraud against the defendant, but the allegations of the plaintiffs were that the concrete was not of the thickness shown on the plans, that the concrete was of bad quality, that the bricks used were of bad quality, and that the reservoir was not water-tight. The contract, which was in writing, had been verbally altered from time to time. It must be assumed, said the learned counsel, that the reservoir leaked, but the defendant's case was that that was not due to bad workmanship or to the use of bad materials, but was due to the soil in which the reservoir was made. He submitted that the defendant was entitled to have the case tried before a Judge and jury at the next Assizes at Exeter, which would be more speedy and less expensive than an inquiry before the Official Referee.

In the result, their lordships held that they could not interfere with the discretion exercised by the Judge and Master, and dismissed the application.

DEFINING A SCAFFOLD.

AT the Hull County Court on the 27th ult. his Honour Judge Raikes, K.C., sitting as arbitrator under the Workmen's Compensation Acts, heard a case of importance to the building trade.

The applicant, William Young Wrightson, for whom Mr. W. C. Dawson appeared, claimed compensation from Mr. Frank Southern, of Wright-street (who was represented by Mr. W. H. Owen, barrister-at-law, Hull, instructed by Messrs. Barker and Mayfield), in respect of injuries sustained by him in consequence of an accident which happened on August 31st last year.

Mr. Dawson, for the applicant, stated that

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at 6.30 on the morning of the day in question the applicant, along with other workmen, was told off to repair the roof of some premises in Wright-street. They selected ladders and scaffold ropes for the purpose. A large ladder had been erected, and was being secured by ropes to the palisadings in front of the house, two smaller ladders which were to be used being on Southern's premises ready to be carried across. The ladder was blown down by a heavy gust of wind before it was properly secured, and the applicant was seriously injured.

Several witnesses, including Mr. Emerson, a delegate from the Bricklayers' Society, and Mr. Tighe, a delegate from the Builders' Labourers' Society, gave evidence that a combination of three ladders as described, when erected, was known in the trade as a "roof scaffolding."

Mr. Owen, for the respondent, argued that this combination of ladders, if completely erected, would not form a scaffold within the meaning of the Act, and even if it did, as there was only one ladder actually on the job and erected, it could not alone be a scaffold.

For the applicant Mr. Dawson argued that a scaffolding, according to the decision of the House of Lords in Hoddinott *v.* Newton Chambers, included any arrangement of ladders or poles, and even a pair of steps appropriate for use on the particular repairs being carried out, and that for the purpose of the Act a ladder by itself might be held to be a scaffolding. To send up other ladders and to lash them to the first was a contrivance appropriate for the repair of a roof, and was a scaffolding within the Act. The fact that all parts of the scaffolding were not actually on the premises was immaterial, as it was the intention of all parties to take them there, and the repairs were actually carried out in this way after the accident. The ladder was part of the scaffolding, and as soon as it was brought on the premises the repair of the building had commenced, and the applicant was within the Act.

His Honour, in giving judgment, found that the arrangement of ladders described (and of which evidence had been given that such a contrivance was usually employed for the repair of a roof) was a scaffold within the meaning of the Act. Whilst at the time of the accident the scaffolding was not erected, yet it was in process of erection. It did not matter whether all the materials for constructing the scaffolding were actually on the premises or not. The repair of the building by means of scaffolding within the meaning of the Act had commenced at the time of the accident, and he awarded the applicant half wages from the date of the accident, and costs.—*Eastern Morning News.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

8,592 of 1903.—R. E. ATKINSON: *Steam and Hot-water Heating Systems.*

A steam or hot-water heating system. The return main is provided of the smallest diameter at the point of connexion to the set of radiators or the like nearest the boiler, or other source of heat, and of increasing diameter at the succeeding points of connexion to the other and farther sets, being of largest diameter at the point of connexion to the most remote set of radiators, from which point the return main is continued of such large diameter to the boiler; the slope or fall of the return main being also arranged to be from the point of connexion to the nearest set to the boiler, downwards to the point of connexion to the most remote set.

9,894 of 1903.—W. JOSTEN: *Domestic Stoves and other Fireplaces.*

A domestic stove or fireplace, comprising in its construction a movable grate connected with an adjustable balance-lever or spring, a movable fuel receptacle, divided into compartments, and a locking and releasing mechanism adapted to control the motion of the fuel receptacle, the whole being so arranged and constructed, that when the weight of the fuel on the grate has fallen to a given limit, the grate will rise and act on the releasing mechanism, in consequence of which, the fuel receptacle will advance a given distance, and the fuel contained in one of the compartments will slide down upon the grate.

11,463 of 1903.—R. E. LEETHAM: *Outlets or Exits for Inclined Storage Compartments or Floors.*

This consists in the combination with a gravity delivering storage compartment of a hinged trap, so arranged that it serves to block the passage of a series of packages placed in the compartment until released, and upon its release permits the packages to pass at suitable intervals, the passage of a package being utilised to restore the position of the trap so as to block the next succeeding package until the first package has passed forward, the trap being afterwards released so that the second package may then commence to pass on, and so on as long as required.

11,469 of 1903.—C. W. A. TAYLOR and J. STOREY: *Hoists.*

A hoist, having a lifting cylinder with sliding piston therein, and a standing sheave mounted internally therein on a driving shaft, consisting in the combination therewith of a pipe, located parallel to the lifting cylinder, a running sheave attached to the piston, a length of chain or rope attached to one end to a fixed point, and passed under the running sheave to the standing one in such a manner as to increase the speed of the driving shaft and the travel of the load, while at the other it hangs down in the pipe, and is provided with a balance weight, so arranged as to keep the said chain in engagement with the sheave, and avoid having to coil it upon a drum as hitherto.

13,739 of 1903.—H. E. BADEN: *Lavatory Basins.*

This consists in the combination of a basin, an overflow pipe, a chamber in communication with the basin and pipe, a lever in the chamber, a valve pivoted to the lever, and closing the communication between the basin and the chamber, and a rod passing down the overflow pipe, and pivoted to the lever.

14,395 of 1903.—R. H. HEPBURN: *Metallic Roof and Wall Tiles and Slabs, or Shingles, and the like.*

A tile or shingle, having at an intermediate position between the upper and lower edges a transversely directed hooked or inverted U-sectioned channel or recess, whose mouth or entrance is open to the top or upper side of the tile, whose lower or bottom edge is of a reversed hooked section, so when a series of such tiles are arranged in courses, with their upper edges attached or secured by nailing or otherwise to a roofing or wall, or the like, the said hooked bottom edges of the tiles of each course will take into and interlock with the transverse channels or recesses in the tiles of the course below, so that each individual tile is secured, or held down at its bottom edge as well as at the top edge.

27,424 of 1903.—D. CREE and H. D. DICKEON: *Sectional Bookcases.*

A case for books or other articles, comprising a plurality of independent and interchangeable sections, adapted to be piled one upon another, and connected together, each of said sections consisting of end pieces, a bottom, top, a back affixed to the rear edges of the said end pieces, and a downwardly opening door pivotally affixed to the end pieces of each section at a point below the level of the respective section bottoms, said doors being fashioned with cyma recta edges adapted to rest upon and overlap the cyma recta upper edges of the similar doors belonging to the adjacent underlying section, said doors being adapted to open to a horizontal position, and to serve as shelves.

28,048 of 1903.—J. F. WINTERFLOOD and A. C. H. WINTERFLOOD: *Water Heaters.*

Water heaters and automatic valve attachments, consisting of two conical coils joined together at their larger and smaller ends with an inlet and outlet, a heating device, plate, and casings in combination with two valve chambers so fixed together that the spindle to which are connected the gas and water valves passes through the centre of the two chambers, the opening and closing of the water valve simultaneously opening and closing the gas valve, the water valve consisting of a ring or tube fixed to a rubber diaphragm and encircling a cup.

666 of 1904.—F. KEUSEN: *Adjustable Stove Pipe.*

An adjustable stove pipe, characterised by collars provided on the several parts, and by means of which the parts pushed into each other are guided and made tight, and which also admit of a slight movement.

910 of 1904.—A. T. GOODWIN: *A Greenhouse Building.*

In this improvement in a greenhouse building a cement sill is used, with iron attachments which securely cramps the sill and woodwork together, all the woodwork generally fitting on to the sill, to be cut short, leaving air spaces, brass plates being used to exclude outside air from entering the greenhouse.

5,177 of 1904.—G. MEYERHOLZ: *Device for Cutting Off and Pulling On Antiseptic Covers for the Seats of Water-closets.*

A device for automatically moving strips of antiseptic paper over the seats of water-closets, and cutting off the used ends of the same, comprising in combination two rollers suspended at the front end of the basin, strips of antiseptic paper wound on said rollers, two pairs of clamping rollers rotatably fixed on the lower surfaces of the seat near the edge of the central opening of the same, each pair of rollers serving for the guidance of the ends of the paper strips, curved levers, two at each side inside the basin, crossing each other, horizontal pivots, one for each pair of levers, and vertical pivots, one for each pair of levers, a rod connecting the ends of the inner and outer lever of each pair of curved levers, and a rod connecting the ends of the outer and inner lever of each pair of curved levers, an opening in the rear wall of the basin through which pass the coupled ends of the curved levers, links one for each pair of curved levers, linked to the middle of each connecting rod, a fixed ring through which said links are passed, a handle bar, to the bottom end of which the upper ends of the links are linked, spiral springs between the front ends of each pair of curved links, and spiral springs at the connecting rods of the lever ends.

6,530 of 1904.—W. KULOW: *Water-closets.*

A water-closet bowl or basin, having arranged within itself a separate lower end closed flushing chamber or pocket, having near its lower end an upward and rearward inclined jet-nozzle, a short distance above the latter, an additional correspondingly inclined jet-nozzle, jointly delivering their water jet into the upper part of the trap, said flushing chamber and trap and the outlet member of said trap, all being rectangular and relatively contracted throughout in cross-section.

6,762 of 1904.—W. K. KAYE: *Locks or Latches for Sliding Doors.*

Locks or latches for sliding doors, consisting of a handle in a sliding plate, such plate having a projection therein in combination with a lever and a movable hook bolt, with or without an extension thereon.

11,307 of 1903.—H. QUERTIER: *Machine for Excavating, Raising, Screening, and Filling Gravel Ballast, and the like.*

A machine, consisting in the combination a travelling truck, a circular turn-table thereupon, a bed-plate, friction rollers in the plate running upon the turn-table, a king post, winch drums that are operated through a motor-driven shaft and worm and worm wheel, lines upon the drums, said lines passing through the bed-plate and around the waist of the turn-table reversely to each other in such a way that when one of the drums is revolved, the bucket ladder and the superstructure of the machine will be swung out of line.

13,095 of 1903.—J. G. STIDDER: *A Flexible Damp-proof backing for Glass, Opal, and other Tiles.*

This consists of a mixture of pitch, sulphur, bitumen, oil, and sand, with small particles of glass or other material, prepared by heat, so as to form a flexible damp-proof grip backing applied to opal or other tiles fixed to walls, by which cracking by vibration is prevented.

13,273 of 1903.—H. C. FERRON: *Metallic Roofing plates, and the like.*

The construction and use of a roof or covering composed of locking strips of metal secured to the ordinary supporting parts, and metal plates or "tiles," secured thereto by tongues.

13,566 of 1903.—D. LONGWORTH: *Sluice Gates or Shutters for Waterways.*

This consists in the combination with a sluice gate, shutter, or valve for waterways, of balance plates, one or more of which is or are placed on each side of the sluice vent or outlet, or on each side of the entrance passage thereto, whereby, when the sluice-gate shutter or valve is opened, the flow of water will be straight and unobstructed between the reservoir or head and its outlet sluice, vent, or discharge pipe.

13,689 of 1903.—T. GILMOUR: *Method of, and Means for, Draining and Aërating Agricultural Land, and Soil under Glass.*

A number of holes of any desired shape, and in any desired position, are formed in the drain tiles, but preferably in the upper part and joined edges of each tile. Tiles thus perforated are effective for draining purposes, and when these tiles are used, currents of air may be made to flow through them and through the surrounding earth by means of a pump, fan, blower, or exhauster, driven in any desired manner, but preferably by a windmill, or it might be a water-motor.

13,988 of 1903.—R. THRUL: *Beams or Girders.*

A bow-string girder of concrete and metal, in which the metal insertions in the curved concrete portion carrying the load are connected together by means of metal ties that take the thrust, said ties carrying a thin plate which extends as a chord across the concavity of the said curved portion, so as to constitute a flat

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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underside for the girder, with a sound deadening cavity between itself and the said curved portion.

18,918 of 1903.—G. P. WALLIS: *Brick-making Machinery.*

This relates to the manufacture of bricks of sand and lime, and consists of a compound mixer, constituted of two chambers at right-angles to one another, the chamber into which the sand and lime are first introduced having a revolving helical mixer or helical blades, carried by a spindle, which conveys the mixture to the second chamber inlets in first chamber, situated near the entrance for the sand and lime, for the admission of CO_2, or steam, or both, a dome or hollow space in said first chamber, in which said steam and CO_2 may admix before entering the mixture in said first chamber, two parallel horizontal spindles through centre of the second portion of mixer, rotating at differential speeds, knives, or blades, attached to said horizontal spindles, and a chute at the end of said second portion of mixer.

23,727 of 1903.—S. H. CLARKE: *An Arch Brick.*

An arch brick, consisting of two main parts partially superposed one upon the other, and united throughout the corresponding portion of the length of each, the said parts extending lengthwise beyond one another in opposite directions, the longitudinal jointing faces being disposed in places radially to the axis of the arch, whereof the brick forms an element, and the side faces of the brick being curved to radii, respectively corresponding to the radius of the said arch.

23,759 of 1903.—I. BRADLEY: *Heating Buildings.*

A heating system of the kind, in which heated water vapour is employed and passed through a system of pipes, or pipes and radiators, open to the atmosphere, consisting in the employment of a device for controlling the supply of vapour in accordance with the consumption.

6,372 of 1904.—THE FIREPROOF PLATE WALL COMPANY, LTD., and C. H. SIDEBOTHAM: *Building Plates or Slabs for Walls, or other Structures.*

This invention relates to plates made of plaster cement, or similar material for making or building partition walls, and for other structures, and is designed to provide plates which can be expediously erected, and with strong joints. It consists essentially in constructing a plate grooved on all four edges, with sinuous edges, and with feet or projections upon the bottom to hold the sinuous top and bottom joints apart for the insertion of plaster between them.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 3.—By DEBENHAM, TEWSON & CO.

Hoxton.—New North-rd., etc., f.g.r. 40*l.*, reversion in 4½ yrs. £3,000
Nicholas-st., f.g. rents 61*l.*, reversion in 4½ yrs. 12,105
St. John's-rd., etc., f.g. rents 32*l.*, reversion in 4½ yrs. 2,775
Nicholas-st., four peppercorn f.g. rents, reversion in 4½ yrs. 8,425
Nicholas-st., f.g. rents 17*l.*, reversion in 4½ yrs. 5,700
Nile-st., etc., f.g. rents 36*l.* 19s. 10d., reversion in 4 yrs. 3,500
Allerton-st., etc., f.g. rents 63*l.*, reversion in 4 yrs. 7,275
Allerton-st., etc., five peppercorn f.g. rents, reversion in 4 yrs. 10,150
Allerton-st., f.g. rents 33*l.*, reversion in 4 yrs. 3,350

By CHAMPION & BUSBY.

Chelsea.—42, Elm Park-rd., u.t. 70 yrs., g.r. 15*l.*, y.r. 100*l.* 1,000
60, Elm Park-rd., u.t. 70 yrs., g.r. 12*l.* 10s., y.r. 110*l.* 995

By FRANK JOLLY & CO.

Maida Vale.—24, Blomfield-rd., u.t. 34½ yrs., g.r. 12*l.*, y.r. 65*l.* 480

By PRICKETT & ELLIS.

Highgate.—59, High-st. (s.), c., y.r. 30*l.* 530

By ALFRED RICHARDS.

Stamford Hill.—St. Ann's-rd., Tee-to-Tum Athletic Grounds, area 4½ acres, f., p. 6,600
111, High-rd. (s.), with land in rear, u.t. 73½ yrs., g.r. 20*l.*, y.r. 40*l.* 200
Tottenham.—127 and 129, Northumberland-pk., f., y.r. 80*l.* 1,150
Northumberland-pk., f.g.r. 10*l.*, reversion in 66 yrs. 240
97, Northumberland-pk., f., y.r. 40*l.* 510
1, 2, and 3, Trulock-rd., u.t. 63 yrs., g.r. 10*l.*, e.r. 78*l.* 745
603, High-rd. (s.), u.t. 63 yrs., g.r. 8*l.*, y.r. 45*l.* 500
36 and 38, Lansdowne-rd., f., y.r. 87*l.* 1,240

By J. W. FLORANCE (at Birmingham).

Sheldon, Warwick.—"Wells Farm," also "The Poplars," and 'Cherry Tree Cottage," total area 110 acres, f. 9,000

By WHITFIELD & SONS (at Oswestry).

West Felton, Salop.—"The Hollies" and 124 a. 1 r. 15 p., f. 5,050
"Lady Hill Farm," area 99 a. 0 r. 9 p., f. 3,500

May 4.—ABERCROMBIE & EDMUNDS.

Plaistow.—Plaistow-rd., "The Railway Tavern," u.t. 64 yrs., g.r. 30*l.*, y.r. 100*l.* £2,000
Kentish Town.—40, Dartmouth Pk.-rd., u.t. 58 yrs., g.r. 8*l.*, y.r. 50*l.* 380
Hampstead-road.—Harrington-st., i.g. rents 71*l.*, u.t. 20 yrs. g.r. 15*l.* 580

By W. & F. EVES.

Fulham.—58, Bishop's-rd., u.t. 72½ yrs.. g.r. 7*l.* 10s., y.r. 46*l.* 16s. 320
93, Bishop's-rd. (s.), u.t. 74 yrs., g.r. 9*l.*, w.r. 57*l.* 4s. 450

By PERCY GOODSHIP & CO.

Wood Green.—Dagmar-rd., six plots of building land, f. 650
New Southgate.—Bowes-rd., "The Oaks," u.t. 97 yrs., g.r. 7*l.*, e.r. 32*l.* 310

By J. & R. KEMP & CO.

Deptford.—68 to 72 (even), Deptford-green, f., w.r. 75*l.* 8s. 760

By E. J. LANE.

Bow.—44, Wellington-rd., f., w.r. 28*l.* 12s. 320
Bromley-by-Bow. — 15, Edgar-rd., f., w.r. 32*l.* 10s. 355
31 to 37 (odd), Three Mill-la., f., w.r. 110*l.* 4s. 1,330
Tottenham.—31, Lealand-rd., u.t. 74 yrs., g.r. 6*l.*, w.r. 41*l.* 12s. 265

By T. D. PEACEY.

Camden Town.—36 and 37, Park-st. (s.), u.t. 13 yrs., g.r. 8*l.*, y.r. 100*l.* 450
Kentish Town.—59, Highgate-rd., u.t. 69 yrs., g.r. 12*l.*, w.r. 79*l.* 6s. 425
81, Willes-rd. u.t. 48 yrs., g.r. 5*l.*, w.r. 58*l.* 10s. 325

By C. P. WHITELEY.

Southampton.—Winchester-rd., "The Shirley Brewery," also Mineral Water Factory, area ¾ of an acre, f. 2,475
Streatham.—50, Ellison-rd., u.t. 75 yrs., g.r. 2*l.*, y.r. 65*l.* 850

May 5.—By H. J. BLISS & SONS.

Dalston.—Pownall-rd., i.g. rents 29*l.*, u.t. 41½ yrs., g.r. nil, with reversion 500
Regent's-row, i.g. rents 18*l.*, u.t. 41½ yrs., g.r. nil, with reversion 320
Norwich-rd., i.g. rents 11*l.* 5s., u.t. 41½ yrs., g.r. nil, with reversion 190
Greenwood-rd., i.g. rents 8*l.*, u.t. 47 yrs., g.r. nil 145
31, Navarino-rd., u.t. 49 yrs., g.r. 7*l.*, y.r. 48*l.* 410
Clapton.—76 and 78, Rushmore-rd., f., y.r. 58*l.* 910
Rushmore-rd., f.g.r. 5*l.*, reversion in 66 yrs. 130
65, Rushmore-rd., u.t. 72½ yrs., g.r. 5*l.* 5s., y.r. 30*l.* 340
42, Mayola-rd., u.t. 66½ yrs., g.r. 5*l.*, y.r. 32*l.* 330
Stoke Newington.—109, Evering-rd., u.t. 71½ yrs., g.r. 9*l.*, y.r. 50*l.* 400

By CHESTERTON & SONS.

South Kensington.—8, 9, 10, and 11, Walgrave-rd., u.t. 54 yrs., g.r. 10*l.* 12s., y.r. 132*l.* 1,375
1 to 10, Logan-mews, u.t. 64 yrs., g.r. 10*l.*, y.r. 415*l.* 4,100
Logan-mews, garden ground and store-house, area 11,000 ft., u.t. 64 yrs., g.r. nil, y.r. 32*l.* 1,500
Kensington.—5, Bedford-gdns., u.t. 19 yrs., g.r. 10*l.*, e.r. 75*l.* 300

By FIELD & SONS.

Southwark.—60, 62, and 64, Sumner-st. (factory, s., etc.), area 2,600 ft., f., e.r. 215*l.* 3,000
Walworth.—16, Beckway-st. (s.), f., y.r. 40*l.* 440

By G. HEAD & CO.

St. John's Wood.—5, Ordnance-rd., u.t. 30½ yrs., g.r. 5*l.*, y.r. 55*l.* 350

By NEWBON, EDWARDS, & SHEPHARD.

Hackney.—Lauriston-rd., "The Empress of India," p.-h., etc., f.g.r. 100*l.*, reversion in 75 yrs. 2,600
Dunloe-st., f.g.r., 8*l.* 8s., reversion in 22½ yrs. 450
Clapton.—59, Median-rd., f., y.r. 34*l.* 505
17 and 19, Elderfield-rd., f., y.r. 60*l.* 925
60, Elderfield-rd., f., y.r. 32*l.* 440
Hackney.—39, Gore-rd., u.t. 50 yrs., g.r. 2*l.*, y.r. 40*l.* 465
2, Victoria-gr., u.t. 23½ yrs., g.r. 3*l.* 3s., w.r. 22*l.* 2s. 135

By STIMSON & SONS.

Blackfriars.—79, Blackfriars-rd., f., y.r. 90*l.*. 1,240
Old Kent-rd.—71, Tower Bridge-rd. (s.), and 1 and 1A, Rothsay-st., f., y.r. 150*l.* 2,575
Clapham.—11, The Polygon (s.), f., e.r. 50*l.* 510
Dulwich.—1 to 4, Belmont-villas, u.t. 81 yrs., g.r. 25*l.* 4s., y.r. 136*l.* 1,085
Stepney.—51, Stepney-green (with stabling and yard), u.t. 51 yrs., g.r. 15*l.*, e.r. 75*l.*. 740
Hendon.—Bell-la., two copyhold cottages, w.r. 35*l.* 2s. 170
Walworth.—24 and 26, Lorrimore-st., u.t. 40 yrs., g.r. 10*l.*, y.r. 62*l.* 575
Brockley.—47, 49, 51, 65, and 67, Adelaide-rd., u.t. 61½ yrs., g.r. 30*l.* 1s. 6d., y.r. 196*l.* 1,775
South Lambeth.—189, Fentiman-rd., u.t. 66½ yrs., g.r. 12*l.* 5s., e.r. 50*l.* 500
Clapham.—93, Marney-rd., u.t. 84½ yrs., g.r. 7*l.*, y.r. 36*l.* 560
Finchley.—Vineyard-ter. (rear of), a plot of land, f. 100
Stoke Newington.—15, Hawksley-rd., u.t. 69½ yrs., g.r. 6*l.*, e.r. 28*l.* 250
12, Goldsmith-sq., u.t. 47½ yrs., g.r. 4*l.*, y.r. 28*l.* 240

By JOSEPH STOWER.

Gray's Inn-rd.—5 to 16, Robert-st., f., y.r. 410*l.* 8,150
19 to 29, Robert-st., f., y.r. 340*l.* 6,630
14, Little James-st., f., y.r. 32*l.* 710
Little James-st., "The White Lion" p.h., f., y.r. 100*l.* 3,550
Battersea.—30, 31, and 34, Gladstone-ter., u.t. 58½ yrs., g.r. 13*l.* 10s., w.r. 107*l.* 655

By WORSFOLD & HAYWARD (at Dover).

Dover.—1, 2, and 3, Caroline-pl., f., w.r. 43*l.* 6s. 8d. £445
6 and 7, Union-row, f., w.r. 29*l.* 9s. 4d. 290
7 and 8, Bowling Green-hill, f., w.r. 22*l.* 2s. 305
13, 14, and 18, Albion-pl., f., w.r. 35*l.* 10s. 8d. 190
47, Buckland-av., f., p. 145
59, Clarendon-st., f., w.r. 18*l.* 4s. 240
81, High-st., f., p. 340
16, De Burgh-st., f., y.r. 16*l.* 250

By CRONKS' (at Sevenoaks).

Sundridge, Kent. — "Scollops Farm," 88 a. 3 r. 27 p., f., p. 3,050
Sevenoaks, Kent.—Clarendon-rd., freehold building land, with stone quarry, 3 a. 2 r. 0 p. 700
65, London-rd. (business premises and warehouse), also stabling and cottage adjoining, f., p. (with goodwill) 4,570

By BOYTON, SONS, & BUCKMASTER (at Fulham).

Fulham.—44, Britannia-rd., u.t. 52 yrs., g.r. 5*l.*, p. 400
Battersea.—1, Ashness-rd. (s.), u.t. 77½ yrs., g.r. 6*l.*, y.r. 42*l.* 515

May 6.—WM. CLARKSON.

Walthamstow.—10, Coppermill-la., f., w.r. 33*l.* 16s. 265
Forest-rd., four plots of freehold land 370

By DRIVERS'.

Holloway.—1A, 2A, 2, and 4, Victoria-rd., f., y.r. 148*l.* 2,000

By ELLIS & SON.

City of London.—109, Fenchurch-st. (shops and offices), area 2,800 ft., u.t. 65 yrs., g.r. 900*l.*, e.r. 1,910*l.* 4,800
Chadwell Heath, Essex. — Whalebone-la., "Paulatine Lodge" and 18½ acres, f., p. 4,600

By LINNETT & LANE.

Harlesden.—57 and 59, Craven Park-rd., u.t. 68 yrs., g.r. 9*l.* 4s., y.r. 85*l.* 850
25, Fortune Gate-rd., u.t. 85 yrs., g.r. 6*l.*, e.r. 34*l.* 290

By NOTT, CARTWRIGHT, & ETCHES.

Pimlico.—187, Vauxhall Bridge-rd., u.t. 20 yrs., g.r. 5*l.* 10*l.*, y.r. 46*l.* 300
Balham.—6, 8, 10, 12, 20, 22, and 24, Harberson-rd., u.t. 81 yrs., g.r. 42*l.* 12s., w.r. 249*l.* 12s. 1,930
150 and 152, Ramsden-rd., f., y.r. 80*l.* 1,100
15, 16, and 17, Holly-gr., f., w.r. 75*l.* 8s. 690

By G. A. WILKINSON & SON.

Balham.—87, Fernlea-rd., u.t. 69½ yrs., g.r. 6*l.* 6s., y.r. 32*l.* 250

May 5.—By J. HARRIS & SON (at Stockbridge).

Stockbridge, Hants.—"Upper Sandy Down Farm," 201 a. 1 r. 16 p., f. 1,650
London-rd., freehold land with stabling and granary, area 0 a. 2 r. 23 p. 155
White-st., four freehold cottages, w.r. 41*l.* 12s. 750
High-st., "Hero Cottage," f., y.r. 14*l.* 225

By SMALLPEICE, ALLEN, & CO. (at Croydon).

Croydon.—17, 18, and 19, Dingwall-rd., f., y.r. 113*l.* 1,375

By R. C. S. EVENETT (at Haslemere).

Haslemere, Surrey.—"Church Hill Cottage," and 0 a. 1 r. 17 p., f., y.r. 40*l.* 750
"Grove Cottage" and "Bankside Cottage," and 0 a. 1 r. 18 p., f., y.r. 13*l.* 13s. 1,000
Shepherd's Hill, three cottages, part f. and part long leasehold, g.r. nil, y.r. 32*l.* 18s. 450
Shepherd's Hill, freehold building site 140
Clay Hill, freehold brick yard, cottage, and 1 a. 3 r. 2 p., y.r. 11*l.* 1,100
Clay Hill, two freehold cottages 510
Clay Hill, enclosure of land, 0 a. 2 r. 30 p., f. 275
Bunch-la., a freehold meadow, 3½ acres 850

May 9.—By FRASER & HEIGH.

Kentish Town.—39, Lady Margaret-rd., u.t. 61 yrs., g.r. 4*l.*, p. 550
Regent's Park.—15, Chalcot-cres., f., y.r. 48*l.* 640
Kentish Town.—1, 2, and 3, Wesleyan-pl., f., y.r. 92*l.* 1,295
29, Gospel Oak-gr., f., y.r. 28*l.* 365
44 and 48, Woodsome-rd., u.t. 58 yrs., g.r. 13*l.* 10s., y.r. 84*l.* 915
Regent's Park.—6, Oppidans-rd., u.t. 60 yrs., g.r. 12*l.*, y.r. 50*l.* 700

By H. HOLMES & CO.

Marylebone.—31, 34, and 37, Fitzroy-st., f., y.r. 205*l.* 4,300
Tottenham Court-road.—12, London-st. (s.), f., y.r., 65*l.* 1,250
94 and 96, Whitfield-st., f., y.r. 100*l.* 2,200

By NICHOLAS, DENYER, & CO.

Northwood, Middlesex.—"Green End" and 1 a. 0 r. 18 p., f., p. 2,000
Turner's Hill, Sussex.—"Mount Pleasant" and 14 acres, f., p. 1,900

By MORRIS, MARSHALL, & POOLE (at Welshpool).

Llanfair Caereinion, etc., Montgomeryshire.—"The Heniarth Estate" and Water Corn Mill, 119 a. 1 r. 36 p., f. 3,365

May 10.—DEBENHAM, TEWSON, & CO.

West Worthing, Sussex. — Marine Parade, "The Hotel Metropole" (unfinished), area 2½ acres, f., p. 10,300
Hendon.—The Hyde, "The Rookery" and 12 a. 0 r. 30 p., f., y.r. 125*l.* 5,658
Totteridge-la., four enclosures of land, 39 a. 0 r. 25 p., f., p. 3,325
Mill Hill.—Main-rd., four cottages, farmhouse, and buildings, area 2 a. 0 r. 36 p., f., y.r. 66*l.* 8s. 1,725

By A. ALDRIDGE & CO.

Barbican.—Lensden-pl., f.g.r. 130*l.*, reversion in 71 and 66 yrs. 3,120
Wood Green.—Palace Gates-rd., f.g.r. 39*l.*, reversion in 90½ yrs. 897
Wembley, Middlesex.—Copland-rd., f.g.r. 36*l.*, reversion in 92 yrs. 828

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By BREADMORE & WEBB.
Weybridge, Surrey.—Prince s-rd., "Lancaster Cottage," f., y.r. 6*l.* £900

By DAVID BURNETT & Co.
Old Kent-road.—Hatcham-rd., f.g.r. 17*l.* 8s., reversion in 42½ yrs. 450
Penarth-st., f.g.r. 16*l.*, reversion in 46 yrs. .. 365
Sydenham.—Bradford-rd., f.g.r. 51*l.*, reversion in 60 yrs. 1,260
Folkestone, Kent.—Canterbury-rd., etc., f.g.r. 15*l.*, reversion in 72 yrs. 430
Marylebone.—6, Grove-mews, u.t. 68½ yrs., g.r. 7*l.*, y.r. 52*l.* 400
East Barnet.—Fergusson-rd., f.g.r. 37*l.* 10s., reversion in 94 yrs. 810
East Barnet-ter., f.g.r. 30*l.*, reversion in 95½ yrs. 685

By NIGHTINGALE, PHILLIPS, & PAGE.
Putney.—Upper Richmond-rd., f.g. rents 24*l.*, reversion in 64 yrs. 635

By G. F. NORFOLK & Co.
Blackheath.—22, Banchory-rd., u.t. 81 yrs., g.r. 5*l.* 10s., w.r. 35*l.* 2s. 285

By ROGERS, CHAPMAN, & THOMAS.
Pimlico.—41 and 45, Denbigh-st., u.t. 26 yrs., g.r. 16*l.*, y.r. 122*l.* 1,010
87, Lupus-st., u.t. 24 yrs., g.r. 10*l.*, y.r. 80*l.* 700

By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).
Shepherd's Bush.—218, Uxbridge-rd. (with off-licence), u.t. 7½ yrs., y.r. 60*l.* 400
Stoke Newington.—12, Stoke Newington-rd. (with off-licence), u.t. 22 yrs., y.r. 100*l.* .. 950
Dalston.—5, Junction-pl. (with off-licence), u.t. 20 yrs., y.r. 120*l.* 250
Holloway.—128, Hornsey-rd. (with off-licence), u.t. 15 yrs., y.r., etc., 105*l.* 360

By J. H. NORTH & Co. (at Dublin).
Foxford, co. Mayo.—"The Massbrook Estate," 356 acres (with shooting rights over 3,167 acres) 7,500

May 11.—By H. J. BROMLEY.
Norwood.—431 and 433, Norwood-rd. (s.), u.t. 53 yrs., g.r. 25*l.*, y.r. 210*l.* 2,600

By H. DONALDSON & SON.
Blackfriars.—Gray-st., the "John o' Groats" p.h., etc., f.g. rents 52*l.* 10s., reversion in 31 yrs. 1,800
Mile-end.—2 to 16 (even), Louisa-gdns., u.t. 64 yrs., g.r. 49*l.* 13s., w.r. 313*l.* 6s. 2,490

By EASTMAN BROS.
Sydenham.—9, Venner-rd., f., e.r. 40*l.* 300

By PROTHEROE & MORRIS.
Rayleigh, Essex.—Eastwood-rd., "The Bungalow," f., y.r. 25*l.* 400

By A. H. TURNER & Co.
Weybridge, Surrey.—Windsor Walk, "Greta Bank," f., p. 1,500

By DOUGLAS YOUNG & Co.
Chelsea.—59 to 65 (odd), Park-walk; 25 to 37 (odd), Little Camera-st., 1 to 15, Camera-cottages (with manufacturing premises), u.t. 10½ yrs., g.r. 23*l.* 19s., y.r. 66*l.* 18s. .. 1,700
1 to 19, Camera-sq. and land adjoining, u.t. 10½ yrs., g.r. 35*l.* 10s., y.r. 572*l.* 2s. 2,400
Streatham.—25, Stanthorpe-rd., u.t. 77 yrs., g.r. 15*l.* 6s., y.r. 55*l.* 400
Hampton Wick, Middx.—Cedars-rd., "Esk House," u.t. 93 yrs., g.r. 10*l.*, e.r. 50*l.* 350
Catford.—151, Braidwood-rd., u.t. 991 yrs., g.r. 3*l.* 16s., y.r. 26*l.* 190

By ALFRED RICHARDS.
Tottenham.—116 to 134 (even), West Green-rd., f., y.r. 339*l.* 7,100
136, West Green-rd., f., y.r. 54*l.* 840
138 to 152 (even), West Green-rd., f., y.r. 332*l.* 4,410
1 to 31 (odd), Bedford-rd., f., y.r. 586*l.* 7,995
2 to 30 (even), Bedford-rd., f., y.r. 538*l.* 7,300
Lawrence-rd., two pieces of freehold building land 1,600

By W. BROWN & Co. (at Chesham).
Chartridge, Bucks.—"Lime Tree Farm," 100 a. 1 r. 5 p., f. 3,300

By CHESSHIRE, GIBSON, & Co. (at Dolgelly).
Llanelltyd, Merioneth.—Cesailgwm Bach Farm, 265 a. 3 r. 10 p., f. 1,660
Llanaber, Merioneth.—Cwm-Mynach-Canol Farm, 233 a. 1 r. 35 p., f. 551
Llanddwywe-Uwch-y-Graig, Merioneth.—Derlwyn Glanllwyd Farm, 252 a. 1 r. 38 p., f. 280

By EDWIN EVANS (on the Estate).
Norbury.—Melrose-ave., etc. (Norbury Park Estate), 112 plots of freehold building land (in lots) 11,340

May 12.—By CRONKS'.
Sevenoaks, Kent.—7 and 8, Camden-villas, f., y.r. 82*l.* 10s. 890
2, Granville-rd., f., y.r. 50*l.* 500

By DAVIS & Co.
Peckham.—4 to 14, 26, 32 to 46 (even), Marmont-rd., u.t. 52½ yrs., g.r. 80*l.*, w.r. 665*l.* 12s. 3,640

By NEWBON, EDWARDS, & SHEPHARD.
Holloway.—481, Holloway-rd., f., y.r. 85*l.* 1,160
20, Manor-gdns., u.t. 62 yrs., g.r. 8*l.*, y.r. 48*l.* 425
52 and 54, Rupert-rd., u.t. 59½ yrs., g.r. 14*l.* 14s., w.r. 109*l.* 4s. 320
43 and 45, Cromwell-rd., u.t. 59 yrs., g.r. 14*l.* 14s., w.r. 111*l.* 16s. 330
67 and 69, Hampden-rd., u.t. 62 yrs., g.r. 12*l.*, w.r. 104*l.* 325
57 and 59, Langdon-rd., u.t. 72½ yrs., g.r. 10*l.*, w.r. 83*l.* 4s. 595
56 and 58, Rupert-rd., u.t. 53 yrs., g.r. 15*l.*, w.r. 80*l.* 12s. 475
67 and 69, Yerbury-rd., u.t. 63 yrs., g.r. 12*l.*, y.r. 72*l.* 630
82 and 84, Campbell-rd., u.t. 63½ yrs., g.r. 10*l.*, w.r. 65*l.* 380
Hornsey Rise.—15, Mulkern-rd., u.t. 74½ yrs., g.r. 5*l.*, w.r. 20*l.* 18s. 190
Kentish Town.—58, 60, and 62, Peckwater-st., u.t. 45 yrs., g.r. 15*l.*, w.r. 117*l.* 645
Canonbury.—33, Halton-rd., u.t. 14¼ yrs., g.r. 4*l.* 4s., q.r. 34*l.* 120

By FAREBROTHER, ELLIS, & Co.
West Kensington.—10, 12, 14, 19, 21, and 23, Auriol-rd., u.t. 65 yrs., g.r. 24*l.*, y.r. 335*l.* £3,030
Fleet-street.—3, Crane-ct., area 750 ft., building lease for 80 yrs., let at per annum 100

By C. C. & T. MOORE.
Commercial-rd. East.—No. 152, also 2 and 4, Morgan-st. (s.), f., p. 1,700
Leytonstone.—53, 55, and 57, Queen's-rd., f., y.r. 100*l.* 1,405
Bow.—146 and 148, Tredegar-rd., u.t. 44 yrs., g.r. 15*l.*, w.r. 67*l.* 12s. 500
Canonbury.—68, Grosvenor-rd., u.t. 45 yrs., g.r. 8*l.* 8s., e.r. 52*l.* 400

By DEASON & PENNY and EDWIN EVANS.
Kensal Green.—1 to 11, Rigely-rd., u.t. 75 yrs., g.r. 28*l.* 10s., w.r. 218*l.* 8s. 1,350
Harlesden.—67, Drayton-rd., u.t. 97 yrs., g.r. 7*l.*, w.r. 54*l.* 12s. 330

By EDWIN EVANS.
Ealing.—Lavington-rd., etc., f.g.r. 101*l.* 4s., reversion in 97 yrs. 2,570
Fulham.—Gastien-rd., f.g.r. 30*l.*, reversion in 88½ yrs. 700
Streatham.—66, Lewin-rd., f., e.r. 60*l.* 905
Battersea.—58, Battersea-rise (s., off-license), u.t. 76 yrs., g.r. 12*l.*, y.r. 60*l.* 730
Wandsworth.—93, St. Ann's-hill (s.), u.t. 96½ yrs., g.r. 6*l.* 10s., y.r. 36*l.* 500
21 and 23, Barmouth-rd. (s.), u.t. 98½ yrs., g.r. 14*l.* 14s., y.r. 80*l.* 845

By STIMSON & SONS.
Bermondsey.—20 to 36 (even), Cranham-rd., u.t. 51 yrs., g.r. 24*l.* 15s., w.r. 315*l.* 18s. .. 2,350
Dalston.—20, St. Philip's-rd., u.t. 46½ yrs., g.r. 6*l.*, e.r. 45*l.* 380
Old Kent-road.—8 and 9, Avondale-sq., u.t. 50½ yrs., g.r. 12*l.* 12s., y.r. 68*l.* 700
102, Ormside-st. (s.), u.t. 64½ yrs., g.r. 4*l.*, w.r. 26*l.* 160
New Kent-rd.—67, 69, and 79, Falmouth-rd., u.t. 11½ yrs., g.r. 66*l.*, w.r. 130*l.* 125
Walworth.—27 and 29, Phelp-st., and 1, 3, 5, and 7, Doctor-st., u.t. 4 yrs., g.r. 19*l.*, w.r. 183*l.* 6s. 1,320
Brixton.—31 and 39, Thornbury-rd., u.t. 77¼ yrs., g.r. 12*l.* 10s., y.r. 68*l.* 495
5, Gateley-rd., u.t. 72 yrs., g.r. 9*l.*, y.r. 45*l.* 295
Norwood.—62, Gipsy-hill, u.t. 59 yrs., g.r. 14*l.* 5s., e.r. 60*l.* 250
Wandsworth.—5, Heathfield, f., e.r. 45*l.* 555

May 13.—By BUCKLAND & SONS.
Piccadilly.—38, Half Moon-st., beneficial lease for 15 yrs., y.r. 180*l.* 850

By NORRIS, SON, & HADLEY.
St. John's Wood.—9, Clifton-hill, u.t. 33 yrs., g.r. 12*l.*, e.r. 60*l.* 120

By PRICE, ARROW, & TAYLOR.
Brixton.—13 to 18, Seneca-rd., u.t. 76 yrs., g.r. 30*l.*, w.r. 211*l.* 18s. 230

By W. B. HALLETT.
Highbury.—117, Highbury New-pk., u.t. 45 yrs., g.r. 8*l.* 10s., e.r. 80*l.* 310
Anerley.—2, Station-rd. (s.), u.t. 70 yrs., g.r. 17*l.*, e.r. 80*l.* 105
Lambeth.—22, Lambeth-walk, u.t. 81 yrs., g.r. 20*l.*, w.r. 62*l.* 10s. 505

By REYNOLDS & EASON.
Lewisham.—Loampit-hill, "Beaufort Lodge," u.t. 51½ yrs., g.r. 1*l.* 10s., y.r. 55*l.* 110
Dalston.—4 to 14 (even), Shrubland-rd., u.t. 15 yrs., g.r. 24*l.*, y.r. 184*l.* 415
83, Forest-rd., u.t. 8½ yrs., g.r. 4*l.*, y.r. 30*l.* ..
Haggerston.—Fellows-st., l.g.r. 35*l.*, u.t. 9½ yrs., g.r. nil 2,435
Commercial-road East.—Nos. 595 and 597, also 1A and 2A, Belgrave-st., u.t. 4½ yrs., g.r. 20*l.*, y.r. 145*l.* 365
Commercial-road East.—No. 593, u.t. 4½ yrs., g.r. 20*l.*, y.r. 70*l.* 1,600
Stepney.—85, 89, 91, and 93, Dempsey-st., u.t. 9½ yrs., g.r. 12*l.*, y.r. 126*l.* 2,435
95, Exmouth-st., u.t. 9½ yrs., g.r. 3*l.*, y.r. 31*l.* 9 to 13, East Arbour-st., u.t. 7½ yrs., g.r. 12*l.* 10s., y.r. 138*l.* 365
Limehouse.—1 to 27 (odd), Aston-st., and 13, Matlock-st., u.t. 22 yrs., g.r. 22*l.* 12s., y.r. 369*l.* 1,600
Aston-st., l.g.r. 42*l.* 5s., u.t. 22 yrs., g.r. 10*l.* 2,435
West Ham.—2 to 12 (even), Church-st., and 145 to 151 (odd), West Ham-la., u.t. 21 yrs., g.r. 80*l.*, y.r. 325*l.* 3s. 365

By H. E. TRAFFORD & CARTER.
Spitalfields.—25, 27, 28, 29, and 31, Tenter-st., f., w.r. 228*l.* 16s. 1,600
Forest Gate.—55 to 61 (odd), Latimer-rd., f., y.r. 110*l.* 3,600

By THE AUCTION Co.
Holloway.—15, Langdon-rd., f., y.r. 40*l.* 1,400

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court. 575

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MEETINGS.

FRIDAY, MAY 20.
Royal Institution.—Professor E. Rutherford, M.A., on "The Radiation and Emanation of Radium." 9 p.m.
Junior Institution of Engineers (Westminster Palace Hotel).—Paper entitled "Practical Notes on the Running of Motor Cars and Cycles," by Lieut. W. G. Windham, R.N. 8 p.m.
Incorporated Association of Municipal and County Engineers.—Midland District Meeting, Buxton.

SATURDAY, MAY 21.
Edinburgh Architectural Association.—Visit to Fordell Castle and Old Garden.
Incorporated Association of Municipal and County Engineers.—Midland District Meeting. Concluded.

TUESDAY, MAY 24.
Royal Institution.—Mr. H. F. Newall, M.A., F.R.S., on "The Solar Corona," I. 5 p.m.

THURSDAY, MAY 26.
Institution of Electrical Engineers (at The Society of Arts).—Mr. Alexander Siemens, Past President, on "High Speed Electric Railway Experiments on the Marienfeld-Zossen Line." 8 p.m.

FRIDAY, MAY 27. " " "
Royal Institution.—His Serene Highness Albert Prince of Monaco on "The Progress of Oceanography." 9 p.m.

SATURDAY, MAY 28.
Royal Institution.—Sir W. Martin Conway, M.A., on "Spitsbergen in the XVIIth Century," I. 3 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks.	1 16 0	per 1000	alongside, in river.
Rough Stocks and Grizzles	1 13 0	"	" "
Facing Stocks ...	2 12 0	"	" "
Shippers	2 10 0	"	" "
Flettons	1 10 0	"	" "
Red Wire Cuts ...	1 13 0	"	at railway depôt.
Best Fareham Red	3 12 0	"	" "
Best Red Pressed Ruabon Facing	5 0 0	"	" "
Best Blue Pressed Staffordshire ...	4 4 0	"	" "
Do. Bullnose	4 10 0	"	" "
Best Stourbridge Fire Bricks.....	4 8 0	"	" "
GLAZED BRICKS.			
Best White and Ivory Glazed Stretchers	13 0 0	"	" "
Headers	12 0 0	"	" "
Quoins, Bullnose, and Flats.....	17 0 0	"	" "
Double Stretchers	19 0 0	"	" "
Double Headers...	16 0 0	"	" "
One Side and two Ends	19 0 0	"	" "
Two Sides and one End	20 0 0	"	" "
Splays, Chamferred, Squints.	20 0 0	"	" "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	"	" "
Quoins, Bullnose, and Flats.....	14 0 0	"	" "
Double Stretchers	15 0 0	"	" "
Double Headers...	14 0 0	"	" "
One Side and two Ends	15 0 0	"	" "
Two Sides and one End	15 0 0	"	" "
Splays, Chamferred, Squints	14 0 0	"	" "
Second Quality, White and Dipped Salt Glazed	2 0 0	"	less than best.

	s. d.		
Thames and Pit Sand.....	7 3	per yard,	delivered.
Thames Ballast.....	6 0	"	"
Best Portland Cement	30 0	per ton,	"
Best Ground Blue Lias Lime	21 0	"	"

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.	
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	"	"
PORTLAND STONE (20 ft. average)—			
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 1	"	"
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 2½	"	"

	s. d.		
Ancester in blocks	1 11	per ft. cube,	deld. rly. depôt.
Beer "	1 6	"	"
Greenshill "	1 10	"	"
Darley Dale in blocks...	2 4	"	"
Red Corsehill "	2 5	"	"
CloseburnRedFreestone	2 0	"	"
Red Mansfield "	2 4	"	"

YORK STONE—*Robin Hood Quality*

	s. d.		
Scappled random blocks	2 10	per ft. cube.	
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super.	
6 in. rubbed two sides ditto, ditto	2 6	"	"

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STONE.—(*continued*).

	s. d.	
3 in. sawn two sides slabs (random sizes)	0 11½	per ft. sup. deld. rly. depot.
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	,, ,,
1½ in. to 2 in. ditto, ditto	0 6	,, ,,
HARD YORK—		
Scappled random blocks	3 0	per ft. cube, ,,
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. ,,
6 in. rubbed two sides Ditto	3 0	,, ,,
3 in. sawn two sides (slabs random sizes)	1 2	,, ,,
2 in. self-faced random flags	0 5	,, ,,

Hopton Wood (Hard Bed) in blocks 2 3 per ft. cube.
,, ,, ,, 6 in. sawn both sides landings 2 7 per ft. super. deld. rly. depôt
,, ,, ,, 3 in. do. 1 2½ ,, ,,

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 ,, ,,	13 17 6	,, ,,
20 × 10 first quality ,,	13 0 0	,, ,,
20 × 12 ,, ,, ,,	13 15 0	,, ,,
16 × 8 ,, ,, ,,	7 5 0	,, ,,
20 × 10 best blue Portmadoc	12 12 6	,, ,,
16 × 8 best blue Portmadoc	6 12 6	,, ,,
20 × 10 best Eureka unfading green	15 17 6	,, ,,
20 × 12 ,, ,,	18 7 6	,, ,,
18 × 10 ,, ,,	13 5 0	,, ,,
16 × 8 ,, ,,	10 5 0	,, ,,
20 × 10 permanent green	11 12 6	,, ,,
18 × 10 ,, ,,	9 12 6	,, ,,
16 × 8 ,, ,,	6 12 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. ,, ,,
Best Brosely tiles	50 0	per 1000 ,, ,,
Do. Ornamental tiles	52 6	,, ,, ,,
Hip and Valley tiles	4 0	per doz. ,, ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 ,, ,,
Do. Ornamental do	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 0	,, ,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 ,, ,,
Do. Ornamental do	54 6	,, ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,
Best "Rosemary" brand plain tiles	48 0	per 1000 ,, ,,
Best Ornamental tiles	50 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000 ,, ,,
Do. pressed	47 6	,, ,, ,,
Do. Ornamental do	50 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 6	,, ,, ,,

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15 10 0	16 10 0
Deals: best 3 by 4	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,,
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards—		
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,

	At per load of 50 ft. £ s. d.	£ s. d.
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOINERS' WOOD.

White Sea: first yellow deals,	At per standard.	
3 in. by 11 in.	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
,, ,, 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
,, ,, 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
,, ,, 3 in. by 9 in.	12 10 0	13 10 0
,, ,, battens	9 10 0	10 10 0

WOOD.—(*continued*).

	At per standard. £ s. d.	£ s. d.
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube	0 4 0	—

Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ...	7 5 0
Compound Girders, ordinary sections	8 2 6 ...	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ...	8 17 6
Flitch Plates	8 5 0 ...	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ...	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 5 0 ...	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0 ...	8 5 0
Staffordshire "Marked Bars"	10 0 0 ...	—
Mild Steel Bars	8 15 0 ...	9 5 0
Hoop Iron, basis price	9 5 0 ...	9 10 0
,, ,, Galvanized	17 10 0 ...	—
("And upwards, according to size and gauge.)		
Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ...	—
,, ,, 24 g.	10 15 0 ...	—
,, ,, 26 g.	12 5 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ...	—
Ordinary sizes to 22 g. and 24 g.	13 5 0 ...	—
,, ,, 26 g.	14 5 0 ...	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ...	—
,, ,, 22 g. and 24 g.	16 10 0 ...	—
,, ,, 26 g.	18 0 0 ...	—
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0 ...	—
,, ,, 22 g. and 24 g.	13 0 0 ...	—
,, ,, 26 g.	13 15 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0 ...	—
,, ,, ,, 26 g.	14 0 0 ...	—
Cut nails, 3 in. to 6 in.	9 0 0 ...	9 10 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 12 6 ...	—
Pipe in coils	15 2 6 ...	—
Soil pipe	17 12 6 ...	—
Compo pipe	17 12 6 ...	—
ZINC—Sheet—		
Vieille Montagne ...ton	27 5 0 ...	—
Silesian	27 0 0 ...	—
COPPER—		
Strong Sheet...per lb.	0 0 10½ ...	—
Thin ,, ... ,,	0 0 11½ ...	—
Copper nails ... ,,	0 0 11 ...	—
BRASS—		
Strong Sheet ... ,,	0 0 10 ...	—
Thin ,, ... ,,	0 0 11 ...	—
TIN—English Ingots ... ,,	0 1 4 ...	—
SOLDER—Plumbers' ... ,,	0 0 6½ ...	—
Tinmen's ... ,,	0 0 8 ...	—
Blowpipe ... ,,	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

	2d. per ft. delivered.
15 oz. thirds	1½d. ,, ,,
,, fourths	1¾d. ,, ,,
21 oz. thirds	2d. ,, ,,
,, fourths	2¼d. ,, ,,
26 oz. thirds	2¾d. ,, ,,
,, fourths	3d. ,, ,,
32 oz. thirds	3¼d. ,, ,,
,, fourths	4d. ,, ,,
Fluted Sheet, 15 oz.	2¾d. ,, ,,
,, 21 oz.	3½d. ,, ,,
⅛ Hartley's Rolled Plate	1⅝d. ,, ,,
⅜ ,, ,, ,,	1¾d. ,, ,,
¼ ,, ,, ,,	2¼d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 5
,, ,, ,, in drums	,,	0 1 8
Boiled ,, ,, in pipes or barrels	,,	0 1 8
,, ,, ,, in drums	,,	0 1 11
Turpentine, in barrels	,,	0 3 7
,, in drums	,,	0 3 9
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	,,	19 0 0
Best Linseed Oil Putty	per cwt.	0 6 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 6
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 16 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 6
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

R. G. A.—W. B. & L.—N. H. D.—W. M. S.—F. B. (Below our limit).—A. S. (Amounts should have been stated).

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

*** Denotes *accepted*. † Denotes *provisionally accepted*.**

ABERDEEN. — For laying permanent way and relative causewaying work for the dock railways, for the Aberdeen Harbour Commissioners. Mr. R. Gordon Nicol, engineer, Aberdeen:—

P. Tawse, Aberdeen £12,231 10 10

BARNSLEY.—For street works (Hope-street, Day-street, and Nursery-street), for the Town Council. Mr. J. H. Taylor, Borough Surveyor, Manor House, Barnsley:—

Hope-street.
G. Haigh, Harbro' Hills, Barnsley* .. £1,090 0 0
Nursery-street.
G. F. Brown, Park-road, Barnsley* .. 341 0 0
Day-street.
G. F. Brown, Park-road, Barnsley* .. 268 18 7

BISLEY, Surrey.—For new bath-room, lavatory, dressing-room, etc., at the Shaftesbury School, Bisley, for the National Refuges for Homeless and Destitute Children. Mr. R. Gardner Hammond, architect, 1, Essex-street, Strand, W.C.:—

G. Wade ... £390 10 0
J. Norris & Sons* ... 371 10 0

BLACKBURN.—For alterations to existing building to form bakery, linen-rooms, cloggers' workshop, etc., at the workhouse, for the Guardians. Mr. F. C. Rudd, architect, 4, King-street, Blackburn:—

W. J. Woof Cronshaw & Sons, Pump-street, Blackburn ... £1,150

BRENTFORD.—For 500 cubic yds. of blue Guernsey granite, for the Urban District Council. Mr. Noel Parr, Surveyor, Clifden House, Boston-road, Brentford:—

	per cubic yard. s. d.	
E. & H. Beevers	15 9	per cubic yard.
J. Hall	15 5	Fry Bros. ... 14
L. Sommerfeld	14 5	G. Le Maitre, Grosvenor-road, S.W.* ... 13 1
J. Mowlem & Co.	14 4	

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BRAMFORD.—For brick abutments for new bridge over the Navigation, Bramford, near Ipswich, for the East Suffolk County Council. Mr. H. Miller, County Surveyor, Ipswich :—

Pedrette	£1,265	Coe	£988
Grimwood	1,075	Double	954
Muirhead, Grieg, & Matthews	1,074	Wilkinson Bros., Finsbury Park*	890
Parkington	1,050		

BRIDGWATER.—For alterations to Market House buildings, for the Town Council. Mr. Francis Parr, A.M.I.C.E., Borough Surveyor. Quantities by Surveyor :—

T. Stockham	£295	C. Bryer, jun., Bridgwater*	£220
Gleed Bros.	289		

BRIDLINGTON.—For piling and other work in connexion with the new Southern Outfall, for the Sanitary Committee. Mr. E. R. Matthews, Borough Surveyor :—

E. Robinson	£1,400 0 0
T. C. Starkey	1,337 16 6
Harman & Langton	1,050 0 0
G. Bell, 29, Corporation-street, Manchester*	720 0 0

CHESHUNT.—For about 7,500 ft. of Norwegian granite channel, for the Urban District Council. Mr. R. H. Jeffes, Engineer and Surveyor, Manor House, Cheshunt :—

G. Mann	£898 0 0	M. S. Kelleringham	£689 13 9
J. Jackson	860 10 0	E. J. Betts	666 5 0
S. Gibbons	835 0 0	G. Porter	659 0 0
F. Hoffman	760 0 0	Griffiths & Co.	619 0 0
J. Mowlem & Co.	724 0 0	Grounds & Newton, Page Green, Tottenham*	603 0 0
Delaney	720 18 9		
J. Sheeham	697 0 0		

DUBLIN.—For electricity works plant, for the Lighting Committee of the Corporation. Mr. Spencer Harty, City Engineer; Mr. R. Hammond, Consulting Engineer :—

Lahmeyer Electrical Co.	£21,348	General Electric Co.	£19,227
D. Kerr & Co.	19,417	Electric Construction Co.	18,955

Alternative Tenders.

Lahmeyer Electric Co.	£22,250	General Electric Co.*	£19,227
Electric Construction Co.	21,789		

ELLAND.—For the erection of a villa in Victoria-road, for Mr. Broadbent Cragg, Victoria-road, Elland. Mr. F. F. Beaumont, architect, Southgate-chambers, Halifax :—

Mason: G. Readyhough, Langdale-street, Elland	£586 10
Joiner: J. Hawkyard, 6, Timber-street, Elland	190 0
Slater and Plasterer: C. Hutchinson & Sons, Timber-street, Elland	98 0
Plumber: F. Horsfall, Huddersfield-road, Elland	100 0

FRINTON-ON-SEA.—For sewering of Oxford-road, for the Frinton-on-Sea Urban District Council. Mr. E. M. Bate, Surveyor, Council Offices, Frinton-on-Sea, Essex :—

E. T. Bloomfield	£164 14 0	R. Moore	£130 3 9
T. Adams	160 3 6	Anderson & Dowson	123 6 3
G. Rackham	158 7 3	G. G. Rayner	122 11 6
C. W. Killingback & Co.	137 3 10	Wilson, Border, & Co., Romford, Essex*	118 9 5
J. C. Trueman	132 8 2		
C. E. Mackenzie	132 4 2		

FRINTON-ON-SEA.—For sewering of Raglan-road, for the Frinton-on-Sea Urban District Council. Mr. E. M. Bate, Surveyor, Council Offices, Frinton-on-Sea, Essex :—

G. Rackham	£251 17 4	J. C. Trueman	£189 9 6
T. Adams	235 10 0	Anderson & Dowson	187 8 6
C. W. Killingback & Co.	213 9 2	R. Moore	185 13 0
E. T. Bloomfield	201 17 2	G. G. Rayner	183 6 9
C. E. Mackenzie	194 10 6	Wilson, Border, & Co., Romford, Essex*	172 3 4

FRINTON-ON-SEA.—For sewering and making-up right-of-way by Harold-road, for the Frinton-on-Sea Urban District Council. Mr. E. M. Bate, Surveyor, Council Offices, Frinton-on-Sea, Essex :—

T. Adams	£693 17 2	C. E. Mackenzie	£623 13 8
Wilson, Border, & Co.	677 11 6	G. G. Rayner	623 0 2
E. T. Bloomfield	676 8 3	C. W. Killingback & Co.	564 3 6
G. Rackham	665 13 8	J. C. Trueman, Swanley, Kent*	542 0 0
R. Moore	664 13 3		
Anderson & Dowson	635 14 4		

FRINTON-ON-SEA.—For making-up and sewering Upper Station-road, for the Frinton-on-Sea Urban District Council. Mr. E. M. Bate, Surveyor, Council Offices, Frinton-on-Sea, Essex :—

Wilson, Border, & Co.	£2,424 11 11	J. C. Trueman	£2,161 5 7
G. G. Rayner	2,353 18 7	G. Rackham	2,130 14 2
T. Adams	2,319 19 11	C. W. Killingback & Co., James-st., Camden Town, N.*	1,979 3 0
E. T. Bloomfield	2,186 19 2		
C. E. Mackenzie	2,175 3 1		

FRINTON-ON-SEA.—For sewering and making-up right-of-way by Public Hall, for the Frinton-on-Sea Urban District Council. Mr. E. M. Bate, Surveyor, Council Offices, Frinton-on-Sea, Essex :—

G. Rackham	£168 10 6	J. C. Trueman	£134 13 10
E. T. Bloomfield	156 4 9	Anderson & Dowson	133 6 9
T. G. Rayner	154 7 6	C. W. Killingback & Co., James-st., Camden Town, N.*	124 1 2
T. Adams	150 19 3		
Wilson, Border & Co.	146 18 0		
R. Moore	143 7 7		
C. E. Mackenzie	135 0 0		

FRINTON-ON-SEA. — For making-up Cambridge-road, for the Frinton-on-Sea Urban District Council. Mr. E. M. Bate, Surveyor, Council Offices, Frinton-on-Sea, Essex :—

G. G. Rayner	£861 14 1	C. E. Mackenzie	£750 14 5
Wilson, Border, & Co.	849 15 8	C. W. Killingback & Co., James-street, Camden Town, N.*	670 0 7
T. Adams	849 1 4		
J. C. Trueman	808 8 4		
G. Rackham	799 9 4		
E. T. Bloomfield	791 14 4		

GLENTHAM (Lincs.).—For alterations and additions to elementary schools at Glentham, near Market Rasen, for the Lindsey County Council Education Committee. Messrs. Scorer & Gamble, architects, Bank-street-chambers, Lincoln :—

R. Ranyard	£274 18 1	J. Hill	£177 0 0
Mawer Bros.	234 0 0	G. Coles, Normanby-by-Lincoln*	170 0 0
S. & R. Horton	220 7 7		
F. Scarborough	186 0 0		

HORTON.—For tar-paving of airing-courts at Horton Asylum (8,496 superficial yards), for the London County Council :—

Constable, Hart, & Co., of Kentish Town* 1s. 4d. per superficial yard.

HERTFORD.—For additions to the Herts Reformatory, for the Herts Reformatory, Ltd. Mr. R. Gardner Hammond, architect, 16, Essex-street, Strand, W.C. :—

Ekins & Co.	£2,685 0 0	R. Ginn & Son*	£2,233 0 0
F. Hitch	2,474 10 0		
T. Hunt	2,433 0 0		

HEREFORD.—For alterations to premises in St. Owen-street, for Mr. T. C. Owens. Mr. W. E. H. Clarke, architect and surveyor, Cathedral-chambers, King-street, Hereford :—

W. Rowberry	£177	T. Hiles	£160
W. Bayley	175	C. Cooke*	156
W. Preece	171	R. L. Friend	150

[All of Hereford.]

HITCHIN. — For alterations and additions to Pegsdon House, Hitchin, for Mr. F. H. Bromwich. Messrs. C. E. Mallows & Grocock, architects, 28, Conduit-street, London, W. :—

A. Bavister & Son	£1,856	Harrison	£1,477
J. P. White	1,760	Warton & Dunstall	1,427
Strange & Son	1,619	Wilmot & Sons, Hitchin*	1,356
Page & Sons	1,520		

HITCHIN.—For hot-water supply, water softener, etc., for the Three Counties Asylum, Hitchin. Messrs. Middleton, Hunter, & Duff, civil engineers, 17, Victoria-street, Westminster, S.W. :—

	Hot water.	Softener.	Credit.	Net Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Doulton & Co.	3,522 11 2	2,342 18 7	—	5,865 9 9
J. Fraser & Son	2,841 12 4	1,578 16 8	30 0 0	4,390 9 0
C. J. Worsley	2,734 11 9	1,598 7 4	50 0 0	4,282 19 1
S. Owens & Co.	2,505 13 11	1,718 5 3	50 0 0	4,173 19 2
Wenham & Waters	2,387 0 0	1,694 0 0	10 0 0	4,071 0 0
H. Braithwaite & Co.	2,430 1 5	1,679 15 11	50 0 0	4,059 17 4
Mather & Platt	2,577 2 7	1,271 0 9	25 0 0	3,823 3 4
B. Parker	2,374 17 2	1,496 17 0	60 0 0	3,811 14 0
A. Stubbs	2,554 11 8	1,287 6 9	50 0 0	3,791 18 5
J. Simpson & Co.	2,296 0 0	1,395 0 0	10 0 0	3,681 0 0
H. F. May & Co.	2,364 0 0	1,332 0 0	20 0 0	3,680 0 0
Hiram Maxim Co.	2,253 8 3	1,522 0 2	110 0 0	3,665 8 5
G. N. Haden & Son	2,158 0 1	1,470 10 1	—	3,628 10 2
Gimson & Co.	2,297 3 11	1,342 19 7	20 0 0	3,620 3 6
G. H. Robinson	2,111 7 11	1,423 13 1	60 0 0	3,475 1 0
P. A. Allin & Sons	2,406 16 1	1,086 2 4	50 0 0	3,442 18 5
Jenkins & Son	2,266 2 8	1,114 15 3	—	3,380 17 11
H. F. Joel & Potter	2,242 0 0	1,125 0 0	55 0 0	3,312 0 0
Brightside Foundry Co.*	2,014 0 0	1,126 0 0	25 0 0	3,115 0 0
Lea & Warren	1,864 9 9	980 4 1	23 15 1	2,820 18 9

INGOLDISTHORPE (Norfolk).—For erecting six cottages and offices, for Mr. W. J. Lancaster. Mr. Louis F. Eagleton, architect and surveyor, King-street, King's Lynn. Quantities by architect :—

R. Shanks	£1,880 0	J. Chilvers	£982 0
W. H. Brown	1,289 0	A. Lincoln	980 0
J. Medwell	1,196 10	H. W. Barnes & Co.	948 0
S. Hipwell & Co.	1,095 0	F. Southgate	858 0
Tash, Langley & Co.	1,071 0	Chambers & Sons	857 0
Renaut Bros.	1,045 0	Riches & Son, Dersingham*	777 10
A. F. Foreman	1,020 0		
W. T. Crisp	1,017 0		

: Both lots of Cottages.

KETTERING.—For Loddington drainage, for the Kettering Urban District Council. Mr. T. Reader Smith, engineer, Market-place, Kettering :—

Wilkinson Bros.	£2,172 0 0	Goodman & Murkett	£1,910 0 0
A. Lewin & Son	2,035 0 0	C. Chamberlain	1,887 10 6
Kerry & Co.	1,982 0 0	F. Barlow, Rothwell*	1,805 0 0
J. Holme	1,971 14 6		

KETTERING.—For stables, for the Kettering Urban District Council. Mr. T. Reader Smith, engineer, Market-place, Kettering :—

Haycock & Sons	£424 0 0	J. Norris	£369 0 0
Brown & Son	423 0 0	S. Manton	366 15 0
Lewin & Son	393 0 0	H. Judkin	365 5 0
O. P. Driver	377 0 0	A. Johnson	362 16 0
Kettering Co-operative Builders	375 10 0	Smith & Bunning	359 0 0
A. Bamford	374 0 0	C. Andrew	355 0 0
Phillips & Slow	370 0 0	J. Goodwin, Kettering*	350 0 0

KINGHAM, Oxon.—For erecting a small house, for Mr. Basil de Selincourt. Messrs. Healing & Overbury, architects, Lloyd's Bank-chambers, Cheltenham :—

Messrs. Groves & Sons, Melton-under-Wychwood, Oxon* £825

KING'S LYNN.—For new stables, carriage-house, boxes, hay and straw loft, harness-room, etc., for Mr. T. Andrews, King's Lynn. Mr. Louis F. Eagleton, architect, King-street, King's Lynn. Quantities by architect :—

W. H. Brown	£469 0 0	Renaut Bros.	£425 0 0
R. Dye	459 0 0	H. W. Barnes & Co.	420 0 0
Read & Wildbur	439 0 0	A. F. Foreman	405 18 0
R. Shanks	435 0 0	Tash Langley & Co.*	403 0 0
Bardell Bros.	430 0 0		

LARGS.—For the construction of a storage reservoir, etc., on Noddsdate Water at Outerwards, for the Largs Town Council. Mr. W. R. Copland, C.E., 146, West Regent-street, Glasgow. Quantities by engineer :—

Kirkwood, Kerr, & Co.	£12,627 17 11	J. Osborne	£9,996 6 11
A. Stark & Sons	11,494 12 11	J. Young, Ltd.	9,982 18 10
R. C. Brebner & Co.	11,257 5 0	W. G. Flett	9,700 0 0
J. Urquhart	11,117 14 6	R. C. Crawford	9,418 6 4
D. Murray	10,831 8 6	Shanks & McEwan	9,080 12 10
J. Miller	10,531 6 0	P. McBride & Co.	8,661 3 11
W. Kennedy, Ltd.	10,245 6 5	H. Hastie, Bathgate*	8,120 11 7

LEAVESDEN (Herts).—For repairs to chimney stacks at Leavesden Asylum, near Watford, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief :—

J. Wilson	£890 0 0	Gardner & Hazell	£331 0 0
Blackburn, Starling, & Co.	882 0 0	S. P. Bidder & Co.	225 0 0
T. Robinson	589 0 0	Universal Engineering Co., Chesterfield-street, Nottingham*	199 0 0
G. Wiggs	510 0 0	C. J. Utley	137 10 8
W. Hogg & Son	392 0 0		
Alexander, Nevins, & Co., Ltd.	350 0 0		

LICHFIELD.—For Hazel Slade sewerage works, for the Rural District Council. Mr. C. O. Rawstron, Surveyor, 20, Walsall-road, Lichfield :—

Johnson & Langley	£526 8 6	Barker Bros.	£496 0 0
S. Wood	519 19 4	E. Blewitt, Hednesford, nr. Stafford*	495 5 2½
S. Barriet	502 8 6	R. Jewell	474 12 5
W. D. Oakley	497 18 4		

LIVERPOOL.—Blundellsands Hotel alterations and addition, for Messrs. Threlfalls' Brewery Co., Ltd. Mr. Frederick G. Fraser, architect, 19, Oldhall-street, Liverpool. Quantities by the architect :—

I. Dilworth	£4,300 0 0	S. Fowler	£3,643 0 0
J. Pyett	4,019 7 0	J. Taylor	3,640 0 0
R. Costain & Sons	3,900 0 0	G. Johnson	3,589 0 0
Brown & Backhouse	3,780 0 0	Broadbridge & Reid	3,517 0 0
		G. E. Johnson*	3,483 0 0

LONDON. — For masons' and paving work and materials, for the Hackney Borough Council. Mr. Norman Scorgie, Borough Engineer and Surveyor, Town Hall, Hackney, N.E. :—

	For One Year. Per cent. above Prices in Printed Schedule.	For Two Years. Per cent. above Prices in Printed Schedule.	For Three Years. Per cent. above Prices in Printed Schedule.
T. Adams	12½	12½	12½
G. Porter	10	8½	7
G. J. Anderson	5	Not filled in.	5
W. Griffiths & Co., Ltd., 35-39, Hamilton House, Bishopsgate St. Without, E.C.	3*	3	3
		Per cent. below Prices in Printed Schedule.	Per cent. below Prices in Printed Schedule.
D. R. Paterson	At prices in printed schedule	1¼	2¼
G. Battersby	Informal.	Dressing only quoted for.	—

LONDON.—For provision of conveniences, refreshment room, shelter, and foreman's offices, Manor House Gardens, for the London County Council :—

General Builders, Ltd.	£897	F. Lapthorne & Co.	£549
F. & H. F. Higgs	598	R. Harding & Son, London*	535
Holloway Bros., Ltd.	577		

TENDERS.—*Continued on page 567.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Shire Hall, Bury St. Edmunds	West Suffolk Standing Joint Com...	50*l.*, 30*l.*, 20*l.*	July 2

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Concrete River Wall (400 ft.)	Darlington Corporation	G. Winter, Borough Surveyor, Town Hall, Darlington	May 19
Iron Palisading at Gasworks	do.	do.	do.
Stores	Tyne Improvement Commission	Commissioners' Engineer, Berwick-street, Newcastle-on-Tyne	May 21
Additions to Altdinnie, Aboyne	Major C. Davidson	Jenkins & Marr, Architects, 16, Bridge-street, Aberdeen	do.
Stables	do.	do.	do.
Lime, Tar, etc.	Port Glasgow Town Council	W. Mackie, Gas Manager, Port Glasgow	May 23
Switchboard, etc.	Kirkcaldy Lighting Committee	O. F. Francis, Burgh Electrical Engineer, Kirkcaldy	do.
Alterations, etc., to Carbeal House, Torpoint		R. Wavish, Elm Cottage, Torpoint, R.S.O.	do.
Kitchen at Workhouse	Belfast Guardians	J. W. Robb, Clerk, Union Workhouse, Belfast	May 24
755 yds. of Unclimbable Wrought-Iron Railing	Rochdale General Purposes Com.	S. S. Platt, Borough Surveyor, Town Hall, Rochdale	do.
Removing Contents of Ashpits, etc., Stanwix	Carlisle R.D.C.	Clerk, 7, Victoria-place, Carlisle	do.
Police Station, Canterbury-road, Perry Barr	Staffordshire Joint Committee	W. H. Cheadle, County Surveyor, County-buildings, Stafford	do.
Rebuilding the Greyhound, Christchurch, nr. Newport	Messrs. Griffiths Bros.	Lansdowne & Griggs, Archs., Metro. Bank-ch'b'rs., Newport, Mon.	do.
Cattle Houses, etc., Trevego, Saint Winnow	Mr. J. B. Fortescue	H. W. Row, Clerk of Works, Yard Office, Boconnoc	do.
Road Works (Killder-street, Military-road, etc.)	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, Tynemouth	do.
Large Stable, Burraton Coombe, near Saltash		Jeffood & Sons, Quarry Offices, Burraton Coombe	do.
New Road, Provan Gas Works	Glasgow Corporation	A. Wilson, Engineer, 45, John-street, Glasgow	do.
Painting, Decorating, etc., of Bandstands	Leeds Corporation	City Engineer's Office, Leeds	May 25
Materials and Stores	Bolton Electricity Committee	A. A. Day, Borough Electrical Engineer, Spa-road, Bolton	do.
Eight Dwelling-houses, Dewsbury		T. Kershaw, Architect & Surv., L. & Y. Bank-chambers, Halifax	do.
Two Semi-Deta. Villa Residences, Burnley-rd., Halifax		G. Buckley & Son, Architects, Tower-chambers, Halifax	do.
Materials	Irlam U.D.C.	J. Cooke, Clerk, Council Offices, Irlam	do.
Paving, etc. (Labour only) and Hire of Steam Roller	do.	do.	do.
Structural Alterations in Basement of Market Tavern	Bradford Corporation	F. E. P. Edwards, City Arch., Whitaker-b'ldgs, Brew'ry-st., Bradf'd	do.
Materials	Ipswich Corporation	E. Buckham, Borough Surveyor, Town Hall, Ipswich	do.
Highway Work, Ashley, Baguley, etc.	Bucklow R.D.C.	J. Burgess, Highway Surveyor, Tabley Superior, Knutsford	do.
Heating, etc., Atherton Free Library		Bradshaw & Gass, Architects, Silverwell-street, Bolton	do.
Romanby Sewage Works	Northallerton R.D.C.	W. Fowle, Clerk, Northallerton	do.
Fencing and Laying out Land at Outfall, Rormanby	do.	do.	do.
Painting, etc., Workhouse, Smithdown-road	Toxteth Park Guardians	J. Moulding, Clerk, 15, High Park-street, Toxteth, Liverpool	do.
Painting Cemetery	Hove Corporation	H. H. Scott, Borough Surveyor, Town Hall, Hove	do.
15-ton Electric Crane	Coventry Corporation	J. A. Jeckell, Corporation Electricity Works, Sandy-la., Coventry	do.
Foundations, etc., Elec. Gen. Station, Summer-lane	Birmingham Electric Supply Com.	E. Harper & Bro., Arch., Ruskin-chbrs, Corporation-st., Birming'm	do.
Workmen's Cottages, Dalbeattie		C. C. Doig, Architect, Elgin	May 26
Creosoted Pine Sleepers	Bombay, etc., Railway Co.	T. W. Wood, Sec., Gloucester Ho., Bishopsgate-st. Without, E.C.	do.
Fishplates	do.	do.	do.
Stores (Tramway)	Sunderland Corporation	A. R. Dayson, Tramway Offices, Sunderland	do.
A Villa, Brynmawr	Mr. W. Jones	Mr. Jones, Draper, Beaufort-street, Brynmawr	do.
Four Houses	do.	do.	do.
Abutments, etc., of Bridge across Barnston Drain, etc.	Hull Corporation	A. E. White, City Engineer, Town Hall, Hull	do.
Granite	Feltham U.D.C.	G. W. Manning, Surveyor's Office, Feltham	do.
*Pa'ting Wks, Tooting Home, Elec. Bells, etc., Infirm.	Wandsworth Union	Clerk, Union Offices, St. John's Hill, S.W.	do.
Materials	Wilmslow U.D.C.	A. Scott Cartwright, Surveyor, Council Offices, Wilmslow	May 27
One 500 kw. 3 phase Induction Motor Generator	Sunderland Corporation	J. F. C. Snell, Boro' Electrical Engineer, Town Hall, Sunderland	do.
Portland Cement	Brighton Borough Council	F. J. C. May, Borough Engineer & Surveyor, Town Hall, Brighton	do.
Four Shops, with Arcade, in Market-place	Radcliffe U.D.C.	Engineer to Council, Council Offices, Radcliffe	May 28
Alterat'ns, etc., Penuel Welsh Cal. Meth. Ch., Ferndale		R. S. Griffiths, Architect and Surveyor, Tonypandy	do.
Sewage Works Extension (Contract No. 4)	Haworth U.D.C.	W. B. Woodhead & Sons, Engineers, 18, Exchange, Bradford	do.
Extension of Engin-hse., Electric Lgt. Wks., Sandy-la.	Coventry Corporation	J. E. Swindlehurst, City Engr. & Surv., St. Mary's Hall, Coventry	do.
Additions, etc., Railway-inn, Abertillery	Messrs. J. R. & T. A. Webb, Ltd.	R. L. Roberts, Architect, Abercarn	do.
Stabling	do.	do.	do.
Isolation Hospital	Thirsk R.D.C.	C. McC. Swarbreck, Clerk, Thirsk	do.
Joiner's Work, Salterhebble		G. W. Wilson, 3, Exeter-street, Salterhebble	May 30
Tar Paving, Norbiton Park Estate, New Malden	Maldens and Coombe U.D.C.	District Surveyor, Cambridge-road, New Malden	do.
Three Timber Groynes on South Beach	Lowestoft Town Council	G. H. Hamby, Borough Engineer, Town Hall, Lowestoft	do.
Private Street Works	Finchley U.D.C.	Surveyor, Council Offices, Church End, Finchley	do.
Painting Ventilating Shafts	Guildford Town Council	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford	do.
Converting Boiler House into Mortuary	do.	do.	do.
Vertical Fire Pumps	The L.C.C.	Clerk of the Council, County Hall, Spring Gardens, S.W.	do.
Four Mechanical Stokers	Warrington Electricity Committee	F. V. B. Mathias, Boro' Electrical Engineer, Howley, Warrington	do.
Water Softener and Purifier	do.	do.	do.
Fire-alarm System	Fulham Guardians	E. J. Mott, Clk., G'dians' Offices, Fulham Palace-rd., Hammersmith	do.
Alterations, etc., to Retail Fish and Poultry Market	Leicester Markets' Committee	E. G. Mawbey, Borough Engineer, Town Hall, Leicester	do.
Stores, Newton Bank	Winsford Industrial Co-op. Society	W. Fryer, Secretary, 21, High-street, Winsford	do.
Dwelling-house and Surgery, Aberbargoed	Dr. J. Thomas	G. Kenshole, Architect, Station-road, Bargoed	do.
Bonnybridge Drainage	Eastern District Com., Stirling C.C.	Warren & Stuart, Engineers, 94, Hope-street, Glasgow	do.
Offices, St. George's School, Abbey Hey	Gorton Education Committee	J. W. Wiles, Surveyor, Town Hall, Gorton	do.
*Double Culvert Arch and Single Culvert	Newton Abbot U.D.C.	J. Chudleigh, Architect, Newton Abbot	do.
*Road and Sewer Works	Hornsey Town Council	Council's Engineer, Southwood-lane, Highgate, N.	do.
*Painting, etc., Schools at Southall	St. Marylebone Guardians	Superintendent of the Schools, Southall	do.
Cable	Rotherham Corporation	Borough Electrical Engineer, Town Hall, Rotherham	May 31
Meters	do.	do.	do.
Materials	Septon R.D.C.	J. Roscoe, Highway Surveyor, Kirkby, near Liverpool	do.
Breaking Boulders, Paving, and Cartage	do.	do.	do.
Tar Macadam Shed, Olive Grove Highway Depot	Sheffield Corporation	C. F. Wike, City Surveyor, Town Hall, Sheffield	do.
Twenty Cottages at Chopwell	Consett Iron Co., Ltd.	C. E. Oliver, Architect, Office of the Company, Consett	do.
Twelve Cottages at Leadgate	do.	do.	do.
Reconstruction of Out-offices to Cottage, Consett	do.	do.	do.
Painting Police Stations, Driffield, etc.	Standing Joint Com. of E. Riding	County Surveyor, Beverley	do.
900 Yds. of 6-in. c.i. Pipes	Nelson Water Committee	J. Hartley, Waterworks Manager, Town Hall, Nelson	do.
Calvinistic Methodist Chapel, Abercanaid		C. M. Davies, 112, High-street, Merthyr	do.
Granite and Flints	Maldon Borough Council	T. R. Swales, Borough Surveyor, Municipal Offices, Maldon	do.
Ironwork (Sewerage Works, Contract 3)	Drighlington U.D.C.	J. Waugh, C.E., Simbridge-chambers, Bradford	do.
*New Post Office at Barnet	H.M. Works	H.M. Office of Works, Storey's-gate, S.W.	do.
Chancel, Sacristies, etc., St. Patrick's Cath., Newry	Rev. Dr. O'Neill	A. Bruntz, C.E., 1, College-street, Dublin	June 1
Clearing Stanley Grove Site	Manchester Royal Infirmary	E. T. Hall and J. Brooke, 18, Exchange-street, Manchester	do.
Hot-water Heating Apparatus, Technical Schools	Plymouth Education Authority	H. J. Snell, Architect, 11, The Crescent, Plymouth	do.
Paving Works	Littlehampton U.D.C.	H. Howard, F.S.I., Town Offices, Littlehampton	do.
Boundary Wall at Churchyard, Ainderby Steeple		Churchwardens, Ainderby Steeple Vicarage, Northallerton	do.
Buildings, Donegall-square South, Belfast	Scottish Temp. Life Assur. Co., Ltd.	S. C. Hunter, Building Surveyor, Wellington-place, Belfast	do.
Paving, etc., in High-street, Sheep-street, etc.	Petersfield U.D.C.	H. T. Keates, Town Surveyor, Petersfield	do.
Broken Granite	Enfield U.D.C.	R. Collins, Surveyor, Public Offices, Enfield	do.
Granite, Slag, Gravel, etc.	Rothwell U.D.C.	T. C. Betts, Surveyor, Market House, Rothwell, Northants	do.
*Extension of Town Hall	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Buckingham-road Works, Hampton	Hampton U.D.C.	S. H. Chambers, Surveyor, Public Offices, Hampton, Middlesex	June 2
*Supply, etc., of Furniture at New Library	Woolwich Borough Council	Council's Engineer, Maxey-road, Plumstead, S.E.	do.
Stone Bridge over the Swale at Hoggarth's, Mocker	Reeth R.D.C.	T. Brown, Surveyor, Low Row, Richmond, Yorks	June 3
1,000 Tons of Granite	Branksome U.D.C.	S. J. Newman, F.R.I.B.A., Coun.-cha., Branksome, P'kstone, R.S.O.	do.
*Supply Steam Piping and Painting and Whitewashing	St. George-in-the-East Guardians	Guardians' Offices, Raine-street, Old Gravel-lane, E.	do.
Section S. Motors	Pontypridd U.D.C.	R. P. Wilson, Engineer, 66, Victoria-street, Westminster	June 4
Colliery Timber	South Hetton Coal Co., Ltd.	J. R. Lambert, South Hetton, Sunderland	do.
Annual Contracts	Trustees of Clyde Navigation	Superintendent of Stores, 16, Robertson-street, Glasgow	do.
House, St. Abbs		E. K. Carmichael, Architect, 14, Queen-street, Edinburgh	June 6
Materials	Leeds R.D.C.	J. H. Ford, Clerk, Poor Law Offices, Leeds	do.
150 Tons of Rolled Steel Rails	Southampton Corporation	J. A. Crowther, Boro' Engineer, Municipal Offices, Southampton	do.
Recasting Cemetery Bell	Warrington Cemetery Committee	T. Longdin, Borough Surveyor, Warrington	do.
5,800 yds. of c.i. Water Mains	Epsom U.D.C.	W. V. Graham, M.Inst.C.E., 5, Queen Anne's-gate, Westminster	do.
*Alterations and Additions to Out-patients' Block	Gravesend Hospital Committee	The Secretary, Gravesend Hospital	do.
Making-up Lovelace-road, Long Ditton	Esher and Ditton U.D.C.	A. J. Henderson, Council's Surveyor, Thames Ditton	June
Cumwhinton Reservoir, etc. (Contract No. 1)	Carlisle Corporation	J. Mansergh & Sons, Engineers, 5, Victoria-street, Westminster	do.
Repaving Wandsworth Bridge	The L.C.C.	Engineer's Department, County Council, Spring-gardens, S.W.	do.
Part Repaving Vauxhall (temporary) Bridge	do.	do.	do.
Gas Installation at Technical Schools	Plymouth Education Authority	H. J. Snell, Architect, 11, The Crescent, Plymouth	do.
Storm-water Culvert at Low Lights, N. Shields	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, Tynemouth	do.
Heating of Tramway Depot	Bury Tramway Committee	A. W. Bradley, Borough Engineer, Bury	do.
*Making-up Roads	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	do.
*New County Court and Offices, Croydon	Commissioners of H.M. Works, etc.	Collector, Inland Revenue Office, Croydon	do.
*Erection of Electric Generating Station	Handsworth U.D.C.	Henman & Cooper, 19, Temple-street, Birmingham	June 8
Effluent Pumping Station, Beaumont Leys	Leicester Sewage W'ks. Committee	E. G. Mawbey, Borough Engineer, Town Hall, Leicester	June
Permanent Way and Paving Four Miles	Exeter Corporation	T. Moulding, City Eng'r, Mun. Offices, Southernhay West, Exeter	do.
Overhead Electrical Equipment	do.	do.	do.
Insulated Cables	do.	do.	do.
Twelve Double-Decked Single Track Motor Cars	do.	do.	do.
Reconstructing part of Promenade Pier	Ryde Pier Co.	T. R. Saunders, C.E., Belgrave-chambers, Ventnor	June 10
*New Coastguard Buildings at Leven, Fife	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
Sewerage and Sewerage Disposal, Lochmaben	Town Council	D. Balfour & Son, Eng'rs., 3, St. Nicholas-b'dgs, N'we'tle-on-Tyne	June 11
Stores	Cambrian Ry. Co.	Stores Offices, Cambrian Works, Oswestry	do.
*Erection of Bridge and Road Diversion Works	Erith U.D.C.	District Council Offices, Erith, Kent	June 13
*Additions, etc., to Electric Light Station	do.	W. Egerton, 12, Queen's-road, Erith	do.
*Main Drainage Works	Esher and Ditton U.D.C.	Council's Engineer, Portsmouth-road, Thames Ditton	do.
*Biennial Contracts, Repairs, etc., Home Dept. R.E.	War Office	Royal Engineer Office, 41, Charing-cross, S.W.	do.
* do. do. Caterham, etc.	do.	do.	do.
Two Continuous Coal and Ash Conveyors	London County Council	County Hall, Spring-gardens, S.W.	June 14
*Balcony Dwellings for Working Classes	do.	Architect's Department, 11, Charing Cross-road, W.C.	do.
*Additions to Technical Schools	Southend-on-Sea Corporation	Town Clerk, Southend-on-Sea	do.
*Making-up and Paving Street	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.	June 15
Insulated Cables and Overhead Conductors	Johannesburg Municipal Council	Mordey & Dawbarn, Engineers, 82, Victoria-street, London	July 4
24 Miles Electric Tramways	Shanghai Municipal Council	J. Pook & Co., 63, Leadenhall-street, London, E.C.	July 30
230 Tons of Steel Rails		Witty & Wyatt, Ltd., 88, Leadenhall-street, E.C.	No date
C.I. Warning Posts (Motor Car Act)	Southampton Corporation	County Surveyor, The Castle, Winchester	do.
Setting a New Boiler, 30 by 8		Manager, Aberbeeg Colliery, Aberbeeg	do.
Painting Schools and Caretakers' Houses	Newcastle-on-Tyne Education Com.	A. Goddard, Sec., Educa. Offices, Northumberland-rd., Newcastle	do.
Residence, Priory-road, Felixstowe		H. W. Buxton, Architect, Bank Corner, Hamilton-rd., Felixstowe	do.
Pair of Shops and Houses, Hamilton-rd., Felixstowe		do.	do.
7 Ton Steam Crane, Navvies	Tynemouth Corporation	Secretary of the Water Department, Town Hall Bldgs., Tynemouth	do.
Steam Bucket Hopper Dredger	Tralee, etc., Pier & Harbour Commrs.	C. E. Leahy, Secretary, Canal Offices, Tralee	do.
Furnishing Offices, etc., Crown-court, Carlisle	County Property Committee	C. W. Allan Hodgson, Clerk, Cumberland County Council, Carlisle	do.
Woodwork for August Show, Hillsborough-park	Sheffield & Ecclesfield Farmers' Club	V. Siddall, Wadsley Bridge	do.
130 Yds. of c.i. Pipes		Manager, Gas Works, Musselburgh, Edinburgh	do.
Linfield New Football Ground, Lower Windsor	Rowlands Gill Workmen's Club, Ltd.	128, Albion-place, Dublin-road, Belfast	do.
Latrine Water-closets		T. H. Stafford, Arch., South Garesfield Colliery, Lintz Green, R.S.O.	do.
New Road, Near Brecon	Birmingham Electric Committee	B. L. Pritchard, Surveyor, Brecon	do.
*New Electric Generating Station, Summer-lane	War Department	Ewen Harper & Bro., Corporation-street, Birmingham	do.
*Painting, etc., Works, Leicester and Strensall Camp		Royal Engineer Office, Fishergate, York	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Building Department Manager	Co-operative Wholesale Society	Not Stated	May 23
*Head of Engineering Department	Northern Polytechnic	275*l.*	June 8
*Teacher of Cookery	do.	110*l.*	do.
*Teacher of Architectural Drawing	do.	Not Stated	do.
*Teacher of Brickwork	do.	Not Stated	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xvi.

TENDERS.—*Continued from page 565.*

LONDON.—For construction of a public underground convenience at Lower Clapton-road, for the Hackney Borough Council. Mr. Norman Scorgie, Borough Engineer and Surveyor, Town Hall, Hackney, N.E.:—

W. S. Sharpin	£1,660	J. Parsons	£1,523
C. Castle & Son	1,615	Foster Bros.	1,500
A. E. Symes	1,600	W. Shurmur & Sons, Ltd., Riverside Works, Upper Clapton, N.E.*	1,485
Spiers & Sons	1,598		
S. Kind	1,575		
G. Jennings, Ltd.	1,572		

LONDON.—For repairs to the Islington station of the London Salvage Corps. Mr. Arthur F. Briggs, architect, 9, Queen Victoria-street, E.C.:—

Falkner & Sons	£966	Hayward & Son	£798
Ashby & Horner	898	Mansfield & Son*	744
Trollope & Sons and Colls & Sons	890		

LONDON.—For rebuilding premises at 112, Prince-street, Deptford, S.E., for the Lift & Hoist Co. Mr. John Jas. Downes, architect, 199, Lewisham High-road, S.E.:—

W. O. Collingwood* £557

LONDON.—For alterations to Nos. 1 and 2, Basing-place, and 43, 45, and 49, Kingsland-road, Shoreditch, N.E., for Messrs. Thos. Eaton & Co. Mr. John Jas. Downes, architect, 199, Lewisham High-road, S.E.:—

Snewin Bros. & Co.	£2,394 0 0	S. R. Best	£2,021 0 0
H. Groves	2,295 0 0	T. D. Leng	1,900 0 0
Sheffield Bros.	2,129 0 0	W. O. Collingwood	1,784 18 6
Josolyne & Young	2,095 0 0	R. Schooley & Son*	1,676 0 0
J. Ivey	2,050 0 0		

LONDON.—For the erection of combined bandstands and shelters, for the London County Council:—

—	Bostall-woods.	Hackney-downs and South Millfield.	Golder's-hill.	Little Wormwood-scrubs.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Duncan Tucker, Tottenham*	321 0 0	319 0 0 each	336 0 0	357 10 0
P. King & Co.	494 0 0	452 10 0 ,,	454 5 0	484 0 0
Grover & Son	409 0 0	409 0 0 ,,	465 0 0	466 0 0
W. H. Lascelles & Co.	459 0 0	459 0 0 ,,	470 0 0	555 0 0

LONDON.—For hardwood paving in the western part of Shacklewell-lane, for the Hackney Borough Council. Mr. Norman Scorgie, Borough Engineer and Surveyor, Town Hall, Hackney:—

—	Wilkinson Bros.	J. Mowlem & Co., Ltd.	Acme Flooring & Paving Co. (1904), Ltd.	G. J. Anderson.	Improved Wood Pavement Co., Ltd.	W. Griffiths & Co., Ltd.*
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.
Excavating for, and providing and laying concrete foundation, and Jarrah wood paving complete, per superficial yard	1 0 0	0 17 6	0 17 4	0 17 3	16 5‡	0 15 11
Extra excavation and cartage (if required) per cubic yard	0 5 0	0 4 0	0 5 0	0 3 6	5 0	0 3 3
Extra concrete (if required) per cubic yard	0 17 0	0 16 0	0 16 0	0 15 0	16 0	0 14 6
Fine extra concrete (if required) per cubic yard	1 1 0	1 3 3	1 1 0	1 7 6	18 0	1 8 0

‡ If Black-butt, 15s. 5d.

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LONDON.—For new factories, Wood Green, for Messrs. G. O. Barratt & Co. Mr. Francis L. Pither, architect, 91, Tollington-park. Quantities by Messrs. Westmoreland & Horder, 3, Pall-mall East:—

Butcher	£8,640	0	0
Smith & Son.	8,500	0	0
Moss & Co...	8,475	5	1
Ford & Walton ..	8,143	0	0
Allen & Sons	7,925	0	0
Patman & Fotheringham	£7,823	0	0
Parnell & Son	7,696	10	0
Willmott & Sons.....	7,337	0	0
Hawes, Wood Green*....	7,267	8	0

MANCHESTER.—For heating, etc., at the Bethesda Home extension, Cheetham Hill. Messrs. Maxwell & Tuke, architects, Manchester:—

Heating: Saunders & Taylor £259 10
Electric Lighting and Bells: Davenport, Sparrow, & Co. 118 0

NOTTINGHAM.—For the erection of additions to Albion Chapel, Nottingham. Mr. H. Allcock, architect, Nottingham:—

J. G. Short	£565	0	0
Wibberley & Son	530	0	0
Boothe*	£528	9	8

RAITH.—For 300 lineal yds. of fireclay pipes, etc., from Raith Gate along Boglily-road, for Mr. R. C. Munro-Ferguson. Messrs. W. D. Sangji & Lockhart, C.E., Kirkcaldy:—

Stratton & Co..	£327	8	0
A. Gray & Co..	325	15	5
D. Gilmour....	314	11	7
Macleish, Morrison, & Co. ..	308	3	0
A. Mitchell....	306	9	7
D. Whyte	£298	5	6
A. Fraser	289	18	6
W. Brown	276	1	3
D. Wright	265	1	0
J. Kennedy, Kirkcaldy*..	240	2	2

REDDITCH.—For shops and house, etc., Crabbs Cross, for the Alcester Co-operative Industrial Society, Ltd. Mr. J. W. Adams, architect, Hay Mills, Birmingham. Quantities by architect:—

G. Hains & Son ..	£1,638		
W. H. Gibbs.....	1,575		
E. Giles & Sons ..	1,497		
H. Surman	1,475		
C. G. Hains & Sons	£1,460		
T. Yeomans	1,450		
G. Huxley, Astwood Bank*	1,397		

ROTTINGDEAN.—For an open air swimming bath on land adjoining the Warren Farm School, for the Brighton Guardians. Mr. E. Wallis Long, architect, 40, Marlborough-place, Brighton:—

W. Olliver, Brighton* £500

RUTHIN.—For additions and alterations to premises, for the Ruthin County School for Girls. Mr. J. Hughes, architect, Denbigh:—

T. Jones	£1,200	16	0
T. Roberts ..	996	0	0
W. Roberts ..	956	0	0
J. Daniels....	844	12	0
R. Evans & Sons	£797	10	0
Williams Bros., Ruthin*	788	10	0

[Architect's estimate, £788.]

SLOUGH.—For erecting a branch shop in Stoke-road, for Slough and District Co-operative Society, Ltd. Mr. F. T. Deverell, architect:—

J. Deverill	£720		
H. D. Bowyer	700		
H. Burfoot & Son, Eton Wick*	£660		
L. B. Lane & Son ..	620		

SNETTISHAM (Norfolk).—For erecting six cottages and outoffices, for Mr. W. J. Lancaster. Mr. L. F. Eagleton, architect and surveyor, King-street, King's Lynn. Quantities by architect:—

W. H. Brown..	£1,269	0	0
J. Medwell....	1,210	0	0
S. Hipwell & Co.	1,095	0	0
Renaut Bros...	1,055	0	0
Tash, Langley & Co.	1,051	0	0
W. T. Crisp ..	1,013	0	0
F. Anderson ..	1,009	0	0
A. F. Foreman	995	0	0
J. Chilvers	995	0	0
A. Lincoln ..	£970	0	0
Barnes & Co.	948	0	0
R. Shanks‡ ..	1,880	0	0
Chambers & Sons, Snettisham* ..	857	0	0
F. Southgate	838	0	0
Riches & Son	771	10	0

‡ Twelve cottages.

SOUTHAMPTON.—For the erection of three blocks of artisans' cottages, north of Simnel-street, for the Corporation. Mr. C. J. Hair, architect, 23, Portland-terrace, Southampton:—

Martin Wells, & Co.	£7,620	0	0
H. Stevens & Co.	7,354	0	0
Wort & Way	7,270	9	7
Jenkins & Sons	6,936	0	0
Dyer & Sons..	£6,800	0	0
Golding & Ansell	6,459	0	0
J. Nichol, Southampton*	6,200	0	0

SUSWORTH.—For building an elementary school at Susworth, Scotter, for the Lindsey County Council Education Committee. Messrs. Scorer & Gamble, architects, Bank-street-chambers, Lincoln:—

J. W. Briggs ..	£896	0	0
J. E. Buttrick .	598	15	0
J. W. Thompson	560	0	0
A. Loughton ..	515	0	0
H. Kelsey	£513	14	8
H. S. Brown ..	510	0	0
G. R. Usher ..	495	0	0
F. Scarborough, Lincoln*	466	7	0

TIPTON (Staffs.).—For heating apparatus at new schools, Park-lane, for the Urban District Council. Mr. A. Long, architect, 21, New-street, West Bromwich:—

Kallaway & Co., Birmingham* .... £378 17‡
‡ Including £19 for an extra boiler.

TOTNES.—For new laundry, mangle-room, washhouse, etc., at the Union Workhouse. Mr. W. F. Tollit, architect, 10, High-street, Totnes:—

H. Drew.....	£876		
R. Veale & Son	819		
G. Leaman	780		
T. Brook, Totnes* ..	£747		
R. E. Narracott	735		

WALLASEY.—For construction of a branch railway to gasworks, including weighbridge, etc., for the Urban District Council. Mr. J. H. Crowther, engineer:—

R. White & Sons, Widnes..... £2,197

WATERFORD (Ireland).—For building two steel bridges (Ballyneety bridge and Bartihaels bridge), for the County Council:—

J. McGrath, Dungarvan* £1,985

WILMSLOW.—For residence at Wilmslow, Cheshire, for Mr. F. C. Lock. Quantities by Messrs. Groome & Bettington, Palace-chambers, Hereford:—

L. Brown & Sons	£901	10	
J. J. Parish	849	0	
Adkinson	828	0	
Peace & Norquoy	£810	0	
J. K. Coates, Wilmslow*....	797	7	

WOODBURN (Ireland).—For six hill cuttings, and building a bridge at Woodburn, for the Larne Rural District Council. Mr. John H. Brett, C.E., County Court House, Belfast. Quantities by engineer:—

Woodburn Bridge.

A. Rodgers, Carrickfergus £739 0 0

Hill Cutting.

J. Dale, Drains Lane	500	0	0
R. J. Stewart, Ballyboly, Ballynure ..	245	17	6
Do. Do. ..	204	17	6

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The Builder.

VOL. LXXXVI.—No. 3199. MAY 28, 1904.

ILLUSTRATIONS.

Proposed Façade for New Ironmongers' Hall, Fenchurch-street ..... Messrs. Hubbard and Moore, Architects.
"Coombe Field," Godalming ..... Mr. Gerald C. Horsley, Architect.
Waterworks Buildings, Clevedon, Somerset ..... Mr. H. Dare Bryan, F.R.I.B.A., Architect.
Ralston U.P. Church, Paisley ..... Mr. W. D. McLellan, Architect.
Additions to House, Kensington Park-road ..... Mr. R. A. Briggs, F.R.I.B.A., Architect.
New Screen, Dymock Church, Gloucestershire } ..... Mr. Roland W. Paul, F.S.A., Architect.
New Lectern and Reredos, Abbey Dore Church }

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Fire and Explosion Risks.

THE phenomenon known as "fire" is produced by rapid chemical reaction between certain forms of matter under certain conditions, while an "explosion" may be caused by the same reaction effected under other conditions, and at least an elementary knowledge of chemistry must be acquired before the laws which govern such reactions can be fully comprehended. The book on "Fire and Explosion Risks"* which has been written by Dr. Schwartz to meet the requirements of "non-chemists" will, however, enable even those altogether ignorant of chemistry to learn under what conditions the common articles of commerce take fire or explode, and what precautions should be taken to prevent the occurrence of the reactions which produce these phenomena.

The book is for the most part written in so clear and simple a style that any layman of average intelligence can readily understand it. Like other books of a similar character, it is apt to convey an exaggerated impression of the inflammable or explosive nature of comparatively harmless substances, and to occasion unnecessary anxiety. It is designed for the "use of fire insurance officials, fire brigade officers, members of the legal profession, law officers, councillors, factory inspectors, and factory owners," and it is probable that perusal of this book would induce some councillors and factory inspectors to at once issue rules of an unnecessarily vexatious character. For example, the stipulation that incandescent electric lamps must be protected by a double bulb and wire netting may be a reasonable requirement in the case of a celluloid factory, but would be altogether unreasonable if applied to every description of factory. Dr. Schwartz has, however, considered it his duty to draw attention to all the possible causes of fire and explosion, and it has therefore been impossible to avoid devoting a considerable portion of the book to the enumeration of some very remote dangers.

The chapters of direct interest to those concerned in the design and construction of buildings in general, and of factories in particular, are those which discuss fireproofing, lighting, heating, and the protection of buildings from damage by lightning; but the book also contains much information of general interest concerning the risks of fire outbreaks in buildings in which the various classes of commercial goods are manufactured or stored, and the precautions which should be taken to prevent such outbreaks.

In the chapter on fireproofing it is stated that of forty-four so-called antipyrenes (*i.e.*, fireproofing substances) tested by P. Lochtin, only the following twelve were found to be efficacious, viz., ammonium phosphate, ammonium sulphate, ammonium chloride, calcium chloride, magnesium chloride, zinc chloride, zinc sulphate, stannous chloride, alum, borax, boric acid, and aluminium hydrate.

Seventeen of the forty-four substances were found to actually favour combustion, and one of these was gypsum (calcium sulphate), but two pages further on gypsum boards for panels and roofing are said to have behaved exceedingly well when exposed to the action of fire. This apparent contradiction is due, no doubt, to the fact that when used as an antipyrene the gypsum is merely applied as a solution or paint to an inflammable material, and, although itself absolutely non-inflammable, it so injures the physical structure of the inflammable material that when exposed to fire the treated material offers a rougher and more exposed surface than the same material in its untreated condition.

The following are the first six of a list of nineteen general rules given for protecting specially dangerous establishments against "chemical" fire risks:—

(1) Granite, limestone, sandstone, and uncovered ironwork must be avoided in places where great heat may be generated and come into action. Ironwork (girders, pillars) must invariably be embedded in flame-proof materials.

(2) Cavities of any kind in roofs, walls, flooring, etc., must be filled up with uninflammable materials.

(3) Doors and windows must be made to open outwards. Where dangerous gases and liquids are produced or used there must be no communication, by way of doors or windows, with rooms containing open fires, lights, heating apparatus, or anything liable to generate sparks. Electroglass, a transparent fireproof variety of glass, is suitable for dangerous rooms, shops, show-windows,

* "Fire and Explosion Risks: a Handbook dealing with the Detection, Investigation, and Prevention of Dangers arising from Fires and Explosions of Chemico-Technical Substances and Establishments." By Dr. Von Schwartz. Translated by Charles T. C. Salter. London: Charles Griffin and Co. Ltd. 1904.

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and stairways. Doors should be of wood only, covered on both sides with tinplate.

(4) Stairways must be closed in and constructed of flame-proof material.

(5) Steam, hot water, or hot air should be the sole means of heating employed. Where stoves are unavoidable, they must be fired from the outside; and the joints must be kept tight, to prevent air entering the stove from the room. The stove pipes must not be placed near any woodwork, and the mouths of the pipes must be covered with a grating.

(6) The only means of lighting permissible are electric incandescent lamps, with double globes and wire cover, or properly protected outside lights. All taps, switches, etc., for the lamps must be placed outside.

The remaining rules are for the most part of interest to works' managers only.

The author's references to high-pressure incandescent gas-lighting are faulty and misleading. It is stated that "a pressure of one atmosphere (*i.e.*, nearly 15 lb. per sq. in.) is sufficient to considerably increase the illuminating power of coal gas, especially in incandescent burners," and that "to maintain this pressure where a number of burners are in question the working pressure in the pipes has to be increased to two to seven atmospheres (29 lb. to 103 lb.)." As a matter of fact, many of the high-pressure gas lamps in use in this country work under a gas pressure of less than ½ lb. per sq. in., and in no case is a pressure greater than 2 lb. required. The Lucas lamp, which is mentioned as a high-pressure lamp, is not a high-pressure lamp, but takes its supply directly from the supply pipes under the normal district pressure of less than one-tenth of a pound per sq. in. Its high efficiency is due to the use of a long chimney and the restriction of the air inlet around the burner head, so that a much larger proportion of air is drawn into the mixing tube of the burner than is drawn into burners of the common type. So far as ordinary luminous flames are concerned, the lower the pressure the better is the lighting efficiency of the gas.

Referring to lighting by means of incandescent electric lamps, Dr. Schwartz states that "celluloid articles soon explode when exposed to the heat of the incandescent lamp," also that a sixteen-candle lamp will char cotton in ten minutes, and a very slight draught will then suffice to set the cotton on fire, the bulb usually bursting afterwards. He considers that "for these reasons the protection afforded by a second bulb becomes highly essential." In a draper's shop, where flannelette articles may sometimes remain in actual contact with the electric lamps, the use of lamps with double bulbs and wire netting constitutes, no doubt, a wise precaution, but in everyday life there must be a limit even to the precautions to be taken against fire risks.

On the subject of electrical installations the author makes some very sensible observations. He remarks that the ordinary public is not in a position to judge whether an installation is properly carried out or whether the material is good; consequently, when the purchase of electrical plant is in question, the usual tendency is to give the contract to the party making the lowest tender. The result of this practice is that the plant is a constant source of danger from fire and a risky object of insurance, the danger increasing as the plant grows old. He recommends a thorough inspection of the plant once a year by a competent electrical expert. The greatest source of danger is short circuiting, "for, out of 128 fires known to have originated in electric plant in 1898 and 1899, sixty-three, or nearly 50 per cent., were attributable to this phenomenon."

One of the most interesting chapters of the book is that which discusses dangers from lightning. The lower end of a lightning conductor should, in the opinion of Dr. Schwartz, be connected to the town water mains wherever possible, and this connexion should be made not merely by winding the conductor several times round the water pipe, but also by soldering with suitable solder. Conductors should not, he says, be connected to gas mains, because gas might be ignited at a leaky joint, or the lightning might be conducted to a neighbouring gas meter or gas engine. The latter suggestion leads one to inquire whether, in the case of conduction along a water main, a water consumer in the act of drawing water from a stand-pipe would not be liable to receive a shock. Where no water main is available it is recommended that the lower end of the conductor be connected to a metal plate about 6 sq. ft. in area and grounded about 6 ft. deep in the soil or in the soil water. The popular practice of grounding the conductor in a well is condemned as dangerous.

The area protected by a lightning conductor is, according to Dr. Schwartz, "the conical space equal in height to the distance between the ground and the point of the conductor, and with a base comprising a circle with a diameter twice the height of the lightning rod. The apex of this cone coincides with the point of the rod, and if the conductor be properly installed everything within this area will be protected. The height of the rod is determined by the length of the roof; if the latter be 45 ft. long, a 15-foot rod will suffice, but it must be erected midway along the roof. In the case of very long straight roofs, a number of rods must be provided at intervals not exceeding four times their vertical height; and the rods at each end of the row must not be more than one and a half times their own height away from the ends of the roof."

Attention is drawn to the fact that isolated buildings fitted with lightning conductors which have remained undamaged for years have suffered injury from lightning shortly after a water or gas supply has been connected to the premises, the lightning having jumped from the conductor to the water or gas pipes. It is stated that instances of this kind have occurred in the case of churches at Greifswald and Stralsund, school buildings at Itzehoe, and elsewhere; and that gas explosions have been produced by such lateral discharges. It is further asserted that "a whole house may be rendered fairly proof against lightning by completely insulating it, cellar and all, floor and walls, by a thick layer of asphalte." The phrase "fairly proof" is somewhat vague, and no estimate is given of the cost of insulating a house in this manner.

WORKMEN'S COMPENSATION.

THREE decisions on workmen's compensation require noting, two of them having an important bearing on wages and earnings under the Workmen's Compensation Act. In Midland Railway Company *v.* Sharpe the House of Lords have affirmed the decision of the Court of Appeal, and held that certain sums paid to a railway guard to meet his lodging or board expenses on occasions when his duties prevented him from returning to his own home were rightly computed as his wages for the purpose of assessing compensation. In James *v.* Ocean Coal Company the Court of Appeal have laid down a principle on the question of assessing compensation where an injured workman is capable of earning something after an accident. A workman employed as a hauler in a coal mine suffered an injury by accident at a time when his earnings, including certain percentages, amounted to 34s. a week. Whilst incapacitated he was paid 17s. a week by his employers, but eventually he was offered and was able to undertake work in the lamp-room at 29s. 5d. At that time the percentages paid to men in his old employment had dropped, and had he been still engaged as a hauler he would only have made 29s. 5d. His compensation was stopped when he resumed work, and he applied for arbitration, claiming the difference between 29s. 5d. and his old wages, 34s. The county court judge refused to award any sum, since he laid it down as a principle that the wages on which the compensation was originally fixed must be treated as subject to the variation of wages earned by persons engaged in similar work, and that hence in this case there was no "difference" to award. The Court of Appeal held this enunciation of the principle to be erroneous, since the maximum sum originally fixed is entirely independent of subsequent fluctuations. It is to be observed that when an arbitrator has to determine what is the difference between the weekly earnings before the accident and the amount the man is able to earn after the accident, under schedule 1, par. 2, of the Act he is vested with an absolute discretion, and hence it was only in laying down a fixed principle that he was wrong, and not in refusing to award any compensation in such circumstances. The third case, Stephens *v.* Dudbridge Ironworks, is one of extreme importance to employers who wish to avoid litigation by effecting a compromise. The injured workman was an apprentice under age, living with an uncle, who stood *in loco parentis*, but not as legal guardian. The employer, through the uncle, agreed to pay compensation under the Workmen's Compensation Act, and took a receipt from the infant purporting to be an election on his part to receive compensation under the Act in full satisfaction. Subsequently the uncle was duly appointed guardian, and an action was brought at common law claiming damages for the

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injuries sustained in the accident. The Court held that, being an infant, and the contract to receive compensation instead of damages not being for his benefit, he was not estopped from bringing his action, as he would have been had he been of full age, by virtue of section 1, 2*b*, of the Act

SIENA AT THE BURLINGTON CLUB.

SIENA seems to be in the air at present. Mr. Douglas Langton's lectures some little time ago at the Royal Institution, to which we referred at the time, presented an excellent historical and critical sketch of the architectural art of Siena, and of the character of the people who made it. There is at present at Siena itself an exhibition of her ancient art, of which we shall have something to say on another occasion; and the Burlington Fine Arts Club has collected in its well-known upper room what can be got together from English owners to illustrate Sienese art. This exhibition, though small, is a very representative one. The works are arranged as nearly as can be in chronological order, and we follow the course of Sienese art from its earlier purely decorative paintings, with their flat gilt surfaces, to the more free and pictorial style of Benvenuto and Beccafumi.

It is not an exhibition to arouse popular enthusiasm. Sienese painting, in its early and more characteristic forms especially, appeals to an acquired taste; its style and its interest are so totally different not only from picture-painting as a modern art, but from the better-known forms of early Italian Renaissance art. Giotti is a familiar name to many who have hardly heard of his Sienese contemporary Duccio di Buoninsegna, and his works have a natural and dramatic expression which many can understand who would find the Sienese painter only interesting, if at all, as a historical study. But that is the value of an institution like the Burlington Club; it brings before us works for which there would be no demand in a popular picture-gallery.

The little walled town on the top of a rock, which has attracted so many lovers of ancient art of late years, seems indeed to have been as much shut up and fenced in æsthetically as it was materially and politically. Her art pursued its own path, and dwindled from inanition and isolation just as the great art of the Italian Renaissance was reaching its largest development. To come into the Burlington Club room is like going into a separate and obscure compartment of art history, where things are attempted and judged by a special standard quite apart from that which rules in the great world of Renaissance painting. Stiff and formal is the art shown here; that of producing small pictures of sacred subjects, rather symbolical than illustrative, and decorated with gold backgrounds and nimbi so as to produce almost the effect of a kind of jewellery. Beauty of a kind there is in many, not in all; for, at the risk of rousing the contempt of the amateur in things of Siena, not a few of the works here are interesting, to the non-collecting mind, more as curiosities than in any other sense. In the preface to the catalogue this restricted interest of Sienese art seems to be recognised, and the reader prepared for it in advance, by the remark that "Men will always do them less than justice until they realise that the Sienese painters simply did not choose to follow the broad road trodden by their fellow artists." We reject the conclusion. Our opinion is that the earlier Sienese painters were a set of men isolated (to a great extent) by circumstances, and confined within a narrow round of their own, from which they could not escape. That they did not even try may be true enough, but we do not know that they were any the more praiseworthy for that. Among the later painters we do indeed see evidence in this room of a certain choice in style, for if we compare Benvenuto's (1470-1524) four scenes from the Life of Christ, No. 54 in the catalogue, with his "Portrait of a Lady" (52), it is difficult to realise that they are by the same painter, the Christ scenes being purely conventional painting in a stiff style, and the portrait showing how near the artist could go to nature if he chose. But among the paintings of two centuries earlier there seems no evidence of any power but that of painting missal-like miniatures of a decorative stamp. They shut themselves up in this, but they have left us a little curiosity-shop of art which has its own peculiar interest.

Among the examples of Duccio represented are four scenes from the Life of Christ: The Woman of Samaria; the Temptation on the Mount; the Raising of Lazarus; and "Follow Me, and I will make you Fishers of Men." There is a naïve attempt in all these to tell the story in a plain and recognisable manner. In the "Lazarus" the nearest figure to the resuscitated corpse puts his drapery to his nose, reminding one of a similar homely incident in Orcagna's fresco at Pisa. Architectural backgrounds play a considerable part in the scenes, especially in the "Temptation," and are of some interest, as being no doubt based on what the painter was in the habit of seeing around him. The best work of Duccio that is exhibited is however the "Crucifixion" (4), which belongs to his last period, and shows a considerable advance in the drawing and grouping of the figures; the figure of the centurion especially is noticeable, and might be assigned to a much later date if seen alone. The arrangement of the six very conventional angels in the sky around the head of the cross reverts to the purely decorative conception of a scene. In several of the paintings of this period, by Duccio and others, the folds and creases of the drapery are lined out and modelled by gold lines; the expression in the catalogue in regard to one of these, "a dark blue robe heightened with gold," is hardly the right way to put it; the gold lines are not a decorative treatment of the drapery, they are the method employed for modelling it, in order to combine drawing with decorative effect.

The curious picture, attributed to "the School of the Lorenzetti" (16), in which a number of scenes from the lives of hermits of the Thebaid are combined into one painting, only linked together by the foreground landscape with its river, though anything but beautiful, is worth studying as a curiosity, and is full of odd illustrations of mediæval religious legend. Among the curious incidents is the representation of an angel as a nude figure with a gold nimbus; the only instance we can recall of a nude angel in early art.

A quarter of a century or so later we come on the examples of Simone Martini, the most characteristically Sienese of all the artists of Siena.* His "Christ Found in the Temple" (18) is a fine example of a form of art which may be said to be midway between painting and decorative illumination; a cabinet picture in which sumptuous decorative effect is kept in view in every detail, not excluding, however, grace and beauty in some of the figures. The picture is in its original very well-preserved Gothic frame, with a cinquefoiled arch in low relief forming a suggestion of a canopy over the picture. A still better example of Martini is the picture called "Scenes from the Life of Christ" (21), in which the two figures representing the Annunciation, the angel in a panel on one side of the frame and the Virgin in the opposite panel, are of real beauty and expressiveness. Here again we see the practice of lining out the drapery folds with gold.

Space will not permit of our doing more than mentioning a few other of the most interesting among the works exhibited. The Annunciation by Giovanni di Paolo (1403-1480) is noteworthy, among other things, for the curious and elaborate architectural details—the gables in concave curved lines with a gold boss in each tympanum, with the careful effort to draw them in perspective, and the canopy or roof of segmental section, divided into small squares of alternate green and gold, and each ornamented with a square flower like the "dogtooth" ornament of Early English architecture. In the picture of "St. Bernardino Preaching," by Vecchietta (1412-1480), we come on entirely Renaissance architecture—pilasters with gilt classic capitals, gilt consoles, etc.; though this is much the same date as Giovanni di Paolo's much more Gothic architecture just referred to. In the "Flagellation of a Saint" (38), of the School of Matteo di Giovanni (1430 *circa*-1495), we have a most orderly Renaissance classic treatment, niches with pilasters and small pediments, etc.; while in another interior of the same school and date (43) there is a curious mixture of orthodox classic detail with long clustered Gothic shafts. The architectural student will notice the row of wide round-arched niches of almost purely Roman character which form the base of the architectural composition. The "Madonna and two Saints" (48), by Pietro di Domenico (1457-1501), is noticeable for the tender expression in the graceful head of the virgin.

The later works have less of interest, since the peculiar Sienese style of decorative treatment has been abandoned, while the freedom and beauty of the greater Renaissance are not reached. The large "Venus" of Girolamo del Pacchia (1477-1535) is an ugly nude,

* Simone Martini, it may be as well to observe, is the painter who, owing to a mistake of Vasari's, who confounded him with Lippo Memmi, was known in art histories till a comparatively recent period as Simone Memmi. We have found the mistake still lingering in an Encyclopædia published only ten or fifteen years ago.

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with nothing to recommend it. There is spirited action in the "Flight of Clœlia," by Beccafumi, the most prominent of the later names (1479-1549); but then for the kind of thing it is not good enough. The Roman background, with the naïve representations of the Castle of St. Angelo and the Colosseum (neither of which of course existed at the supposed date of Clœlia), is interesting as an exemplification of the historic confusion of mind in regard to ancient Rome.

There are two cases of objects illustrating the minor arts in Siena. Among these are to be noted some curious triangular tiles from the original pavement of the Piccolomini Library at Siena, bearing the Piccolomini cognisance of a yellow crescent on a blue ground; a magnificent illuminated initial letter on vellum (case A, 10); a circular dish of rich and unusual ornament (A 12); an illuminated frontispiece of the Book of the Biccherna for the year 1460 (A 15); and some interesting porcelain work and painted wooden panels in case B. In the room downstairs is a splendid frame in carved walnut wood, about as fine an example of wood-carving as could be seen, attributed to the school of Antonio Barilli. This is lent from South Kensington, and may be known to some of our readers already.

The greater part of the collection, however, consists of work not generally accessible or known except to collectors and students. "Do you know anything of early Sienese art?" we asked a friend a day or two since. "Not now," he replied, "but I shall next week; I am going to the Burlington Club." That is the real value of these exhibitions at the Burlington Club; they afford opportunity for the public—those who care to seek admission—to extend their knowledge of art-history; an opportunity greatly aided in this instance by Mr. Langton Douglas's learned and interesting treatise which forms the preface to the catalogue.

NOTES.

A New Nile Bridge. Owing to the greatly increased traffic across the Nile at Cairo the bridge known as the Grand Pont de Kasr-en-Nil has for a long time been inadequate for the requirements of the city. A scheme was prepared some time ago for substituting a steel superstructure for the existing iron span so as to increase the width of the bridge by nearly 20 ft., but nothing has been done in this direction up to the present. A still more useful project, however, is now on the point of being commenced—namely, the construction of new cross-river communications to connect Old Cairo with Ghizeh. The plans for this undertaking were prepared in 1902 by the instructions of the Public Works Ministry, and the works, which are about to be taken in hand, will include a bridge 500 metres long by 20 metres wide, spanning the main branch of the Nile between Ghizeh and Roda Island, and two subsidiary bridges 85 metres long by 12 metres wide between Roda Island and Old Cairo. New roads to the length of more than 2,000 metres are also to be constructed on the island, and there is no doubt that the new communications will be much appreciated by residents and visitors alike. The western abutment of the main bridge will be at the commencement of the Pyramids Road, and we presume this point will ultimately be connected by a new tramway route with the central quarter of the city.

Lake Cheesman Dam. Next to the new Croton dam the most important work of the kind in the United States is the dam intended to create the Lake Cheesman reservoir for the water supply of Denver, Colorado. It was designed as a gravity dam, but owing to the configuration of the gorge the natural form of structure for the site is curved in plan. As the full section of a gravity dam could be retained in conjunction with the arched form, and without involving additional masonry, the up-stream face was curved to a radius of 400 ft. The dam is built of granite masonry laid in Portland cement mortar, and the foundation is solid granite rock. Measured from the average level of the foundation to the roadway, the total height of the dam is 227 ft., the thickness being 176 ft. at the base, and 18 ft. at the level 190 ft. above datum, this thickness being maintained to the top of the structure. It is estimated that the pressure against the dam will be that due to a depth of 224 ft., which considerably exceeds the depth of water against any previously built structure of the kind. Compared with such well-known examples as the Villar, Periyar, and Furens dams, this work seems somewhat slender, but, on the other hand, the base being considerably longer than the top, the small radius of curvature, and the superior quality and weight of the masonry constitute elements of strength that should not be overlooked.

"Tenement Factories." The question of what constitutes a "tenement factory" was again before the Courts in the case of Brass *v.* London County Council (20 Times L. Rep. 464). Tenement factories are defined by the new Factory and Workshop Act, 1901, as factories "where mechanical power is supplied to different parts of the same building occupied by different persons for the purpose of any manufacturing process or handicraft in such manner that these parts constitute in law separate factories," and the meaning of this section has been interpreted to include only tenement buildings used as factories when the mechanical power is derived from one source. The building in question consisted of three floors and a basement, and was occupied by a paper-cutting company which supplied its own mechanical power, manufacturers of paper and wood boxes who did the same, and by Brass, who on his part of the premises used no mechanical power. The two businesses each supplying themselves with separate mechanical power rendered this not a factory to which section 14, which provides for means of escape in case of fire, had application. This decision practically follows that in the case of Toller *v.* Spiers and Pond, on which we commented in our issue of December 27, 1902, and seems to direct attention to a flaw in the Act, since there can be no less risk, but rather greater danger, from fire where mechanical force is being generated in separate parts of the building than when it is drawn from one source, and seeing that such undertakings are becoming more common in these days of larger buildings, and the larger the building the greater the risk of fire and the increased probability of mechanical force being separately generated on the floors in different occupation, all such buildings should certainly be brought within the ambit of the Act.

Gas Supply to Successive Tenants. The case of The Gas Light and Coke Company *v.* Cannon Brewery, commented upon by us in our issue for March 21, 1903, has been carried to the House of Lords, and the decision of the Court of Appeal has been reversed, and the case of Gas Light and Coke Company *v.* Meade, decided in 1876, has been reinstated. The question decided is one of general importance. The Cannon Brewery had purchased the interest of a former tenant in certain premises, and were carrying on his business there. The former tenant had left his gas rate unpaid, and the Gas Company were trying to render the Brewery Company liable for these arrears. The Gas Company based their claim upon section 18 of their Act of 1872, which provides—

"In case any consumer leave the premises where gas was supplied to him without paying the rate or meter rent due from him, the company shall not require from the next tenant of the premises payment of the arrears so left unpaid unless the incoming tenant agreed with the defaulting consumer to pay the arrears, or unless the incoming tenant shall continue the trade or business of the outgoing tenant, and shall have paid to ——, the outgoing tenant, a consideration for so doing, but the company shall, notwithstanding any such arrears, in the absence of collusion between the outgoing and incoming tenant, supply gas to the incoming tenant as required by this Act on being required by him to do so."

The Brewery Company did not require any gas to be supplied, therefore the Gas Company were unable to bring any compulsion to bear by cutting off the gas supply, but the Court of Appeal held that since the requirements of the section as to carrying on the business, etc., were fulfilled, in this case the Gas Company could "require payment" of the arrears by action against the Brewery Company. The House of Lords have reversed this decision in considered judgments, the ground of which may shortly be stated to be that unless the incoming tenant "requires" the Gas Company to supply gas the section does not apply at all. Where however the incoming tenant desires a supply of gas his position may not be so satisfactory, as the Gas Company may then make a contract with him making the supply conditional on his paying arrears, if he is continuing the business within the section, or even if he is not may possibly cut off the supply. This latter point remains in doubt; it was so decided in Meade's case, but this was overruled in the Court of Appeal. The Lords have reversed the Court of Appeal, but on another ground, and Lord Davey specially states this question to be left open, although he intimates that Meade's case may have rightly decided it. Incoming tenants requiring gas had better make agreements with the outgoing tenant as to arrears if they continue on

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his business, until such time as the law on these matters is made to accord a little more with justice and equity.

Radium.

ON Friday evening of last week Professor Rutherford, of Montreal, gave a most interesting address at the Royal Institution on "Radiation and Emanation of Radium." The lecturer first gave a brief summary of the properties of radium. It is known that it is continually giving off three kinds of radiations, and an emanation which is a gas-like substance. The *alpha* rays carry positive charges of electricity, have very little penetrative power, and only suffer deviation when passing through very strong magnetic fields. The *beta* rays have much greater penetrative power, carry negative charges of electricity, and are easily deflected by a magnet. The *gamma* rays are not affected by a magnet at all, and have very great penetrative power. They seem to be very similar to Röntgen rays. The emanation given off by radium behaves like a gas, and is condensed by cold. When a radium salt was dissolved in water this emanation was liberated, and it possessed 75 per cent. of the characteristic powers of radium. Professor Rutherford stated that this emanation from radium was not a stable element, but was continually changing into something else. Under certain circumstances some atoms of the radium became unstable and split up, being shot off at great velocities. These fragments of atoms formed transition elements. He calculated that in 50,000 years a mass of radium would have ceased to exist, the fragments of the atoms that once composed it forming new substances. Sir William Ramsay has shown that the radium emanation produced helium, and there was now considerable experimental evidence proving that the atoms forming the alpha rays were atoms of helium. The lecturer was of opinion that radium was itself a transition element, and so must be produced from some other element. The amount of radium in the crust of the earth was sufficient to account for the rise of temperature as we go downwards. Lord Kelvin's limit as to the age of the earth, therefore, which was deduced from considering it as a sphere cooling in space, would have to be modified. This would enable the physicist to grant the biologist and geologist the lengthy periods they require for evolution.

The Whirling of Shafts.

IN a valuable paper read to the Physical Society on March 11, and published in the *Philosophical Magazine* for May, Dr. Charles Chree, F.R.S., has discussed the problem of the "whirling" of shafts, and has given what appears to us to be the true solution. The phenomenon of whirling is well known to electricians and also to the manufacturers of high-speed engines. When an engine and a dynamo are directly coupled together there are many cases on record of the shaft fracturing at a particular speed, although a very large factor of safety had been allowed. In most cases no flaws in the metal at the fracture could be discovered, and the orthodox explanation of the phenomenon was that the period of some oscillation of the crank shaft, synchronised with a periodic fluctuation of the electrical load on the dynamo, thus setting up resonance. Professor Dunkerley has discussed the problem very fully, both theoretically and experimentally, in a lengthy paper published in the Philosophical Transactions for 1894. Dr. Chree shows that the very lengthy formulæ given by Dunkerley can be simplified, and he gives one or two simple formulæ that will be most useful to the engineer. The method he adopts of getting these formulæ is due to Lord Rayleigh, and the result is a triumph of mathematical ingenuity. We see that the explanation of whirling is extraordinarily simple, and the wonder is that apparently no one has ever thought of it before. When a shaft held at one or both ends is acted on by forces tending to bend it, on the removal of these forces it tends to return to its original straight position; in doing so it overshoots the mark, and so a lateral vibration is set up. If the shaft be rotating round its longitudinal axis and be displaced laterally, the elastic forces tend to bring it back to the undisturbed position, but the "centrifugal forces" have exactly the opposite effect; they diminish the righting forces, and so make the vibrations slower. In the particular case when the period of rotation of the shaft equals the period of its lateral vibration, then the righting power vanishes and stresses of any magnitude can arise. When the rotors of the dynamos or the fly wheels or pulleys fixed on the shaft are heavy the period of the lateral vibration is low, and experience has proved that the whirling that ensues can fracture any shaft, however strong. We had occasion two years ago to study several cases of shafts breaking due to whirling, and Dr. Chree's formulæ seem to us to be in exact accordance with practical experience.

London Medical Officer's Report.

THE Report of the Medical Officer of Health for the City of London, for 1903, deals of course very largely with matters which do not come into our province—purely medical questions of the adulteration of food, provisions in regard to infectious disease, etc. Among points which affect the construction of buildings, the subject of the kitchens of restaurants is considered at some length, and the medical officer expresses the strong opinion that underground kitchens in hotels and restaurants should be discountenanced, and that if the London County Council General Powers Bill 1904 comes into operation, it would be to the public advantage to abolish underground kitchens by law, at all such places. On this subject the medical officer remarks—

"Without mechanical means, it is almost impossible to properly ventilate a kitchen placed in a basement. In many cases the ventilation has to be partially obtained by means of open gratings on the footway pavement—indeed in some instances nothing else can be had. As a consequence, mud, filth, and dust finds access to the kitchens—indeed, it is a common thing to observe marks of expectoration through these gratings, one occupier even being obliged to attach a brass notice requesting the casual passer-by not to spit down one of the openings. Others attach movable trays beneath, but this only partly obviates the evil."

The want of proper sanitary accommodation for both sexes, in connexion with hotel kitchens, is also strongly commented on. Complaints are also continually received of want of proper sanitary accommodation in connexion with offices, especially in cases where women are employed as clerks. These points should be taken into consideration by those who are planning and erecting hotels, restaurants, or offices.

Harcourt House, Cavendish-square.

THE freehold of No. 19, on the west side of the square to which it has a frontage of some 154 ft., with a depth of 112 ft., is offered for sale. Formerly known as Bingley House, it was erected (of stone) in 1722-3 for Robert Benson, Lord Bingley, after whose death in 1731 it was purchased by Simon, second Viscount and first Earl Harcourt, who sold it to William second Duke of Portland. Amongst the King's collection of drawings in the British Museum is preserved a copy of J. Rocque's print, showing the original design:—

"As it was drawn by Mr. [probably Thomas] Archer, but built and altered to what it now is by Edward Wilcox, Esquire."

The square was laid out as Oxford-square in or about 1717, on land in Marylebone-fields that belonged to the dower which Lady Henrietta Cavendish Holles brought, in 1713, to her husband Edward Harley, second Earl of Oxford and Mortimer. The stabling and offices at the rear, in Welbeck-street, of Harcourt House were built by Samuel Ware. Whilst the mansion, latterly occupied by the Marquis of Breadalbane, has been shorn of the somewhat forbidding features which were commented upon in the "New Critical Review of the Public Buildings in London," 1736. Its high front wall, courtyard, and general air of seclusion give it an unusual aspect, which is less common in London than in the older aristocratic faubourgs of Paris. The house is plotted in Rocque's map of 1744-6. For some time it had no neighbour in the square other than the two wings (on the north side) attributed to Edward Shepherd (though some say by John James) of the mansion of which the King's Library contains a print by H. Hulsbergh, dedicated to the Duchess of Chandos and lettered:—

"The elevation of a new house intended for His Grace the Duke of Chandos, in Marybone Fields. Designed by John Price, Architect, 1720. J. Price, Inven. et Del. H. Hulsbergh, sculpt."

Price's elevation does not show the two wings. The one at the corner of Chandos-street appears in T. Malton's aquatint of July, 1800. Both have been rebuilt since.

Changes in Lothbury and Old Jewry.

THE new premises which have just been completed, after Mr. Arthur Blomfield's designs for the London and Provincial Bank (and described in our number of April 30), stand upon the site of a portion of the block of five houses, New Bank-buildings, erected at that corner of Prince's-street and Lothbury in 1808-10 from designs by Sir John Soane; the houses, of which Nos. 1 and 2 remain, with their façade now broken, were built when he widened and straightened Prince's-street, taking some of the ground for his enlargement of the Bank of England. In the Soane Museum is a set of plans, signed by him, and entitled "The Five Houses in Prince's Street called 'New Bank Buildings,' erected 1807-1810 upon ground recently bought

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by the Bank of England." The land was bought for 20,000*l.* from the Grocers' Company. The same collection contains some variant designs for the premises No. 19 in Old Jewry, which completed the block on the west side. No. 19, Old Jewry, was built by Soane in 1818-9 for the National Debt Redemption and Life Annuities business. It has lately been rebuilt by Mr. Arthur Blomfield, Messrs. W. Cubitt and Company being the contractors, for occupation by the Public Works Loan Office; the now vacant space between No. 19, Old Jewry, and No. 3, New Bank-buildings, is reserved for a new National Debt Office, in complement of Mr. Arthur Blomfield's scheme for the entire group of offices. Soane designed also (1811) Thellussons' banking-house in Meeting House-court, named after the Meeting House, which, with three other messuages and some almshouses, formed the site of No. 19 and a space at the rear. The almshouses had been founded there with a bequest in 1551 by Dame Elizabeth Morys of her property in the parish of St. Olave Jewry to the Armourers' and Braziers' Company, who sold the Morys trust estate in that quarter for 10,000*l.* to the Governors of the Bank of England. Soane's plans plot the sites of the Grocers' (former) Hall and garden, the old Meeting House, the court (formerly Windmill-court), and the almshouses in Old Jewry.

Morland's Pictures at South Kensington.

THE collection of pictures in the large upstairs gallery at the Indian Museum testifies that poor, besotted George Morland must have been a diligent worker in his sober intervals, or that he worked pretty fast. As an artist, he was well worth commemorating by a centenary exhibition, and the collection shows more variety of subject and purpose in his pictures than he is generally credited with. The best, however, are of the class of subjects by which he is best known; farmyards and farm animals, horses more especially. Among the best of these are "Winter" (24), in which the white cow foreshortened is admirable; "The Blind White Horse" (27), unable to find the water-trough, which in its way is quite pathetic; "Horses in a Stable" (64); "The Piggery" (69); and the life-size painting of a dog (76). The pictures in which landscape forms an important element show that Morland had an intuitive feeling for composition, though the treatment of foliage, both in regard to colour and detail, is very mannered; a point, however, in which greater painters of the same period can keep him in countenance. There are two or three seashore scenes, which have all nearly the same composition (Nos. 8, 17, and 60); the large one entitled "Wreckers" (17) has a fine wild effect of storm in it, but the treatment of the sea is poor. One of the best and most effective pictures of Morland's favourite class of subject—"The Catastrophe"—is not in the collection; it represents with great force and spirit the collapse of a farmer's cart and all its passengers by the fall of the horse. The picture was at one of the Burlington House loan exhibitions a good many years ago, and we were rather disappointed not to find it in the South Kensington collection.

RECENT EXCAVATIONS IN THE ROMAN FORUM.

The news of the discovery within the large concrete base which probably belongs to the equestrian statue of Domitian* (*Builder*, January 2, 1904, p. 3) of a block of travertine containing, in a nearly square cavity, five specimens of prehistoric pottery, created a considerable sensation in archæological circles. Upon March 9 Commendatore Boni, in searching for traces of the inaugural ceremonies which he supposed had been observed when the monument was dedicated, came upon a slab of travertine embedded some 3 ft. deep in the concrete of the base. The slab was 4 ft. square and 1 ft. thick, and on its removal the next day it was found that it covered the block of travertine already referred to, which was of the same dimensions, and contained, in a cavity of slightly trapezoidal shape, the sides of which are each 2 ft. in length and the depth 1 ft., five pots, which resemble very closely those which have been, and are still being, discovered in the prehistoric cemetery close to the temple of Antoninus and Faustina. One of them is globular, red, with striated sides; another is a small black amphora with a double spiral incised decoration; two others are small black cups, with incised decoration; while the fifth is, to borrow an everyday analogy, of the shape of a clotted cream pot, yellowish, with bands of red painted upon it, and one small handle in the upper part.

The vases were left *in situ* for a few days, and then removed one by one in the presence of the King of Italy, who has taken a considerable interest in the present excavations. In the largest was found a piece of unrefined gold, but a few pieces of pitch and some fragments of tortoiseshell were the only other objects that were detected in the earth in which the vases were embedded.

The meaning of the discovery is anything but clear. Commendatore Boni believes the vases to have been placed in the stone at the ceremony of the inauguration of the monument—the laying of the foundation stone, as we should call it—and the custom would thus be one of those which has come down to us from very early times. It is perhaps curious that no "coins of the realm" should have been found; copies of contemporary newspapers we could not expect. But there are more serious objections. In the first place, could an equestrian statue of an emperor be regarded as a sacred building, and therefore be "inaugurated" with solemn rites? And, in the second place, how came these prehistoric vases to be available at the time of Domitian?

We should have to suppose that a store of them was preserved by the priests for use on such occasions. We know that the *simpuvium Numæ* (King Numa's sacrificial bowl, which was made of rough earthenware, and black in colour) continued to be an object of veneration for many centuries, and the brotherhood of the Arvales, one of the most ancient of the priesthoods, prayed and sacrificed to vases which had come down to them from remote antiquity. In fact, when excavations were made on the site of their sacred grove in 1868, some fragments of undoubtedly prehistoric pottery were discovered which may have belonged to some of these very objects of veneration.

We are told that they were extremely like the specimens which had come to light in the primitive cemeteries of the Alban Hills, and utterly dissimilar from the pottery of a later date, which was habitually found in the excavations of Rome and its neighbourhood. (It is, however, to be noticed that they were not found in any part of the sacred buildings, but in an underground chamber, the character of which is not more nearly defined.)

This fact is of considerable weight in connection with the present discovery, but there is a certain amount of difference between the preservation of prehistoric pottery as an object of worship and the existence of a stock of it which was available for use when required for inaugural purposes. If, on the other hand, we suppose that vases of this primitive nature were still manufactured (even for sacred purposes alone, for which in several cases, *e.g.*, in the worship of Vesta, the use of earthenware vessels always formed part of the prescribed ritual) in the 1st century, A.D., we are in danger of upsetting the whole of our chronological system of the development of the potter's art.

It is not that the secret had necessarily been lost. Commendatore Boni, after many experiments in order to find out how the ancients had made it, was able to imitate the prehistoric pottery almost exactly—so exactly in fact, that he was obliged to date the pots he had made in order to avoid confusion! But such a survival of a primitive style of manufacture would be difficult to admit, from what we know of the development of art and decoration in Rome.

Another theory has been suggested by Professor Barnabei, the ex-director of the Department of Antiquities, in one of the daily papers (*Giornale d'Italia*, April 2), and merits consideration. Further investigations on the south-west side of the base have revealed the presence of a portion of a human skeleton at a very considerable depth below the level of the Forum of the Imperial time, and below many different strata, each representing a period of human life, so that it would seem that here there had been a burial-ground at some remote date. Is it not possible that in the course of the construction of the base the workmen came upon a prehistoric tomb, and, out of respect for the dead, enclosed the vases from it in the solid concrete mass? But, it may well be asked, what happened to the remains of the deceased? for no ashes and no bones were found in any of the vases. Professor Barnabei's explanation, therefore, cannot be treated as altogether satisfactory; but, as we have seen, Commendatore Boni's is open to certain objections also. In the meantime, the discovery remains one of the most mysterious of the many inexplicable finds that have been made during the present excavations.

Between the base of which we have been speaking and the temple of the deified Julius Cæsar there has come to light the concrete base of another statue, of similar construction. In both cases the concrete, which was below the ground level, has been allowed to set between planks supported by vertical beams, and has not been faced in any way. Remains of the wood itself may, in fact, often be seen in such concrete constructions, and the marks it leaves are always clear.

The new base stands in front of the temple of Castor and Pollux, where Livy (IX., 43) tells us that an equestrian stature was erected in honour of Quintus Marcius Tremulus, consul in 306 B.C., and conqueror of the Hernici, a tribe who dwelt in the mountains to the south-east of Rome. There are no remains, however, at present to be seen of this early monument, though the excavations are by no means complete, and have not yet been carried to any great depth. What is visible at present is merely the upper portion of a concrete base of the Imperial period, perhaps, on which rest some blocks of travertine, belonging to some still later restoration, as the concrete has been cut away to take them. There are also one or two of the marble blocks of the actual pedestal.

In the course of the excavations a fragment of a marble architrave, bearing the words "Profelicitate," came to light, which fitted on to another fragment previously discovered, with the names of the Emperors Arcadius and Honorius, and of Aurelius Symmachus, the well-known statesman of the last quarter of the IVth century, A.D., who dedicated the monument to which the architrave belonged.

The south-east end of the Forum of the late Republic was marked by a road, traces of which have been found beneath the foundations of the temple of Julius Cæsar, erected after his death, and under those of the Arch of Augustus, which stood between this temple and the temple of Castor and Pollux. The road would have passed just south-east of the last-named temple, between it and the *Lacus Juturnæ*—the basin in which the sacred spring of Juturna still rises.

Immediately to the north-west of, and parallel to, this road ran a line of those small rectangular pits lined with slabs of stone which have been found in other parts of the Forum, and are believed to have some ritual significance. Here, as on the south-west and north-west sides—in front of the Basilica Julia and the Rostra respectively—they may well be held to mark the limits of the open area of the Forum of the time of Julius Cæsar and Augustus, just as those which run in three parallel lines near the

* The discovery of a hole in the centre of the base, which would have served to contain a support for the body of the horse, has rendered the attribution of the base to this statue more probable, for hitherto it was a little hard to see how the three shallow cavities in the blocks of travertine, in which the hoofs were supposed to have been fixed, could have been a sufficient foundation for so great a weight as a bronze equestrian statue about six times life-size.

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boundary between the earlier Comitium and the earlier Forum preserve the older (solar) orientation. Seven of them have so far been discovered, of which two are beneath the foundations of the temple of Cæsar.

In the Basilica of Constantine the marble pavement is now being exposed to view, and, though it is much damaged, several pieces of it, composed of elaborate patterns of different-coloured varieties, are visible. But it is the primitive Forum and the cemeteries that preceded it that are now the object of the greatest interest; and it is difficult to foresee what discoveries the future may have in store for us. The exploration of the necropolis close to the temple of Antoninus and Faustina is not yet complete; and already traces of another close to the great concrete base in the centre of the Forum have been found, and await further investigation. It will be interesting to see whether these burial grounds belonged to different tribes or no, and to what extent they confirm the traditional history of the origins of the city of Rome.

THOMAS ASHBY, JUN.

COMPETITION FOR THE NEW STOCK EXCHANGE, MANCHESTER.

THE designs submitted by architects in this competition were exhibited in the present Stock Exchange, Manchester, last week. Six local firms had been invited to compete, and on the advice of the assessor, Mr. J. J. Burnet, A.R.S.A., F.R.I.B.A., the Committee have selected the design prepared by Messrs. Bradshaw and Gass of Bolton, the estimated cost of which is 30,000*l*. The conditions of the competition were carefully prepared and it is probably due to Mr. Burnet that they were so favourable to the competing architects. The number of drawings was limited and the small scale of 16 ft. to an inch was specified for all the plans, elevations, and sections; one sheet of details to a scale of 4 ft. to an inch was, however, required. To each firm submitting a design in accordance with the conditions a fee of fifty guineas was promised. The accommodation desired for the purposes of the Stock Exchange was given in detail, the principal room being a "house" or "market" to measure 80 ft. by 50 ft. or thereabouts, but the competitors were also asked to provide a number of offices and other rooms which could be let to tenants and also to state the annual rental which these might be expected to produce. With reference to these offices the competitors were allowed a free hand, but the Committee stated that they had been advised that a number sufficient to produce a rental of 1,800*l*. could be provided in the building in addition to the accommodation required for the Stock Exchange. The site is a rectangle in the centre of the city, almost equidistant from Market-street and Cross-street, and measures about 120 ft. by 100 ft. It is bounded on or towards the north by Norfolk-street, on the west by Pall Mall, on the east by Sussex-street, and on the south by Kent-street. All these streets are narrow, the two last being little more than alleys. Norfolk-street is the widest of the four, but Pall Mall has probably the largest amount of vehicular traffic. These facts do not appear to have been considered in all their bearings by some of the competitors. It is obvious that the best position for the private offices (that is to say, those intended to be let) is on the Norfolk-street front, and that the frontages to Sussex-street and Kent-street are the least suitable for this purpose. Stock-exchanges, we are told, are sometimes not unlike bear-gardens, but perhaps this is a libel; be this as it may, the "house" ought not to adjoin either of the two principal streets, and the Committee-room ought certainly to be placed so that the noise of the traffic will not prove a nuisance. The difficulties of the problem were increased by the fact that there are ancient lights on the opposite sides of the streets, and the competitors were informed that the heights of the external walls of the new building must not exceed those of the buildings now on the site.

In the accepted design by Messrs. Bradshaw and Gass the "house" measuring 78 ft. by 49 ft. is on the ground floor and occupies nearly the whole of the rear half of the site towards Kent-street; five rooms for telephones and telegrams are placed at the Pall Mall end of the "house," and the members' smoke-room, reading-room, and cloak-room at the other end. The principal entrance is at the highest part of Norfolk-street near Sussex-street, a small lobby for the porter and also three small inquiry-boxes being placed on the left of the vestibule. Between this and the north-east corner of the "house" are the principal hall and staircase (28 ft. by 18 ft.), and the members' lavatories are to the right of this with windows in a small central area. Another entrance for members is shown on the Pall Mall front as required by the conditions. Two entrances are provided for the private offices, one in Pall Mall and the other in Norfolk-street, and five private offices are shown on the ground floor on the Norfolk-street-front, the staircase for these being lighted from the central area. The arrangement of this floor is excellent, and in the planning of the Stock Exchange portion the internal architectural effect has been carefully considered. The position of the principal entrance near the highest part of the site has the advantage of allowing the basement-rooms to be better lighted than in some of the other designs. In the basement the accommodation includes five private offices and two strong-rooms towards Norfolk-street, and a private show-room towards Pall Mall, and also the Stock Exchange clearing-room, clerks' lavatories and smoke-room, messengers' room, stores, and heating and ventilating rooms. On the first floor, the secretary's office is placed over the principal vestibule, etc., the general office (28 ft. by 19 ft.) over part of the hall and over the lavatories, and the Board-room (32 ft. by 22 ft.) over the smoke-room and reading-room on the Sussex-street side of the building. The strong-room adjoining the Board-room is not altogether satisfactory, as two of the adjacent walls are carried by girders over the room below. Nine private offices are provided on the Norfolk-street and Pall Mall fronts, and are approached by two staircases; the lavatories, etc., are lighted from the central area. The greater part of the "house" is carried up through this story. Fifteen private offices are shown on the second floor, together with two staircases, lavatories, store-rooms, etc.; on the third floor there are eleven private offices, etc., and a telegraph-operators' room (30 ft. by 29 ft.) with kitchen and lavatory, etc.; on the fourth floor in the highest part of the roof are the battery-room, and another room which can be let or divided to form a caretaker's house. It will be seen that forty-five private offices and a show-room are provided in this design, and nearly all are on the two principal fronts of the building. The office corridors on the first and second floors are not well lighted, but the plans as a whole are decidedly good. The elevations are also meritorious. The principal front (towards Norfolk-street) has a central portion in five bays, rusticated to the top of the ground story; the office entrance is in the middle bay, and the wide opening in each bay on the ground floor is spanned by a segmental arch. Pilasters run through the two upper stories to the main cornice, with bay windows between them on the first floor, and three-light windows on the second floor, the lights having columns between and at the sides. The third floor rooms are lighted by dormers. The principal entrance (to the left of the central portion) is lacking in dignity, and is surmounted by two pairs of coupled columns supporting an entablature and curved pediment, in the tympanum of which a window is placed. This portion of the building is terminated at a lower level than the central portion on account of the ancient lights in Sussex-street. A similar feature is adopted to the right of the central portion, but with a window on the ground floor instead of a door. The detail drawing differs considerably from the small-scale drawings, and is in many respects an improvement, but the entrances generally are somewhat feebly designed. The internal details shown on the ¼-inch scale have considerable merit; the "house" has marble columns and a central dome with toplight and pendentives, and the internal effect will probably be satisfactory, although the numerous arches of different curvature and the method of supporting the dome do not strike us as altogether happy.

Messrs. Willoughby and Langham have submitted two complete designs (A and B) and also alternative elevations of Design B. In Design A the whole of the ground floor, with the exception of the staircase to the private offices, is devoted to the Stock Exchange. The principal entrance is in the same position as in the accepted design, and affords access through a large vestibule to the "house," which measures 80 ft. by 50 ft. and has one end towards Sussex-street, the longer sides being (as in the accepted design) parallel to Norfolk-street. The telephone-room is placed between the rear side of the "house" and Kent-street, and is unnecessarily large (80 ft. by 14 ft. 6 in.). The messengers' room, secretary's office, general office, and typist's room, and the second entrance to the Exchange extend along the whole of the Pall Mall front on this floor, and the Norfolk-street front is entirely occupied by the entrances to the Exchange and to the private offices, and by the waiting-room, cloak-room, and lavatories, and one side of the typist's room. On the first floor, the smoke-room, lounge and reading-room are placed over the telephone-room and approached by stairs from the "house"; the Committee-room is over the secretary's and general offices on the noisiest side of the building (the Pall Mall front), and four private offices are provided on the Norfolk-street side. Seventeen private offices are shown on the third floor, approached by one staircase only, and the messengers' kitchen is also on this floor; the corridors depend for their light to a very large extent on borrowed lights. The third floor contains the telegraph-operators' room (43 ft. by 26 ft.), mess-room, and battery-room, and six private offices, and on the fourth floor (in the roof) are rooms for the caretaker or for private offices. In the basement there are four private offices and a large private ware-room (65 ft. by 44 ft.), clearing-room, clerks' smoke-room and cloak-room, etc. Altogether this design provides only thirty-one private offices and a ware-room, and the best portions of the ground and first floors are almost exclusively occupied by the minor rooms of the Exchange.

Design B is in some respects more satisfactory, three private offices on the Norfolk-street front being provided on the ground floor, but the smaller rooms of the Exchange and the upper part of the "house" occupy the whole of the first floor. Fourteen private offices are shown on the second floor, one group of four being badly designed *en suite*, so that three must be traversed in succession to reach the fourth. On the third floor there are twelve private offices, and four on the fourth.

The elevations are well designed, the roofs being well managed and the detail good, and the internal effect of the houses would be very pleasing, but the plans are not as compact as in the accepted design, and the private offices are less numerous.

In Messrs. T. Worthington and Son's design, the "house" is planned in the shape of a Greek cross with four short arms, one of which adjoins Sussex-street. The telephone-room is placed between the "house" and Kent-street, the secretarial department along the Pall Mall front, and the library and committee-room adjoining Norfolk-street. Between the secretarial department and the house is a wide corridor or hall approached at one end from Norfolk-street and at one side from Pall Mall. This is an excellent plan, but does not provide any private offices on the principal floor. On the first floor there are ten private offices with two staircases, etc.; and also a balcony and smoke-room for members. On the second floor there are eighteen private offices grouped around the dome of the "house," but there is only one staircase for these; twelve private offices are provided on the third floor, and there are the telegraph-operators' rooms and a private studio on the fourth floor. The stairs are not very well arranged, but a lift is provided up to the third floor. The elevations are spoilt by a curious and (as far as we can see) unnecessary gap on the second and third floors of the Norfolk-street front, and two windows shown on the plan in the Pall Mall front do not appear in the elevation.

Messrs. Waddington, Son, and Dunkerley place the "house" in the same position as in Design A submitted by Messrs. Willoughby and Langham, with the telephone-room, two smoke-rooms, and two groups of conveniences alongside Kent-street, a large vestibule, members' entrance, and cloak-room adjoining Pall Mall, and the reading-room, two private offices, and staircase, and the principal entrance for members towards Norfolk-street. This is an excellent arrangement but the upper floors are less satisfactory. The secretarial department and committee-room occupy the best positions on the Norfolk-street and Pall Mall fronts on the first floor, these rooms and eleven private offices being arranged in a quadrangle around the upper part of the central portion of the "house," and the only direct light to the corridor around the quadrangle is at the two staircases.

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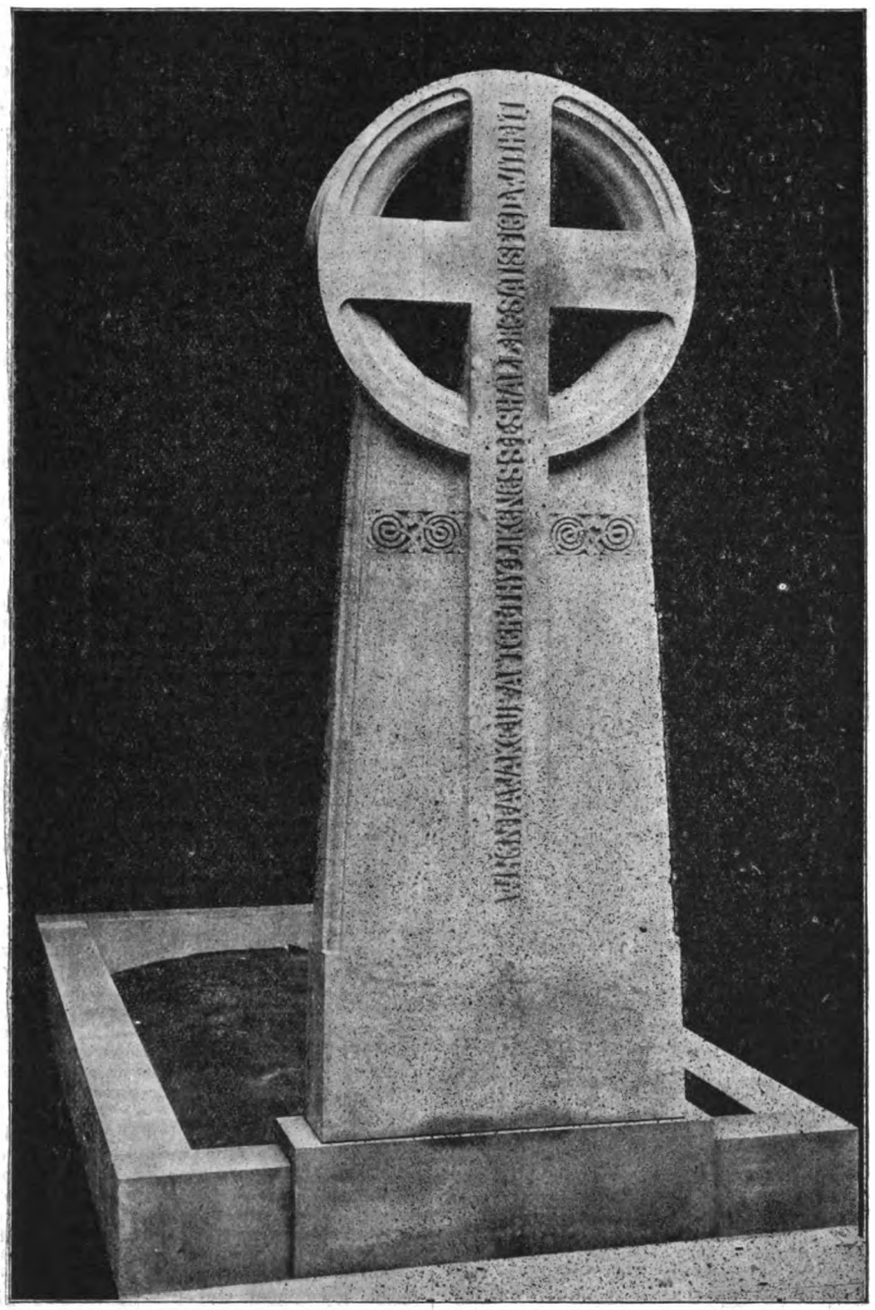

Monumental Headstone, Eastbourne Cemetery. Mr. H. H. Statham, Architect.

On the second floor there are twenty-two private offices, and a room of insufficient size for the telegraph operators; here, again, part of the corridor is inadequately lighted. Twenty-four private offices are shown on the third floor and ten on the fourth. This design provides a greater number of private offices than any other design. The principal elevations are freely treated, and some of the detail is rather crude; the principal feature is an arcade on the second floor with rusticated columns supporting semicircular arches, and with a square-headed window in each bay. The elevations to Kent-street and Sussex-street have been left to take care of themselves and do not exhibit any attempt at grouping or ornament.

Messrs. J. Beaumont and Son have placed the "house" along the Pall Mall front, and show a shop at the angle of Norfolk-street and Sussex-street, and four private offices behind this in Sussex-street and Kent-street. Seven private offices are provided on the first floor, eleven on the second, and nine on the third. The elevation to Pall Mall is effectively grouped, but the planning is defective, particularly in the location of the various rooms.

The sixth competitor was Mr. T. Sington.

NEW VICARAGE, DARESBURY, WARRINGTON.—The foundation stone of a new vicarage at Daresbury was laid recently. Messrs. W. and Segar Owen are the architects for the work, the builder being Mr. W. Wood.

MONUMENTAL HEADSTONE, EASTBOURNE CEMETERY.

THIS is a head-stone for the grave of a lady of Cornish family, and the form and treatment were therefore based on a type found among ancient Cornish crosses—the open or pierced cross at the head of a stele or slab with pyramidal outline. In this case the line of the sides has an entasis. Some of the Cornish crosses of this type have a simple decoration in the shape of a groove or channel up the centre. As two texts were to be carved on the stone, this ancient form suggested the idea of treating the texts as a vertical ornament up the centre of the cross on each side; the spaces between the letters being sunk, leaving the lettering flush with the face of the stone. On one side the inscription, reading upward from the bottom to the top, runs—"When I awake up after Thy likeness, I shall be satisfied with it"; on the other side—"Her children rise up and call her blessed."

The memorial inscription, on the other side, is in gun-metal letters let into the stone on the blank space below where the cross commences; the side shown here being really the back, as it was not desired that the inscription should be included in the illustration. The other side is, however, the same, except that the letters "A" and "Ω" are worked into the band of transverse ornament.

The design is by Mr. H. H. Statham, and was carried out in Hopton wood stone, by Messrs. Farmer and Brindley, from his detail drawings.

ST. MARY THE VIRGIN, ALDERMANBURY, CHURCH.

BY their resolution, carried with only two dissentients, on the 20th ult., the parishioners, who own the advowson, recorded for the fourth time since 1862 their rejection of the Bishop of London's proposal to pull down this church and unite the benefice to that of St. Lawrence Jewry, with St. Michael Bassishaw. The church was restored forty years ago, and in 1898 was repaired and redecorated from the designs and under the superintendence of Mr. Lewis E. G. Collins, who re-instated three pairs of old oak doors which had been concealed under a deal casing, and in which a large number of leaden bullets were found to be embedded. After the Great Fire the church was rebuilt in 1677 by Sir Christopher Wren, at a cost of 5,237*l.* 3*s* 6d., in Aldermanbury, where the aldermen formerly had their Court Hall cited by Stow—a circumstance that may have given a name to the street; that derivation, however, is not beyond dispute. Between 1331 and the Dissolution the church appertained to the Elsing Hospital, also of the same dedication, by London Wall. The former edifice, partly rebuilt by Sir William Eastfield in the beginning of the XVth century had a cloister around the graveyard. Wren's church, constructed of stone, is 72 ft. long, 45 ft. wide, and 38 ft. high, as we read in the "Parentalia." Composite columns, having six intercolumniations, separate the aisles from the nave, which has a ceiling of the barrel-vault type, containing two semi-circular windows, with arch ribs and modelled plasterwork; the main cornice extends down each side of the nave at the springing of the vaulting immediately over the columns. The east end has a high rounded window and a middle cornice with an angle pediment. The tower, having raised coigns (as has the body of the church) and large belfry openings, carries a bold cornice and a partly open balustrade with pinnacles at the angles, from within which rises a square lantern. In the lower stage of the lantern are the clock and dials. The upper stage is pierced with round-headed and railed openings, and is surmounted by a concaved roof rising to a point, on which stands the vane. About eighty years ago the windows of the whole church were filled with heavy Lombardesque tracery, which has an ill-effect. In the course of some repairs was found, near the communion-table, the coffin, bearing his name, of Lord Chancellor Jeffreys, which had been taken thither from St. Peter's-in-the-Tower three years after his death and laid near the remains of his only son, Lord Wem. We may mention the burial in the church of two parishioners, Henry Condell and John Heminge, Shakespeare's fellow players, whom the poet did not forget when making his will, and to whom we owe the first collection of his plays, published by them in the folio of 1623. A monument to their memory erected in the churchyard in July, 1897, by Mr. C. C. Walker, of Lilleshall Old Hall, Shropshire, is of polished red Aberdeen granite, and carries a bust of Shakespeare modelled in bronze by Mr. C. J. Allen from that in Stratford-on-Avon church and the Droeshout portrait. The monument in the church, with busts of Richard Chandler (1691) and his brother John (1686), bears the crest of a pelican on her nest—a device carved in stone also on the front of a house in Aldermanbury, which Archer in his "Vestiges of London" says was occupied by them. Wren's church of St. Michael Bassishaw, was dismantled in October, 1899; the benefice is united to that of the neighbouring church of St. Lawrence Jewry.

SESSIONS HALL, PRESTON.—The new sessions hall at Preston is now nearing completion. The new building is erected in Longridge stone, so far as the external masonry is concerned, and the main entrance is in Harris-street. Above the doorway rises a tower to the height of 165 ft. The building consists of two courthouses, 49 ft. by 39 ft., with accessory chambers and an assembly hall. The stonework has been executed by Mr. David Tullis and Sons, the woodwork has been carried out by Mr. T. Cottam, and the ornamental metal work is by Mr. Omar R. Albrow, of Wandsworth-common, S.W., who also supplied the electric light fittings. Artificial light in the courts will be supplied by eight electroliers, each carrying seven lights. The cost is estimated at 90,000*l.*, and the building has been erected from the designs of Mr. Littler, in the English Renaissance style.

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THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A MIDLAND Counties District Meeting of the members of the Association of Municipal and County Engineers was held at Buxton on Friday and Saturday, May 20 and 21. Mr. W. Weaver, C.E., of Kensington, occupied the chair, and there were present Messrs. J. Lemon, Southampton; J. T. Eayers, Birmingham; T. H. Yabbicom, Bristol; W. N. Blair, St. Pancras; J. P. Norrington, London; J. Price, Birmingham; C. Jones, Ealing; W. H. Dorman, Armagh; H. Richardson, Handsworth; C. Lowe, Hampstead; T. Cole, Westminster, secretary; G. W. Lacey, Oswestry; W. H. Grieves, Buxton; A. W. Greatorex, West Bromwich, and others.

Captain Brown, chairman of the Urban District Council, offered the delegates a hearty welcome to Buxton. There were many things in the neighbourhood which would be of great interest to them as engineers.

The President thanked the Chairman for the cordial reception given to the Association.

Mr. A. E. Davis, Shrewsbury, proposed the re-election of Mr. Richardson, of Handsworth, as honorary secretary for the Midland district.

Mr. Grieves, Buxton, seconded, and it was unanimously carried.

Mr. Richardson briefly acknowledged his re-election.

Municipal Works of Buxton.

Mr. W. H. Grieves, Surveyor to the Urban District Council, read a paper on the Municipal Works of Buxton. He said for a small town Buxton, with its tract of elevated hills and moorland, its beautiful gardens, its stone-built public and private buildings dotted here and there on the sloping hills, was certainly one of the most picturesque, as well as one of the most fashionable resorts in the United Kingdom. It was in 1859 that out of portions of the three townships of Buxton, Fairfield and Hartington Upper Quarter, the local board district was originally formed under the Local Government Act of 1858. The district had an area of 1,275 acres, with a rateable value of over 90,000*l*., having during the last ten years increased by over 35,000*l*. The population was estimated at 11,500, having almost doubled itself since 1881. The estimated season population was from 15,000 to 20,000. The death-rate, according to the latest report of Dr. Turner, the medical officer of health, was 11·090 from all causes, including the visiting population, but with a corrected death rate of 9·727 as fairly chargeable against the normal population. The birth-rate last year was 21·5 per 1,000. The general district rate was 3s. in the *l*., including 1d. for free library. The water rate was 1s. in the *l*., having a year ago been increased 2d. in the *l*., and the poor-rate was 2*s*. in the *l*. There were about 1,900 houses in the district.

Since the town became a local governing body, and more so since it succeeded to the more dignified title of Urban District Council, the members of which had always been animated with the desire to make the town more popular and attractive, Buxton had rapidly increased in population and rateable value, so much so that people were agreed that it ought to possess a charter of incorporation of its own. This might have been the case but for the fact that the neighbouring urban district of Fairfield, which was for all practical purposes part of Buxton, being dependent on Buxton for its gas supply, for the treatment of part of its sewage, and partly for its water supply, did not yet see eye to eye with the Buxton Council, it being generally admitted that when application for such a charter was made it should be made with the idea of the two councils becoming one and making the application together.

The Council possessed its own waterworks, its own gasworks, and its own electricity undertaking; the policy of the Council being, that if there was any benefit to be derived from these and other undertakings the ratepayers at large should have the benefit. At the present time the Council were promoting a Bill in Parliament to purchase from the Duke of Devonshire the famous thermal baths and waters, the purchase price being 25,000*l*. and 1,000*l*. per annum perpetual chief rent. If the Bill was obtained, this would add yet another profitable undertaking to the Council's possessions. The average number of bathers for the last twenty years exceeded 62,000 per annum. The pump-room was erected and presented to the town in 1894 by the Duke of Devonshire. The uniform temperature of the natural mineral water, which was the same as that supplied to the baths, was 82 deg. Fahrenheit. The yield of the springs was about 120,000 gallons per day. It was estimated that over one million glasses of these warm waters were drunk every year. Another public building is the town hall, which was built in 1877 at a cost of 10,000*l*.

The gardens, which are considered to be the most beautiful in the country, belong to the Buxton Gardens Company. A few months ago a gentleman residing in Buxton handed over to the trustees the sum of 10,000*l*. for providing twelve homes for aged people. The Duke of Devonshire has given the necessary land for the homes, which are to be called the "Milnthorpe Homes," after the generous donor.

There were 20 miles of roads repairable by the inhabitants, and just over 3 miles of main roads, towards the repair and maintenance of which the County Council contribute. The carriageways for the most part were macadamised with the local limestone. Other carriageways were repaired with tarred stone by the Council's men out of the local limestone, but these were not satisfactory where there was very heavy traffic. The success of a tar-macadam road depended on a number of points which require careful watching. First, the stone must be perfectly clean and dry; second, the boiling of the admixture to the proper consistency so that it should be neither too brittle nor too soft; then it was better for it to lie in the shed a few weeks before being laid down. It required experienced men to lay it down. The method adopted by the author in making a tar-macadam road was when the foundation had been prepared to put down a 3 in. layer of 1½ in. mesh-stone, then roll carefully with the steam-roller; then spread a 2-in. layer of ¾ in. mesh of gravel, and roll as before; and finally cover interstices with ¼ in. fine gravel, and roll again. It was difficult, in this country, at any rate, to have just the weather best suited for laying asphalt. It was no use laying it in wet weather, in cold weather the stuff could not be spread satisfactorily unless it was heated, and in very hot sun it is just the reverse, so that a good deal depended on the weather. A very important question for the making-up or repairing of a tar-stone road, and one upon which the life of the road, to a very great extent depended, was that of the diversion of traffic during such making-up of repairs. The author was confident that unless traffic was completely diverted and kept off a week or two, a successful road could not be made. Nothing was more harmful to such a road than in wet weather traffic carrying dirt and mud from a macadamised road on to a newly-made asphalt road, for thus the dirt and mud worked into the asphalt takes out the very nature of it, and the road, sooner or later, would perish. The average cost of making-up an asphalt road was from 1s. 9d. to 2s. per square yard, whilst to repair a similar road cost about 1s. per square yard. Originally the footpaths were all gravelled, except in the centre of the town, where they were flagged. Now all footpaths were made of tar-stone, and application had been made to sanction a loan to complete the conversion of the footpaths to asphalt. The cost of the footpaths varied from 1s. 6d. to 2s. per square yard, according to the distance the material had to be carted. If an asphalt footpath has not worn very much, a system of veneering with hot tar and dust which was adopted by the author five or six years ago answers very well. It costs very little, but is a great saving to the footpath.

In reference to flagged footpaths, in April, 1898, the author had laid on the footpath at the top of the Terrace-road, forty-six square yards of concrete flags, made from the limestone, gravel, and cement, as an experiment. Although six years had passed, the flags seem to be none the worse. Since then these flags had been adopted on some of the more important footpaths of the town. The Duke of Devonshire had them laid in front of the hot baths, and the Gardens Company in front of the gardens, These flags possess many advantages over the ordinary York flag. They get a much more even surface, a footpath with a much more pleasing appearance, not at all slippery, which quickly dries after rain, and, above all, was very much cheaper. The method of mixing and making was all by hand. It was made of three, four, or five parts of limestone, gravel, and dust, according to the purpose for which it was to be used, and one of Earl's cement. The concrete was thus moulded in frames specially made and clipped with iron bands. These stood in the shed another day drying, when the bands were removed, and the frames taken away, and the third day the article was ready for removal, and was at once stacked out in the weather. The longer the material was weathered, the better it would stand when fixed in position. Owing to the soft nature of the limestone of which the roads were constructed, they required a good deal of attention at all seasons of the year, for in summer they were very dusty, and in wet weather dirty, so that the scraper and horse-brush are pretty much in evidence. It would, therefore, not surprise the members to know that the Council had adopted a suggestion to try the new disinfectant dust layer "Westrumite." Two tons of the liquid had already been purchased, and the members would have an opportunity of seeing some of the roads which had been treated with "Westrumite." The author hoped for his own comfort, as well as for the general benefit of the community, that it would be a great success.

As the Duke of Devonshire was the ground landlord, it was seldom necessary to make private roads up under the Public Health Act, 1875. Generally speaking, private roads were made under an arrangement with the Duke's agent, and in all cases the Council carried out the work, charging the cost to the Duke. Three of such roads were now under construction. Owing to a dispute which arose on the question of water rights between the council and the Duke of Devonshire, and which lasted for a period of about four years, no land whatever was sold by him during that period, and therefore new roads had not been so much needed. New buildings had not gone up, as they otherwise would have done, in consequence. The result of the dispute was that in 1902 the Council obtained an Act of Parliament giving authority to spend the sum of 170,000*l*. in new waterworks. In this Act the Council had some very important sanitary clauses inserted. Perhaps the most important section was that where the Council might order houses, etc., to be drained by a combined operation without necessarily becoming a sewer. The author was of the opinion that the section referred to would remove, as far as Buxton is concerned, any difficulty which might crop up in the future as to the question of liability by owners in respect to the maintenance and repair of drains to houses built after the passing of the Buxton Urban District Council Act, 1902. It would be remembered that section 19 of the Public Health Act (Amendment Act, 1890) provided that where two or more houses belonging to "different owners" were connected with a public sewer by a single private drain, the local authority might in the case of defective drainage require the owner or occupier to remedy the same, or, in default, do the work themselves, and recover the expenses incurred, etc. The assumption was that if the same drain under exactly similar conditions drained two or more houses belonging to the "same" owner, then the local authority could not require the owner or occupier to remedy the same, but would be obliged to do the work themselves. The position was absurd. The sewerage system of the town was designed by the late Sir Robert Rawlinson in 1860, and had recently been extended at the rate of 1,000 yards per annum. The sewers, of which there were over 36 miles, vary from 36 in. near the outfall to 9 in. in the upper parts of the district. Originally all surface water was passed into the sewers. The reason was obvious, as in 1871 the population was 3,717, and then there were no water-closets or baths. Now there were 3,500 water-closets and over 800 baths. The sewers were laid in open joints, and had very little work to do, and consequently in various parts of the town connections were made from the river to the sewers, in order that during the time of floods these river "storm overflows" would come into action, and the sewers would then get the necessary flushing. Of course, owing to the increase of population, water-closets, baths, etc., these connections consequent upon the increased flow of sewage had given a great deal of trouble, and most of them—where discovered—had been stopped up. In 1900 alone 250,000 gallons per day of surface and spring water were diverted from the sewers into the river; and, as circumstances permitted, this work was carried on, and the separate system was gradually being adopted. The dry weather flow at present was 1,000,000 gallons per day. From a detritus tank the sewage passed into three existing cage-pits, and in these were two additional ones provided in the new scheme, where the solids, such as rags, orange-peel, etc., were arrested

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and emptied daily into a pit, from which they were carted away to the farms. After passing the cages the sewage, which was treated by chemical precipitation, was mixed with the precipitant, which was composed of—(*a*) Natural iron water, which flowed to the works by gravitation from a disused colliery-heading three miles away. This water contained six to seven grains per gallon of iron and an appreciable quantity of sulphate of alumina. In Dr. Thresh's opinion this iron water was more effective than any artificial precipitant he knows. (*b*) Milk of lime. The lime was delivered on the works in lump, and was obtained from the Lime Firms Company, not far from the works. The proportion was about 60 grains of lime to the gallon of iron water, and the whole was mixed with five or six times its volume of sewage. This was then agitated by two small water-wheels driven by the sewage itself, and then passed into the settling or precipitating tanks. These tanks were three in number, and were 260 ft. long by 75 ft. wide. At the outer end they were 5 ft. deep, and at the inlet 7 ft.; and were sub-divided by cross walls, which alternately allowed the sewage to pass under and over the same, thus giving the precipitant time to deposit the solids in suspension to the bottom of the tanks. They had a total capacity of 770,000 gallons, and were made to work in duplicate, whilst the third alternately was being cleaned out. The sludge gravitated to a well at the inner end, and was lifted by a centrifugal pump into a sludge tank at the back of the press room. This tank had a capacity of 12½ cubic yards. The sludge is pressed into cake by two of Johnson's air compressors. The cake possessed good fertilising qualities for growing grass, etc. No charge was made for the sludge cake, and farmers took it away; and the Council use the remainder on their farm of 40 acres, which farm was used for producing the hay required for the horses, and also for turning out the horses in the summer-time.

The sewage, after having been treated in the way described, then flows out of the tanks over a sill, and in this way had produced a most satisfactory effluent—as far as precipitation effluents go—for upwards of sixteen years. But even this effluent did not satisfy the Council, as in a dry summer, owing to the river rising just above the town, sometimes nothing but the sewage effluent is passing down the river; and although the effluent might be good enough to turn into any stream, yet it was not satisfactory to leave a stream composed of sewage effluent only. Therefore, after much experimenting with various kinds of filters, the Council received the sanction of the Local Government Board to construct new filter beds, and the contract was let to Mr. J. S. Dawson, Assoc.M.Inst.C.E., of Blackpool, chief assistant to the surveyor, who acted as resident engineer.

Three clarifiers, or intermittent streaming filters, had been constructed on land immediately below the precipitating tanks, and which was already in the possession of the Council. These beds had an aggregate depth of about 5 ft., with an area of about 1,000 square yards. Through these the tank effluent would pass before sending it down to the filters. They were so arranged that they could be worked either upward or downward at will. The beds, underdrained, were composed of larger media than the filter-beds below. The sewage would be distributed over the clarifiers by means of wooden troughs, and pass out either over the sill at the bottom or through the penstock. The sewage from the precipitating tanks and clarifiers was delivered at the new works into a feed-channel, at a level of 870·42 above Ordnance datum, 4 ft. 6 in. wide and 18 in. deep. This channel was controlled by penstocks, so that any part of the filters could be working or resting at will. The concrete floors were 9 in. thick, worked up to a smooth surface, with a fall from each division wall to the centre, and from the inlet side to the outlet. From the centre of each bed a 12-in. pipe communicated with the effluent channel.

The question of distribution of the sewage over the filters was not lost sight of; and the Council, after visiting several places where automatic distributors were at work, decided in favour of Adam's patent Cresset revolving distributors, which are driven automatically by the head of liquid in the feed-channel.

So far the filtering media had been obtained from the Council destructor works, and also some hundreds of tons were purchased from outside the district; the clinker was first put in the bed and gradually reduced in size till the top layer, of a depth of 6 in. to 9 in., was composed of the ½-in. ashes. The total depth of the bed was 4 ft. 6 in. The increased depth would be completed as the clinker is produced at the destructor. From the purchase by the town of the waterworks, in 1874, the position of the water supply remained somewhat stationary until the year 1886, when the Lightwood reservoir was enlarged. Then the total holding capacity of the various reservoirs, viz., Lightwood, Cold Springs, Burbage and Watford, was 8½ million gallons. In 1892 the Council realised the necessity of still further increasing the storage capacity, and constructed a new reservoir at Burbage, which increased the storage capacity by 15 million gallons. The collecting area, which rises above the reservoirs from 1,230 to 1,800 feet above sea level, was a tract of moorland and wooded country over four miles long and half a mile wide, and had an area of about 1,900 acres. This area was absolutely free from population and cultivation. The reservoirs were all within two miles of the town.

The Council obtained an Act of Parliament in 1902, sanctioning the construction of a new reservoir, with a storage capacity of 80 million gallons, and aqueducts for conveying the water to the reservoir. The estimated cost, including lands and casements, etc., was 170,000*l*. The contract for the reservoir, which was being constructed from the designs of Messrs. G. N. Hill and Sons, was, in December last, let to Messrs. Fisher and Le Fann, of Belfast.

The consumption of water in Buxton was greatly in excess of towns of similar size, owing to the large number of water-closets, baths, carriages, char-a-bancs, etc., and the supply to the railway companies. The consumption per head reached nearly 40 gallons, which was often exceeded in the summer time. The by-laws in force were adopted eighteen years ago, and based on the model by-laws of the Local Government Board. Those relating to the disconnexion and ventilation of the drains were only put in force some seven years ago; up to then the custom was to allow the sewers, in addition to the open manhole system, to ventilate themselves through the ventilating shafts erected on private drains. At first the builders did not take kindly to the change, but so far from any difficulty arising, they had in many cases provided themselves with the necessary stoppers for testing, so that it is far less trouble for the surveyor to test the drains than formerly. In the case of new buildings, the whole of the drainage was hydraulically tested before being covered up.

A two-cell destructor was erected in 1886, at a cost of 1,836*l*. (exclusive of site), of the Manlove, Alliott and Frye type. The cost of collecting the refuse was 2s. 3d. per ton, and the cost of burning the same, including repairs to the cells, etc., was 11d. per ton.

Mr. J. Price, Birmingham, proposed a vote of thanks to Mr. Grieves for his paper. After using cement for twenty-five years he had come to the conclusion that it was one of the most fickle subjects they had to deal with; unless the greatest precautions were taken with the cement which the manufacturer delivered on to their premises, the results were not such as they would like. He had some cement which passed every possible test and yet absolutely failed. It passed the test for fineness, for tensile strain, and for slowly setting, yet that cement in many cases cracked to such an extent that they had to discontinue the use of it.

Mr. MacBrair, Lincoln, seconded the vote of thanks. It seemed to him they had a very extensive process of sewage disposal. In these days they thought if they had an effluent which went through one or two contact beds they had one good enough to go anywhere.

Mr. C. Jones, Ealing, pointed out that the position of Buxton as a health-resort was different from most towns, and they had not to consider the expense, but the good name and character of the town.

Mr. Lacey, Oswestry, congratulated the town on possessing the waterworks, gasworks, and electrical undertaking.

Mr. Greatorex, West Bromwich, thought a better stone should be used on the more important thoroughfares. The advantages would more than outbalance the disadvantage of cost. To have the streets constantly torn up was a matter of annoyance to shopkeepers and visitors.

Mr. Price, Lytham, said he envied Buxton the power it had to deal with combined drainage. The previous week his Council had a Bill in Parliament, and one of the clauses was to get similar power, but their agent told them it was no use attempting to override the public law by a private Act.

Mr. Cox, Manchester, Mr. Taylor, Newcastle, and others, having contributed to the discussion, the vote of thanks was unanimously passed.

The members were entertained to luncheon; and the afternoon was devoted to visits to the electricity works, and the bacteria filter beds.

On Saturday further visits were made to the Dorlow Lime and Stone Company's works at Hindlow, Mr. A. W. Spencer's new lime works, and the works and Hoffman kiln of the Buxton Lime Firms Company.

On Monday an excursion was arranged to Chatsworth House and Haddon Hall.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

I.—MOOR PARK, RICKMANSWORTH.

THE current series of summer visits commenced on Saturday, the 14th inst., when, in fine weather, a body of some thirty-five members assembled at Moor Park, Rickmansworth, with the object of studying this well-known classic house. Under the guidance of Mr. H. B. Couchman, agent to the estate, the gardens, tea-house and lodge, standing on the north side of the Watford-road skirting the park, were first visited. These are early XVIIIth century brick buildings, very interesting in themselves, and are the only remaining parts belonging to a larger dwelling, now destroyed, known as Hampton House. The lodge sets back from the road about 20 ft., and the massive garden walls are built to form a semi-circular forecourt which is laid out in two grass plots. The effect is attractive, and one which might be more often attempted in present-day work. Behind this building is the tea room—a kind of garden house, octagonal in form with plaster-vaulted ceiling enriched in the Adam manner. Entering the park, which is here bordered by a famous avenue of limes, the site of a historic moated house was pointed out, in which, with much other tradition, Cardinal Wolsey is said to have lived and entertained his King on a scale of some magnificence.

The present house was built originally of brick, about 1685, by the Duke of Monmouth, after purchasing the estate, and was encased in Portland stone in 1720 by a succeeding owner, who added the portico on the north front; for this later work an Italian architect, Giacomo Leoni, was employed. The transformation cannot be said to be successful from all points of view, although a sense of dignity is present. A large Corinthian order, embracing three floors, is applied, with columns and pilasters standing upon pedestals, and the heavy entablature is lavishly carved in orthodox detail, giving the impression of an overpowering effect on the other features, which indicate an idea of the true scale of the house. One result of the use of the order is the distortion of the ground floor and top floor windows. The portico is of such great height that no directly useful purpose is served by its introduction. This dressing of the fronts was the outcome of the ostentatious fashion of the day.

The plan of the house is typical of the period; high, rectangular rooms placed on the four fronts, with the principal ground floor apartments arranged intercommunicating, whilst two top-lighted staircases occupy positions unsuited to any other practical purpose. A large hall is entered from the portico, giving access—through five marble doorways—to some of the principal rooms and to the staircases. This is a very lofty apartment with a gallery carried all round on corbels at the top floor level. A plain marble floor laid in large squares is quite pleasing, while the walls have large panels containing painted allegorical subjects by Amiconi. The ceiling is also painted, and is a representation of a dome in perspective, but the illusion is hardly successful.

The employment of foreign skill at this period of great building activity in England is instructive from many points of view; there was talent enough of a native kind, and a fashionable painter was Sir James Thornhill, but his efforts in the large painted subjects in the saloon at Moor Park are disappointing. This is in a great measure due to the absence

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of frames or other similar methods of setting, which works of this kind require.

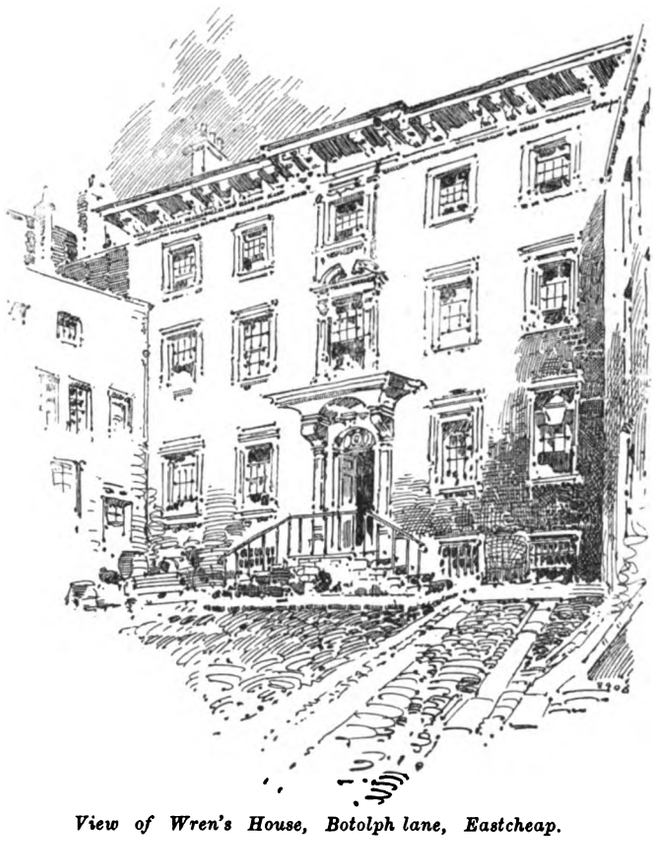
The ceilings of the principal rooms are coved and elaborately modelled in plaster; that in the dining-room—an unusually narrow chamber—is covered with painted decoration which is said to be the work of Cipriani and Angelica Kaufmann. Many excellent marble mantelpieces are to be seen; an especially good one is also in the dining-room, the interesting feature of which is a frieze designed as a procession of graceful female figures.

On the north front is a so-called Italian garden and terrace, falling very slightly from the house, and enclosed by low stone walls. Flower beds having box borders are laid out in a formal manner with large standard yews at intervals, and at the time of the visit the whole garden was a glorious mass of wall flower, in about four varieties, in full bloom, the fragrance of which will ever be remembered. This broad use of a single early flower is to be commended in preference to the lavish variety so usually resorted to in the arrangement of early flowers in formal gardens.

A classic pleasure garden situated on high ground, with a circular fish pond, stone temple, and stepped approach, was also inspected; and lastly, the kitchen gardens, with various interesting forms of standard fruit trees, amongst other sights, concluded an enjoyable and, withal, profitable afternoon's excursion.

"WREN'S HOUSE."

THIS XVIIth century house, which during some years past has served for the Billingsgate, Tower, Dowgate, Bridge, and Candlewick Ward Schools, is one of the four or five in London which, it is said, were inhabited by Sir Christopher Wren when occupied, as Surveyor-General, in rebuilding churches and other edifices after the Great Fire. That tradition apart, the house presents many features of unusual interest as an example of a residence in the City in olden times. It has a large paved forecourt, which is entered through Fenn's gateway at No. 32, Botolph-lane, Eastcheap; the rear abuts upon the sinuous foot-thoroughfare of Love-lane. The west front of the house, which is of red brick, has a deep cornice carried upon consoles, and on that side the flat roof is without a parapet. Some of the stucco-work is modern; the brick-work of the dog-kennel beneath the front steps is now covered with cement. The interior has been re-arranged for school purposes; the two spacious landings on the principal staircase are absorbed into the class-rooms, and their ornamental ceilings are cut by the partitions. There is a second staircase in the north part of the house; one or two rooms on that side have what were, apparently, powdering-closets. The parlour on the entrance floor has a moulded ceiling decorated with foliage; the panels are painted with figures and other subjects discernible only on a sunny afternoon; on one of the panels is painted:—"R. Robinson, 1696." In the plaster ceiling of the main staircase is moulded "1670." The large room on the first floor contains a fine chimney-piece, of white and inlaid coloured marble, most delicately carved, and after the Adam style; two fluted pilasters, having foliated and flattened capitals, support a frieze ornamented with rosettes in circular inlays; in the middle is a panel with a recumbent figure in high relief, at the ends are wreathed vases in low relief. A room above was the laundry; the old ironing fireplace is boarded up. The doorways of the principal rooms have massive jambs and curved pediments; the carved stair-rails and posts, and the joinery generally, are of a good and substantial character. We are informed that the house will be vacated at no distant date, upon the removal of the schools into new buildings in connexion with the Sir John Cass Foundation in Jewry-street, Aldgate. We may add that Mrs. Riddell introduces it into her novel, "Mitre-court," the story of which is laid in the city.



View of Wren's House, Botolph lane, Eastcheap.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—On the evening of April 26 the Manchester Society of Architects began their summer programme by a visit to the new transit sheds for the Ship Canal. The sheds are constructed entirely of ferro-concrete, on the Hennebique system, the roofs being covered with Limmer asphalte. Mr. Williams, the resident engineer, showed the visitors through sheds in various stages of erection, and the visit was an instructive one. The next visit, on May 17, dealt with a very different branch of an architect's work, the members visiting the works of the Pilkington Tile Company at Clifton Junction. Such works, seen under the guidance of such an enthusiast as Mr. Burton, the manager, show one something of the wonderful fascination of the potter's craft, and explanations of the various processes, from the raw clay to the very beautiful finished tile or pottery, were listened to with the keenest interest.—The fortieth annual report of the Society shows that it now has a total of 207 members, viz., 103 Fellows, fifty-one Associates, and fifty-three students. The total number when the last report was issued was 193, showing an increase of fourteen in the year. In accordance with some new regulations on the subject of alliance with the other societies, recently passed by the Manchester Society, the Blackpool and Fylde Architectural Association have applied for and been admitted into alliance. In the course of the Report it is stated that the thanks of the Society are due to Mr. A. E. Corbett for the work he has undertaken for the publication of a map of buildings of architectural interest in the neighbourhood. The first proof of this map will shortly be published and distributed to architects and others who may be interested, and who may be willing to give their services in editing and revising any section with which they may be familiar. By this means it is hoped that a most valuable map may be obtained which will be a guide to the antiquary and a help to the architectural student in search of subjects for study.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held at the rooms in Sackville-street, on the 18th inst., at 8 p.m. Mr. C. H. Compton, Vice-President, in the chair. A paper was read by Mr. R. H. Forster, on "Durham and Other North Country Sanctuaries." He said distinction must be drawn between taking sanctuary in an ordinary church and in certain churches specially privileged. In the former case the culprit had to abjure the realm, in the latter he obtained permanent protection; there were about thirty churches so privileged in England; those of the north being Durham, Tynemouth, Hexham, York, Ripon, Beverley and Wetheral. The origin of their privileges was obscure, and in early times their rights were, probably, more limited, but would be increased by the reputation of the local saint, which resulted in a grant of *jura regalia*, and royal officials could not follow offenders into liberties which possessed such semi-independence. In 1342 Beverley, Ripon, Tynemouth, Hexham and Wetheral had permanent grithmen or sanctuary men, who were offered free pardons if they would enlist under Edward de Baliol for service in Scotland; Durham was probably in the same condition, but the Bishop had his own forces to provide for. Anciently many sanctuaries extended from the church for a mile in every direction, but later the protected area was that subject to the *jura regalia*, which in the case of Durham extended over the whole county. The privileges of Durham are said to have been granted by Guthred the Danish King, in 883, and to have been confirmed by Alfred; they gave sanctuary for thirty-seven days, but as the power of the bishops increased, this period was extended; there is no direct evidence of the process, which must be inferred from what we find existing at the beginning of the XVIth. century. The formalities of taking sanctuary may be gathered from the "Rites of Durham," and the Cathedral registers, and the number of admissions during the fifty years for which entries are extant, averaged under six a year. The "Rites of Durham" says that the grithman was conveyed out of the diocese, but this is not supported by the registers, which are better evidence, the "Rites" being of doubtful value on this point. Expressions in the registers, especially "libertas infra Tynam et Tysam," tend to show that the grithman could live anywhere in the county; we find men coming to Durham from other sanctuaries, and there are two cases of grithmen living in the bishopric years after their admission. Out of 240 recorded cases all but two come from outside the county. Crime committed within a sanctuary could not be protected at that sanctuary, and a criminal of county Durham could not take sanctuary at Durham; the real sanctuary area was the county itself. The reputation of St. Cuthbert and the power of the mediæval bishops preclude the supposition that Durham had lower privileges than are known to have been possessed by other sanctuaries.—A second paper was read by the Chairman, on the question, "Can Votive Offerings be the Subject of Treasure Trove?" supplementary to his previous paper, read on December 16 last, upon the recent decision of Mr. Justice Farwell, that the "finds" at Lough Foyle were treasure trove, and belonged to the Crown as such. The defence in that case was that the articles found were votive

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offerings to a river god, and did not, therefore, come within the definition of treasure trove; the contention for the Crown being that even if they were votive offerings, they would come within that definition. The learned judge's decision was founded on other grounds, and this question was, therefore, left undecided. After explaining the nature and object of votive offerings, and referring to the rule that if the owner abandoned the articles in dispute the Crown's right would not attach, the reader referred to instances, ancient and modern, leading to an inference that the devotee disposed of his offering without any intention of resuming possession, which would be such an abandonment not only of the things offered, but also of the owner's right and title thereto, as would defeat this right of the Crown and vest the ownership in the finder; and this would be especially so in the case of things found in tombs intended for the use of the deceased in his future existence, which were not concealed *animo revocandi*, but deposited as the property of the deceased, or an absolute and irrevocable gift to him. The practice of the Treasury in claiming gold and silver discovered under these circumstances still awaits a judicial decision as to its validity. Time did not allow of any discussion on these two interesting papers. At the Council in the afternoon the Hon. Sec., Mr. Patrick, directed the attention of the meeting to the needless and persistent destruction by the Town Council of Berwick-on-Tweed, of the Edwardian walls of that most interesting old town, and the greatest regret was expressed that the Town Council should be so oblivious of the injury and loss they are causing, not only to Berwick, but to the whole Kingdom, by their inability to appreciate the value of the remains of the ancient glory and history of their town. Printed slips, descriptive of the present condition of the walls and towers, forwarded by Dr. King, the Vicar of St. Mary's, Berwick-on-Tweed, were circulated at the evening meeting.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held on Thursday last week, at the City Hall, Charing Cross-road.

Piccadilly Widening.—The Improvements Committee reported that they had appointed five of their members to confer with five members of the Improvements Committee of the London County Council with regard to the widening of Piccadilly, between St. James's-street and Duke-street.

Martlett-court Improvement.—The same Committee reported having again considered the following paragraph of their report of April 11 last, which was referred back to them by the Council:—"We have received a letter from Messrs. Beadel, Wood, and Co., solicitors to the Duke of Bedford, dated March 21, 1904, enclosing a plan of the proposed Martlett-court Improvement, and stating that they have now arranged to secure the freehold interests of 29, Bow-street, and are negotiating for the freehold of No. 1, Martlett-court, as well as the leasehold interests, and that, subject to a proper agreement being entered into, they are willing to advise the Duke of Bedford to agree to a scheme for the removal of Martlett-court so as to adjoin Bow-street police-court, and to throw into Bow-street certain land, provided the City Council carry out the necessary paving works and put into force the powers they possess under the Michael Angelo Taylor's Act, where applicable, or failing that, to petition the Local Government Board for a provisional order for the purpose of altering the position of the court, subject to the Duke of Bedford reimbursing the Council all moneys spent in obtaining and putting in force the above powers, as also the compensation moneys paid."

Having again considered the matter, the Committee once more recommended that the Council should accept the proposal set out in the letter, and this was agreed to.

Wardour-street Improvement.—On the recommendation of the Committee, it was agreed to call the attention of the London County Council to the fact that the pulling down of twenty-six houses in Wardour-street afforded a good opportunity for widening that thoroughfare.

Great Smith-street Improvement.—The Committee recommended, and it was agreed, that the corner of the railings at the Great Smith-street library should be rounded off.

Vincent-street Improvement.—An offer was received from the Napier Memorial Church Club to dedicate to the public a piece of land, about 530 ft. super., at the corner of Vincent-street and Hide-place, by which the street could be inclined at a very narrow part. The offer was conditional on the Council making good the pavement around the site without charge. On the recommendation of the Committee it was agreed to accept the offer and to execute the paving works at an estimated cost of 130*l.*

The Valuation Bill.—The Law and Parliamentary Committee reported having considered this Bill. They were of opinion that, although some minor amendments tending to promote further uniformity of assessment might, with advantage, be made in the existing law as regards London, the present Bill, in its application to the metropolis, was quite unnecessary, and would, if passed into law, add considerably to the cost of administration with practically no compensating advantages. The Committee recommended:—(*a*) That the Council do express the opinion that, with a view to promoting uniformity of assessment in London, a clause should be inserted in the Bill empowering the London County Council to delegate a representative to attend the meetings of the existing Valuation and Assessment Committees, and to object to any assessment, and, if necessary, to appeal to Quarter Sessions, but that in all other respects the Bill should not apply to London.

(*b*) That a petition under the Common Seal of the Council be presented against the Bill.

The recommendations were agreed to.

The Committee reported the receipt of a number of communications from Borough Councils with regard to the Bill.

Sanitary Institute Congress.—On the recommendation of the Public Health Committee Councillor N. G. Thomas was appointed a delegate to the Sanitary Institute Congress, to be held this year at Glasgow.

Lamps, Signs, etc., Authority for Sanctioning.—The Works Committee reported that the Mayor, two members of the Council, the Town Clerk, and the City Engineer attended before the Building Act Committee of the London County Council on the 2nd inst. to discuss the question of the jurisdiction of the London County Council and the City Council with regard to the regulation of lamps, signs, and other structures overhanging the public way. They were informed that the London County Council were in communication with the Local Government Board on the subject, and it was suggested that, as the City Council were in favour of making by-laws, it would facilitate matters if the City Council would also communicate with the Board.

The Committee reported that the Town Clerk had been instructed accordingly.

Sewer Reconstruction.—On the recommendation of the Works Committee it was agreed to reconstruct the sewer in Regent-street, between Nos. 93 and 113, at an estimated cost of 250*l.*; and to substitute a 9-in. and 12-in. pipe sewer for the existing brick sewer in Green-street, at an estimated cost of 350*l.*

Lighting of Aldwych.—The Committee reported having considered tenders for the lighting of Aldwych. The specification prepared by the City Engineer was as follows:—For the provision and fixing of about sixteen columns, bases, lanterns, burners, and other fittings; for the light to be 20 ft. above ground; for each lamp to give a minimum 700 candle-power, and to burn 3,940 hours per annum; for the maintenance for five years, and annual painting during that period, of each lamp; for the cost of the initial installation to be payable in five equal yearly instalments, without interest.

The specification also provided by other schemes for an installation with 15 ft. standards instead of 20 ft., and for an installation with telescopic standards, movable between 15 ft. and 20 ft. The Committee considered that, for a street of the width of Aldwych, the public lamp standards should be 20 ft. in height. They were also of opinion that a telescopic standard would be a source of danger, especially in connexion with a gas lamp, and for those reasons did not recommend the acceptance of quotations on either of those schemes. Of the tenders submitted that of the Gas Light and Coke Company was the cheapest; 20*l.* per lamp for installation, to be paid in five annual instalments, and 15*l.* 10s. 5d. per lamp per annum, cost of maintenance and lighting, including gas or electricity. The company pointed out that they were unable to agree to the clause as to the payment and observance of rates of wages and hours of labour recognised by the association of employers and employees, although they believed their rates of pay were no lower than union rates. The Committee recommended that the tender of the Gas Light and Coke Company be accepted, subject to the conditions attaching to the tender, except the condition referring to rates of pay and hours of labour. After some discussion the matter was referred back to the Committee for further consideration.

COURT OF COMMON COUNCIL.

THE usual fortnightly Court of Common Council was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

The Improvements and Finance Committee submitted a report relative to the arrangement, agreed to in July, 1899, for widening the western end of Fleet-lane, Farringdon-street, which involved the absorption of Newcourt. The Committee reported that, as the magistrates did not see their way to make the necessary order for the closing of the court, the improvement had been abandoned.

A report was received from the Streets Committee relative to the suggested appointment of a Select Committee of the House of Commons to consider the whole question of the means of escape from fire in factories and workshops; and recommending that the City Members of Parliament be asked to support the proposal.

Resolutions were received from various bodies urging the deletion of London from the Valuation Bill now before Parliament, and, in one case, asking the Corporation to appoint two delegates to attend a conference of Metropolitan Borough Councils, etc., at Spring-gardens, on May 27 next, at three o'clock. Mr. Pridmore and Alderman Burnett were appointed.

The Lord Mayor laid before the Court a letter from Mr. Andrew Murray, the City Surveyor, asking the Court to accept his resignation under the terms of the Corporation pension scheme. The letter was referred to a joint committee of the City Lands, the Bridge House Estates, the Improvements and Finance, and the Officers' and Clerks' Committees.

On the recommendation of the Coal and Corn and Finance Committee, it was agreed to undertake a systematic re-wiring of the Guildhall. The work will commence with the Art Gallery, on which it is proposed to expend a sum not exceeding 200*l.*

NEW OFFICES OF THE HEARTS OF OAK BENEFIT SOCIETY.—The foundation-stone of the new offices for this society, which are to be erected on a site in Euston-road, was laid on the 23rd inst. The estimated cost of the new premises is 44,000*l.*, and the architects are Messrs. Essex, Nicol, and Goodman, of Birmingham. The building was illustrated in our issue for February 22, 1902.

BURY UNION HOSPITAL.—The memorial stones of this new hospital, which is being erected at Jericho, were laid on the 12th inst., as we stated last week. The new hospital scheme, for which Mr. A. Hopkinson, of Bury, is the architect, is estimated to cost 30,000*l.*, but at present the administrative block, two large pavilions, and a maternity ward, only are being built. The contract has been let to Mr. James Byrom, of Bury, for 20,699*l.* The complete scheme will provide accommodation for 201 beds, and the portion now being erected is for 126 infirm people, and seventeen nurses. As completed, the hospital will have an administrative block with storerooms in basement; nurses' dining and sitting rooms, scullery, stores, surgery and dispensary, doctor's lavatory, men and women's waiting rooms, and head nurse's office on the ground floor; probationers' sitting room, superintendent nurse's sitting room and bedroom, six nurses' bedrooms, stores, bathroom, and water-closet on the first floor; and ten bedrooms, store, bathroom, and water-closet on the second floor. There will be two large pavilions, one for men on the west side of the administrative block, and the other for women on the east side, each two stories high. Each floor will contain a large ward 91 ft. 3 in. by 24 ft. wide, and 12 ft. high, with accommodation for twenty-eight beds; day room, 16 ft. by 24 ft. at end of large ward; ward kitchen, ward for two beds, 16 ft. by 14 ft. 6 in., stores, bedroom, and water-closets. There will be a maternity ward, one story high, 28 ft. by 24 ft., for six beds, with labour ward, kitchen, stores, bathroom, and water-closet. There will be two smaller pavilions, one on the west side of large pavilions for men, and one on the east side for women. These will be two stories high, and each floor will contain a large ward, 55 ft. 3 in. by 24 ft., and 12 ft. high, with accommodation for sixteen beds; day room, 15 ft. by 24 ft., and 12 ft. high, at end of large ward; ward kitchen; a ward, 16 ft. by 14 ft. 6 in., for two beds, to men's pavilion; and a ward, 16 ft. by 19 ft. 6 in., for three beds, on the ground floor, and for four children on the first floor, to women's pavilion; stores, bathroom, and water-closet. All the floors will be fireproof, and the ward floors are to be finished with maple, polished; the kitchens are to be tiled, and the passages will be of terrazzo. The walls of the wards, etc., are to be in Keene's cement, finished with ripolin enamel paint, and the dado to kitchens and passages to be tiled.

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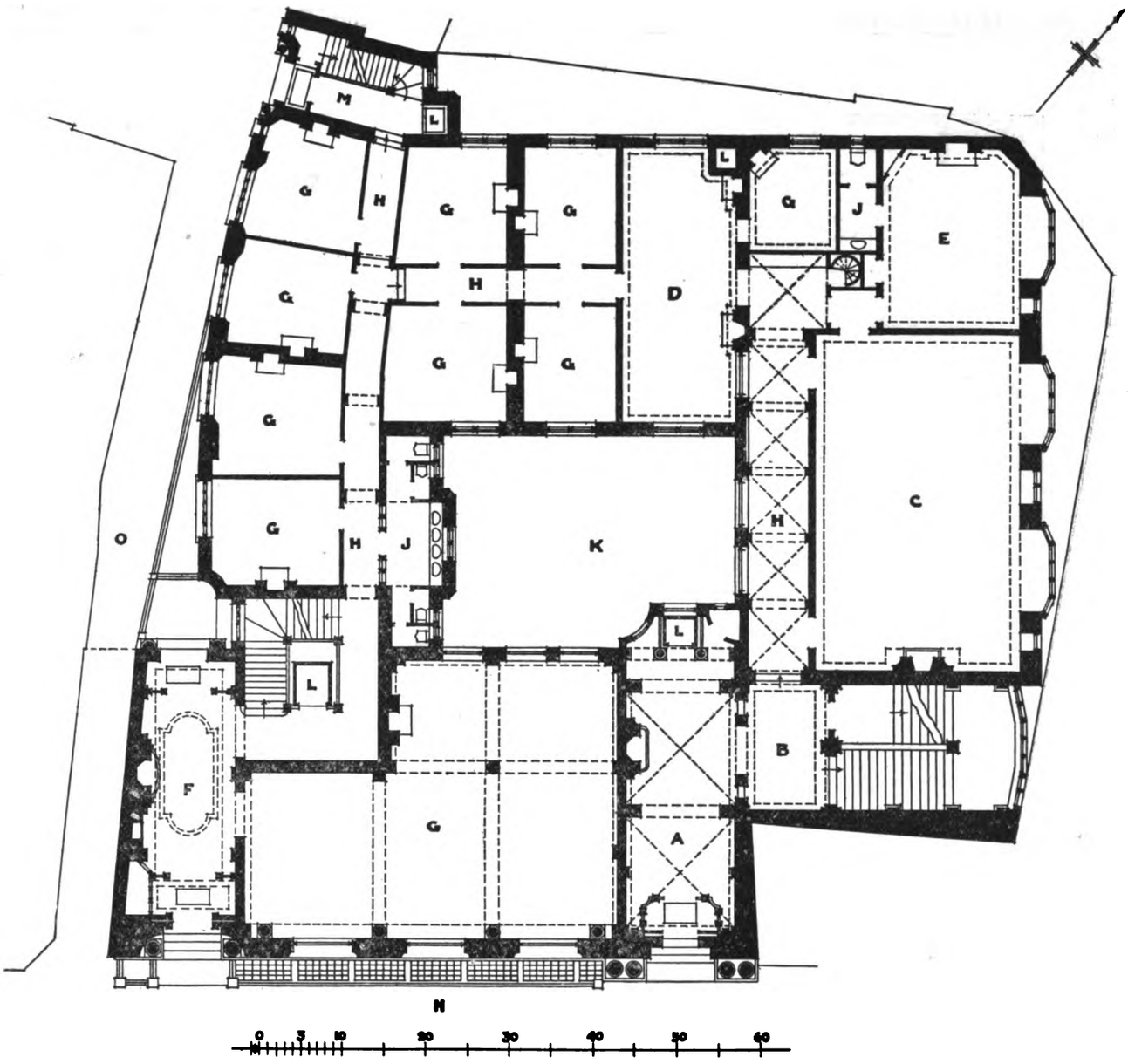

Ironmongers' Hall, Fenchurch-street; as proposed to be re-built. Plan.

A.—IRONMONGERS' ENTRANCE HALL.
B.—MAIN STAIRCASE.
C.—COURT ROOM.
D.—GENERAL OFFICE OF COMPANY.
E.—CLERKS' OFFICE.
F.—ENTRANCE TO OFFICES.
G.—OFFICE.
H.—CORRIDOR.
J.—LAVATORY.
K.—OPEN COURT.
L.—LIFT.
M.—SERVICE STAIRCASE.
N.—FENCHURCH STREET.
O.—FISHMONGER ALLEY.

Illustrations.

IRONMONGERS' HALL, FENCHURCH-STREET.

THE rebuilding scheme of the Ironmonger's Hall comprises the necessary accommodation for the Worshipful Company of Ironmongers, together with suites of offices letable to the general public.

The building has been arranged around a quadrangular central area, and is five floors in height, exclusive of the basement and mezzanine in the north-west portion of the building, between the first and second floors.

The two main entrances are on the extreme right and left of the Fenchurch-street front, and lead to the main staircases of the Ironmongers' Company and the public offices respectively.

The first floor comprises the banqueting hall (63 ft. by 33 ft.), drawing-room (33 ft. by 28 ft.), and other offices. The second floor comprises the gallery to the banqueting hall and the parlour (32 ft. by 15 ft.) and lavatory accommodation, with subsidiary open newel oak staircase. The third floor comprises the ladies' dining-room (21 ft. by 16 ft.), and the bed and dressing rooms of the officers and members of the Company. The extensive kitchen accommodation is also on this floor. In the basement are the wine cellars, plate and document rooms, lavatory and cloak rooms, etc.

A large proportion of each of these floors have office accommodation letable to the general public.

The whole of the building is well supplied with electric lifts; that at the end of the right-hand entrance hall, projecting into the central area, being a subsequent addition to the plan.

The façades to Fenchurch-street and Fishmonger-alley are in Portland stone with copper roofs over the bay windows.

Messrs. Hubbard and Moore are the architects. The drawing is exhibited at the Royal Academy.

"COOMBE FIELD," GODALMING.

THIS house was built from the designs of Mr. Gerald C. Horsley about two years ago, on the summit of Frith Hill, Godalming. It was planned with a view to economy of space and cost.

The exterior walls are of the local Bargate stone, and, owing to the exposed situation of the house, were built with an inner wall of brick and the space between was filled with "hygeian rock" composition.

The roof is of local red tiles, and the work was carried out by Mr. N. Purday, and Mr. J. Gorringe, of Farncombe, near Godalming.

NEW PUMPING STATION, CLEVEDON, SOMERSET.

THE Clevedon Water Company have recently very largely increased the scope of their undertaking under the direction of Mr. James Mansergh. The photographs we publish show the buildings of the New Pumping Station, which have been designed by and erected under the supervision of Mr. H. Dare Bryan, of Bristol. The buildings are executed in local green-grey Pennant stone with Bath stone dressings, (the roofs covered with Broseley tiles), and have been carried out by Messrs. Chancellor and Sons, of Bath, Mr. W. H. Lewis acting as clerk of works.

We may say that it was not originally intended to employ an architect, but to leave the buildings to the engineer. It was due to Sir Edmund Elton, however, the ground landlord, whose historic house, Clevedon Court, is quite close, that the exterior treatment was put into the hands of an architect.

RALSTON U. P. CHURCH, PAISLEY.

THIS shows a church designed for the United Presbyterian worship at Paisley. Mr. W. D. McLennan, of that city, is the architect.

HOUSE AT KENSINGTON.

THIS is an illustration of the entrance-front of a house in Kensington to which some alterations and additions have been made. The small plan shows what some of the additions were.

The dining-room was turned into a hall, and a new dining-room was added on the north-east, facing the garden, which was laid out in a formal manner. A new wing was added on the north, containing a library, billiard-room, fencing-room, and butler's pantry in the

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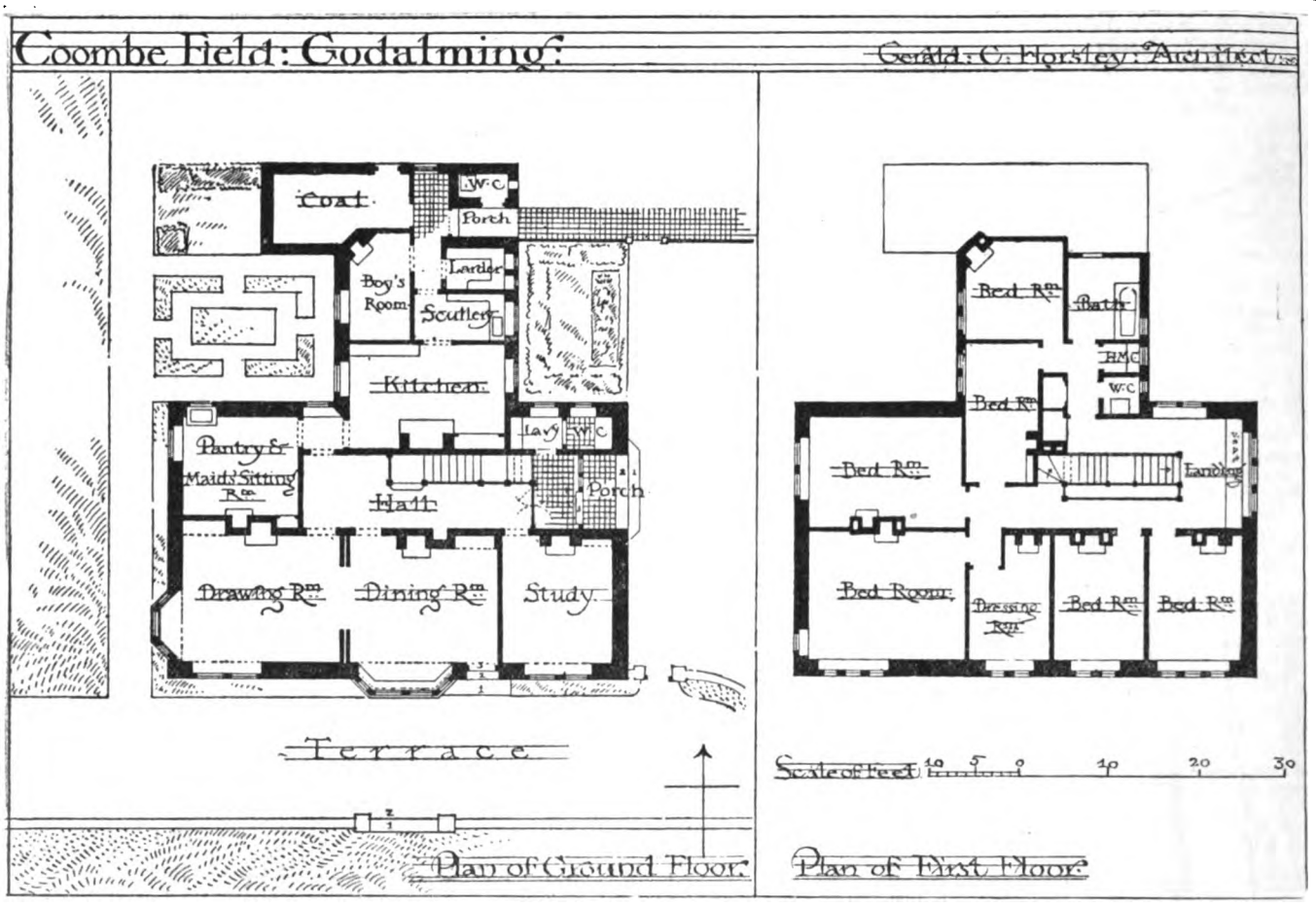

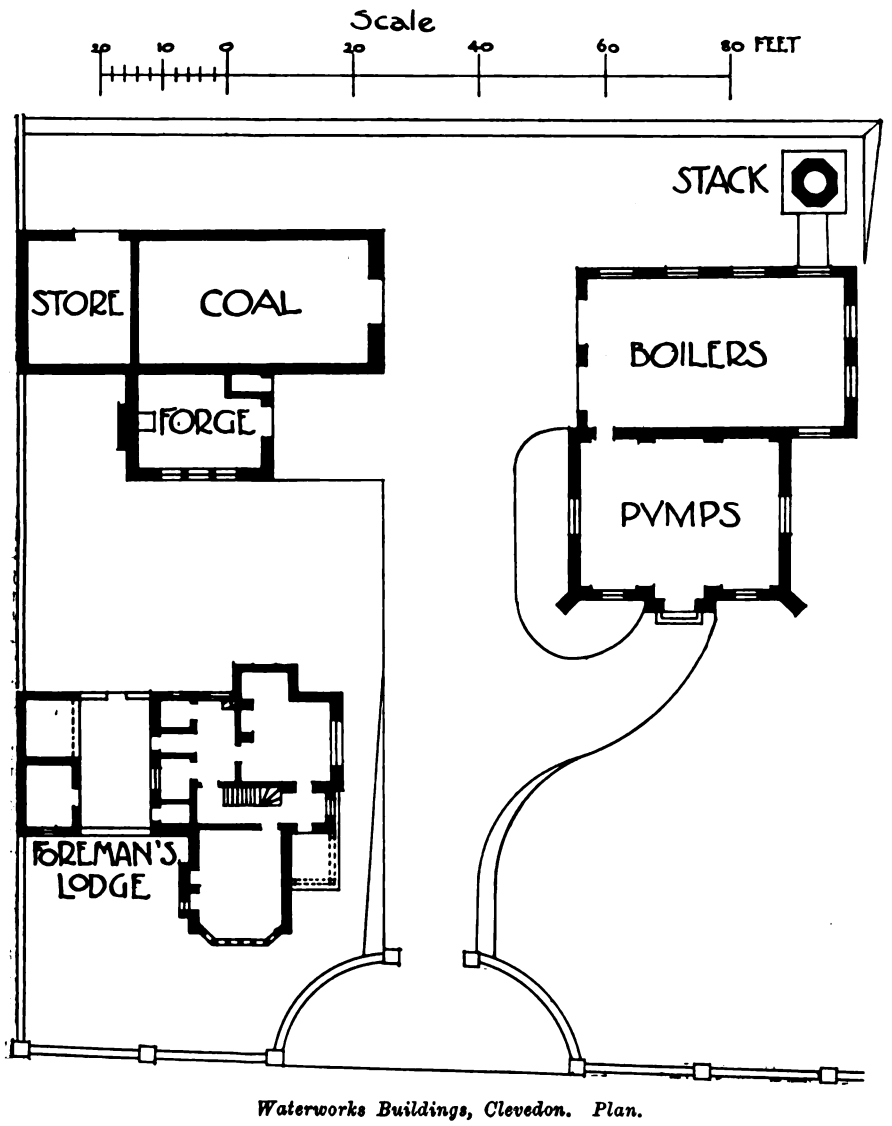

Waterworks Buildings, Clevedon. Plan.

basement, and two bedrooms, bathroom, etc., on the first floor. A new staircase was fitted; a large bay to the drawing-room was added, and on the south a new conservatory. The kitchen offices were also remodelled.

The walls to the house, when the alterations and additions were in contemplation, were faced externally with cement. These walls were rough cast, and the new walls were similarly treated. The dressings to the new work were of Monk's Park stone, and the roofs were tiled. The flèche and the enclosed covered way to the entrance were omitted.

Messrs. Whitehead and Co. were the contractors, and the work was carried out from the designs and under the superintendence of Mr. R. A. Briggs.

NEW SCREEN, DYMOCK CHURCH.

THIS screen, of English oak, has been recently erected in Dymock Church, Gloucestershire, under the arch between the nave and south transept. On the north side is a memorial inscription with the arms, etc., of the donor, and on the south a series of pateræ in the cornice ornamented with the crowned M, the rose, and pot of lilies—emblems of the Virgin to whom the altar in this transept was dedicated.

The work was executed by Messrs. H. H. Martyn and Co., of Cheltenham, from the designs of the architect, Mr. Roland W. Paul, of London. The drawing is in the Royal Academy.

NEW REREDOS AND LECTERN, ABBEY DORE CHURCH.

THE chancel of this interesting Herefordshire church was reopened during last summer after being repaired. The lectern and reredos, are gifts to the church. Both are of oak. The reredos, in triptych form, has a series of painted panels with emblems of the Passion, the Trinity, and the Virgin in the upper part, and a conventional treatment introducing the sacred monogram in the lower, while the doors will have the emblems of the Evangelists.

It was executed by Messrs. Collins and Godfrey, of Tewkesbury, the contractors for the repair of the church, and the panels were painted by Mr. Flashman, of Barnet, whose firm also executed the lectern. The altar cross and vases were supplied by Messrs. A. Stalman and Co. The designs were made by the architect, Mr. Roland W. Paul, of London. The drawing is in the Royal Academy.

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COMPETITIONS.

HOLY TRINITY CHURCH, STOCKTON-ON-TEES.—Designs for a new chancel, organ chamber, etc., at this church, were submitted by nine north country architects under motto, and on the opening of the sealed envelopes it was found that the successful architect was Mr. C. S. Errington, A.R.I.B.A., Grainger-street West, Newcastle-on-Tyne, who is to be entrusted with the carrying out of the work.

STOCK EXCHANGE, MANCHESTER.—The Manchester Stock Exchange is about to find a new home on a central site in Norfolk-street, with frontages to Pall Mall and adjoining thoroughfares. Designs were asked for from a limited number of architects in Manchester, and within a radius of 20 miles. A number of firms were selected to compete, and Mr. J. J. Burnet, architect, of Glasgow, as professional assessor, has selected the design submitted by Messrs. Bradshaw and Gass, of Bolton, who have been appointed architects of the new building, which will cost over 30,000*l.*

Books.

English Architecture. By THOMAS DINHAM ATKINSON, Architect. London: Methuen and Co. 1904.

OUR sentiments towards this little book are entirely appreciative. It is good both in matter and form, and the illustrations, which are numerous, are drawn with spirit. A map serves as a frontispiece, in which the country is partitioned up geologically as regards building materials and their influence on local characteristics of style. The idea is original, but the very limited size of the plate—it is only 4 in. by 3 in.—has misled the author into a harshness of definition that is not entirely satisfactory. It is true that there are strong racial distinctions, if one may so call them, in the architecture of any country, but these want to be very carefully dealt with, lest those lesser distinctions which impart individuality to a particular building or to a group be overwhelmed.

There is another small matter. We do not think that in the year of grace 1904 reference need have been made to the intersection of semi-circles or the *vesica piscis* as the possible origin of the pointed constructional arch. Such a suggestion is grotesque, and robs a highly important architectural feature of the dignity which has been earned by centuries of evolution. We are the more surprised, since we notice elsewhere that the speculations upon low-side windows are dealt with in the most summary fashion. So many books containing illustrations are now printed upon calendered paper, and their weight doubled in consequence, that the author may be congratulated upon having avoided this precedent. He has given us a book which it is possible to handle or to carry if desired without inconvenience; and, since it is destined, no doubt, for the general reader seeking instruction rather than students searching for reference, its form should be favourable to it.

The Lighting of Schoolrooms: A Manual for School Boards, Architects, Superintendents, and Teachers. By STUART H. ROWE, Ph.D. New York: Longmans, Green, and Co. 1904.

"CAREFUL observation has shown that a considerable percentage of those who enter the schools in apparently good health soon manifest impaired general vigour, acquire distorted spines, become near-sighted, and develop a group of more or less distressing nervous symptoms." This extract from the preface, written by Dr. S. D. Risley, of Philadelphia, furnishes the key to the able treatment which this all-important subject matter has received in this little publication. Previous writings by the author, Dr. Rowe, entitle him to speak with authority, and he has here recorded the results of experience and research in a practical way, appealing both to the organisers of, and the workers in, present-day educational establishments.

To governing bodies acquiring sites valuable information is given, particularly with regard to obstructions to light and air caused by neighbouring buildings, trees, and hills. To architects, advice and details are tendered pertaining both to the construction of new schools and to the remodelling of old buildings. In calculating window space, the author considers that a glass area, free of frames, equal to one-sixth of the floor area, is the minimum factor in the lighting of any schoolroom. Aspect, position of windows in relation to the work of the scholars, blinds, colours, window design, and the use of artificial daylight reflectors are among the numerous matters discussed and illustrated.

The teacher's duties are emphasised, wherein he is counselled to collaborate with the architect in those matters which directly affect the mental and physical well-being of the child. The questions of arranging desks and of the testing of light and sight are supplemented by appendices, which complete a handy and valuable contribution to the scanty literature on this subject.

Twelve Drawings by W. G. Mein, illustrating a Fragment by D. L. A. Jephson. London: R. J. Everett and Sons. 1903.

THIS portfolio of drawings, which, though dated 1903, has only just reached us, consists of a dozen drawings in black-and-white pen-work, illustrating an outline of a short story of a life, told in suggestion rather than in detail. It is with the drawings alone that we are concerned. They show a fine artistic sense of what can be done in pen-line only, both in the indication of effects of nature and in the composition of imaginary scenes of poetic suggestiveness. The closing one of the series, "The Path to the Rising Sun," is exceedingly fine, and would give the best idea of the artist's talent, but it would hardly be fair to him to make it cheap by reproduction. We have given, however, a reduction of No. 4, "The Tarn," as a specimen of Mr. Mein's style of work. The portfolio of drawings, covered and got up in very good taste, would make a nice present.

The Modern Carpenter, Joiner, and Cabinet-Maker. Vol. VII. London: Gresham Publishing Co.

THE seventh volume of this work treats several very difficult subjects. The section on staircases and hand-railing is obviously written by an experienced man, and is well illustrated. We may notice especially the very beautiful elliptical staircase of Plate LXXII. Parts of the text are, however, too condensed to be of much use; and this is particularly the case in the chapter on geometrical handrailing, which would be almost unintelligible to a reader who did not already know something of the subject. It seems a pity that some of the book-work in the section on geometry, Vol. III., did not bear directly on this subject, which presents greater geometrical difficulties to the wood-worker than any other. As it is, there are no cross-references between the two sections; and in fact one of the most obvious criticisms of this rather pretentious work is that the different subjects treated of might just as well be studied in separate text-books, where it is probable that they would be more clearly and exhaustively treated.

"The Tarn." From the Drawing by Mr. W. G. Mein.

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Section X. consists of two parts—one on airtight case-making, the other on woodturning; why thus grouped together we do not know, especially since they are by different authors. The chapter on airtight cases, though practically useful, of course, only to expert joiners, is clear and good. Some of the joints given—as, for instance, that for the junction of three glazing bars mutually at right angles—are models of ingenious and delicate workmanship. The two chapters on plain and ornamental turning are not so good, and exhibit almost to perfection the art of describing without instructing. The section on cabinet-making by the same author is executed with more care, but with little better success. It is amusing to compare the pious exhortation to good workmanship with which this section opens and such slovenly methods of construction as, for instance, that illustrated in the diagram for the "rule joint," p. 259, where a most awkward distortion of the quadrant is made in order to save the trouble of letting in the back-flap, knuckle inwards, in the usual way. Altogether this section is extremely poor, even from the practical standpoint; and the designs with which it is illustrated are generally in the worst style of the modern furniture trade.

The Art of Masonry in Britain. By WILLIAM DIACK. Offices of *The Stone Trades Journal.* 1904.

THE masons' trade has much to be proud of, and, as we follow the author in his descriptions of the masons' work scattered over England and Scotland, we entirely share his enthusiasm. Perhaps it would have been best to have allowed the masonic reputation to rest upon this solid foundation of achievement. For he throws half the weight upon his conception of the mediæval guild system, and his conception is not sound. The only authority of any moment whom he quotes is Dr. Brentano (whom he calls, by the way, Brenato), and he misquotes him. The author is desirous of giving an added importance to the masons' guild by planting its origin in prehistoric times, "when masons' meetings were held in the dens and caves of the earth." Dr. Brentano does speak of the guild organisation being current in the VIIIth, IXth, and Xth centuries, but it is with reference to frith guilds, and not trade guilds. He names the weavers as one of the first among the trade guilds, dating from Henry I. The trade guilds were not secret societies possessing some occult influence upon the progress of the arts. They were, on the contrary, quite matter of fact, and the precursors, as Mr. Diack is at pains to point out, of the trades unions of to-day.

Homes for the Country. By R. A. BRIGGS, F.R.I.B.A. London: B. T. Batsford. 1904.

THIS is a collection of forty-eight plates showing designs and plans for residences. "The Windmill House," at Aldeburgh, is interesting. A disused mill has been incorporated with additions. We are told that the design looks well in execution. There is also a "sketch design for a house" which is attractive, in which the offices, while grouped in a subsidiary wing, yet occupy a part of the frontage; this appears to be invested with an older country-house feeling than any of the others. Indeed, many of the designs evidently have frontages on to a high road, and are as applicable to a London suburb as they are to the country, while the majority do not seem to have been carried out anywhere. The evidences of final consideration exhibited by an executed design are frequently lacking in first essays, however suggestive.

Great Masters: reproductions in Photogravure. With descriptive text by Sir Martin Conway. London: W. Heinemann. (In progress.)

THIS fine publication, which we have before noticed, and which has now reached Part XV., continues to be as excellent as its first promise. Part XV. contains an exceedingly fine reproduction of Romney's beautiful portrait of Miss Ramus, and includes also Rembrandt's "Night Watch," with a short statement by Sir Martin Conway of its curious history (still very little known to general readers); how it was a commission from a number of respectable citizens, members of the Arquebusiers' Company, who wanted their portraits in a combined group, and complained bitterly that the demands of portraiture were sacrificed to the painter's desire for effects of light and shadow. The previous number contained, among other things, Gainsborough's "Duke and Duchess of Cumberland," in which Gainsborough was evidently thinking of Watteau, and a fine reproduction of Velasquez's beautiful nude study, "Venus with the Mirror." The work is to be complete in twenty-five parts. The publishers provide, for those who wish, a special set of hinged frames, with dust-proof backs, for arranging and displaying the engravings in sets, four at a time.

TRADE CATALOGUES.

THE General Electric Company, of Queen Victoria-street, have sent us a large catalogue of electric bells and accessories, lightning conductors, speaking tubes, and telegraph instruments. The catalogue is well illustrated, and we notice descriptions of many novelties. The ships' side-light indicator and controller not only indicates both visibly and audibly whether the lights are burning or not, but also automatically brings a reserve lamp into circuit the moment that one fails. This device seems to us to meet most of the objections that are urged against the use of electricity for ships' signal lights. The cheap forms of telegraph instruments illustrated, suitable for learners and students, ought to prove useful in technical schools. They are quite as instructive as the ordinary instruments and are only one-quarter of the cost. Full descriptions are given of the appliances used in Killingworth Hedges's "air-to-earth" system of lightning conductors. The "tubular earth" shown has much to recommend it, and its low price will make it popular.

We have received from the Edison and Swan Company of Queen-street, a catalogue of electric bells, indicators, and accessories. The catalogue is well printed and the descriptions of the various kinds of electric bells are clear and explicit. Instructions are given for connecting-up bells and indicators both in small houses and in large buildings, and the diagrams of the connexions can easily be followed by any intelligent workman. Everyone interested in electric bells should get this catalogue. They also send us a leaflet describing the "linolite" system of lighting. We have already commented favourably on this system. We suppose that the initial difficulties the inventor had with the excessive heating of the reflector and the short life and low efficiency of the lamps have been overcome. In another leaflet it is announced that the price of the high voltage "economic" fuse boards has been reduced. A break of three and a half inches is given, and as the fuse wire is in sight this ought to prove effective if the channel is always cleaned before a new fuse is inserted.

From Messrs. J. E. Spagnoletti and Co. we have received their catalogue of Stigler lifts, of the electric, hydro-electric, belt-driven, and hydraulic types for passengers and goods. Among the illustrations in this catalogue there are several designs of handsome cages and hammered iron gates and guards for passenger lifts. So far as it is possible to judge from illustrations, the various forms of operating mechanism applied to these lifts are of sound and workmanlike construction. The most interesting feature of the Stigler lift is the push-button system which, it is claimed by the makers, insures perfect safety under all conditions, and can be used by anyone without an attendant. The car will not commence to move until the door of the car and the doors of all the inclosures on the landings are closed. These latter remain locked and cannot be opened while the car is on its journey, and the only door that can be opened is that on the landing opposite the car when this is at rest, the others still remaining locked. If the door of the car be opened during a journey, the lift will immediately stop, and will only go on again when the door has been closed. There is placed in the car a stop button, so that passengers may stop the car *en route*, and, if they desire, change its direction or bring it to the ground floor without leaving the elevator. When the elevator is in motion it is entirely under the control of the passenger or attendant, all buttons on the inclosures at the different floors remaining inoperative until the car is at rest. If any door is opened, either of the car or of the inclosures on the landings, all buttons are inoperative. Therefore great care must be exercised in seeing that all doors are kept closed. All passenger lifts are fitted with three safety gears, placed one beside the other, and each one has a different purpose. In each of these cases the stopping of the cage is effected by wedges worked by three different gears. Thus (1) if the cable breaks, by a strong arrangement of levers and springs; (2) if the cage meets with any obstacle, by means of a balanced frame which is lifted parallel to its initial position; and (3) if the downward speed becomes too fast by the action of a pendulum apparatus. Stopping at the exact levels of the floors is obtained by means of a regulator which operates efficiently whatever may be the load, and without any jerking. The motor is fitted with an electric brake, which is loosened only when the circuit is broken. As soon as the travel is stopped, the brake works automatically, thus preventing the rotation of the winding drum. Should the car, during its descent, be held for any reason on its safety gears, a commutator at once stops the winding drum, preventing the further unwinding of the ropes.

Messrs. Arthur L. Gibson and Company, of London, send us their catalogue of the Kinnear steel rolling doors and shutters, which have been largely used in tramway and railway car sheds as well as in warehouses, shops, and office buildings both in this country and the United States. These doors and shutters consist of curved interlocking steel slats, fitted with malleable iron reinforced edges, providing an excellent wearing edge. Many different types of construction are described in the catalogue, with front elevations, vertical and cross sections, and end views showing the mechanism for raising and lowering the doors and shutters illustrated. While all the doors and shutters are useful for fire protection, some are specially designed for this purpose. One type is equipped with an automatic closing device, which operates at a temperature of 150 degrees F., and the curtain is released by compound levers so arranged that they are positive in action, and respond immediately to the separation of a fusible link suspended in the centre of the opening. Tension springs are provided, giving an impulse, which causes the shutter to descend rapidly as soon as released by the melting of the fusible metal.

A list of Patschke's vertical drawing apparatus for engineers and others, which is provided with scientifically designed drawing rails and guides, has been sent us by Mr. E. C. Koop, of London. By the application of weights, cords, and rollers the drawing boards, rails, and drawing instruments can be moved up and down, and the latter sideways, without bringing them out of their true position, and the draughtsman can bring the boards into any desired position from horizontal to vertical by set screws or by a slight pressure on the board. A top frame is also provided for holding the design to which the draughtsman may be working. While the draughtsman is at work only the upper edge of the rails come in contact with the drawings, the lower edge being kept away by roller bearings. The rail is balanced by counterweights, and always moves in a true position to the drawing. The largest sizes of squares which a draughtsman is in the habit of using most are connected with, and move up and down with, the drawing rail. This apparatus is made in various sizes and patterns for attachment to an ordinary table, to be supported on an easel or mounted upon a cabinet containing drawers for paper and plans.

The Atmospheric Steam Heating Co. of Grays Inn-road, W.C., send us a pamphlet describing in detail their system of warming buildings by the use of steam at or below the pressure of the atmosphere. The object of this pamphlet is to expound the advantages of a system of steam circulation "without pressure," and further to demonstrate the wide field thereby opened for the utilisation of exhaust steam in a profitable manner. Section I. is a general explanation of the system advocated, the details of which are more fully set forth by means of a typical specification given in Section II., and Section III. contains various data and miscellaneous information such as are likely to be required by those who contemplate adopting the system. Other sections in the pamphlet relate to exhaust steam heating, to the "exhauster" form of "atmospheric" heating, and to auxiliary appliances of different kinds. This system in one form or another has been adopted in many important buildings, to which reference is made in the pamphlet.

MR. PERCY PITMAN, of Ledbury, sends us a list of his "Pelton" water-wheels and turbines for any pressure of water, and of his special high-pressure "Pelton" water motors suitable for pressures of 700 to 1,000 lb. per square inch.

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A very neat arrangement is shown of a Pelton water-wheel, with shaft coupling and extended bed-plate, for direct connexion to a dynamo. When fitted with the Pitman automatic governor this motor should be found useful for electric-light installations in country houses and other places where water power is available.

Messrs. C. and A. Musker, of Liverpool, send us a catalogue illustrating their overhead travelling cranes. One illustration represents a thirty-ton overhead electrically-driven travelling crane, as supplied to the Mersey Railway Power House, at Birkenhead. The gear for this apparatus is shown in greater detail by two separate illustrations. Another sheet shows the gear for a ten-ton hand-power travelling crane, as supplied to the Exeter Corporation. Both types of crane are of massive construction and good mechanical design.

Mr. Andrew Brown, of London, has sent us a copy of the 1904 catalogue issued by Messrs. F. Meguins and Co., of Dillingen-on-Saar, Germany, containing particulars of perforated iron, steel, copper, zinc, and brass in sheets and plates up to 1 in. thick. In addition to plates with perforations of all shapes, this catalogue refers to embossed plates, which are more easily cleaned than ordinary chequered plates and do not hold water to the same extent. There are also numerous patterns of ornamental perforations suitable for machinery guards, lift enclosures, heating apparatus, and other purposes.

We have received from Messrs. W. H. Willcox and Co., of Southwark-street, their catalogue of motor engineers' specialties, which are too numerous for detailed mention, but we may say that they comprise practically all the materials, tools, and appliances likely to be required by the owners or drivers of motor cars, motor wagons, and road locomotives

Messrs. Hendry and Pattisson have sent us their new illustrated catalogue of heating and ventilating appliances, of which the most important are the well-known Boyd's patent "Hygiastic" ventilating stoves and grates. The stoves are now made in various patterns and sizes, with single or double fires and descending flues, and have been extensively used in hospitals. The grates admit warm air in a similar manner, and are supplied with iron or faience mantels of simple design. The appearance of the non-ventilating grates is less satisfactory. Among the other contents are inlet and outlet ventilating cowls, gas-heated radiators of the sectional type, and kitchen-ranges.

The Phœnix Engineering Company, Limited, Chard, send us their catalogue of municipal appliances and contractors' requisites, including apparatus and machines for road making, repairing, and cleansing; contractors', well sinkers', and other pumps; winches, hoists, and shear legs. This firm are also makers of manhole covers and frames, and cast-iron water tanks.

The Student's Column.

ARCHES.—XXI.

IN the present article we give details of the masonry bridge now on the point of completion at Plauen, in Saxony. This structure, of which Fig. 84 is an elevation and Fig. 86 a quarter plan, is remarkable as having the longest span of any masonry arch hitherto built. It was designed by Mr. C. H. Liebold to connect the opposite sides of the Syra Valley, and thus to afford convenient means of communication between the two parts of the town of Plauen. The valley itself also forms part of the town, and, as it is traversed by a highway, it was thought desirable to provide for a single span, thus avoiding the necessity for intermediate piers, which would have been objectionable under the circumstances.

As will be seen from Fig. 85, the span of the arch is 295·2 ft. and the rise above the bottom of the foundations is 59 ft. The joint of rupture on each side of the arch ring is at the height of 37·7 ft., so that the portions of the arch below these joints may be regarded as forming parts of the abutments, leaving the central portion, which really acts as an arch, with the span of 213·2 ft. and the rise of 21·3 ft. The thickness of the arch ring at the crown is 4·92 ft., and at the joint of rupture 6·56 ft. But practically the ring is 8·2 ft. thick, as the masonry of the solid backing may be treated as a portion of the arch ring. The arch is struck from five centres, with one radius of 344·5 ft., two radii of 191·9 ft., and two of 98·7 ft.

Through one abutment passes a small arched opening for traffic with a span of 43·3 ft. and a height of 19·9 ft. This arch has a rise of 16 ft., and is struck from three centres with radii of 26·9 ft. and 14·4 ft. As shown in Figs. 84 and 85, the backing of the main arch is lightened by the construction of arched openings perpendicular to the axis of the bridge. These openings are 16·4 ft. wide by 13·1 ft. high, and pass through the entire width of the bridge, thus giving the structure a lighter appearance and keeping the weight of the backing within proper limits.

The construction of the spandrels is shown by Fig. 87, which is a section on the line A B of Fig. 85. It will be seen that the spandrel walls are lightened by external arched recesses, thus affording adequate support for the footpaths without the use of unnecessary masonry. It will be observed, also, that the footpaths are corbelled out, this arrangement having for its object a similar limitation of weight. The external arched recesses are 9·84 ft. wide and 3·9 ft. deep, and their employment in this manner serves to break the monotony of what would otherwise be a wide expanse of plain wall surface, although it cannot be said that the treatment of the masonry below them is at all happy. This, however, is a matter with which we are less concerned than with details of a strictly engineering character.

The spandrel filling is of masonry, built in the form of six vaults parallel to the axis of the bridge. The two side vaults measure 5·9 ft., and the others 4·9 ft. wide, the walls between them being 1·3 ft. thick, and the arched vault covers have a rise of 1 ft. At each end of the bridge the vaults are connected by openings 6·6 ft. wide by 8·2 ft. high, so as to save masonry and to facilitate inspection, manholes being provided to afford means of access from the street. The vaults are closed by walls 16·4 ft. high, and from 2·6 ft. thick at the top to 4·9 ft. thick at the bottom. These walls and the openings between the vaults are shown in Fig. 85.

For the construction of the arch, a hard slate found in the vicinity of Plauen was used, and Bavarian granite was employed for the quarry stones of the wings, the corbelling of the footpaths, the moulding, the balustrade, and for a stairway connecting the valley with the roadway of the bridge. The stairway includes sixty-six steps, 9·84 ft. wide. The total width of the bridge between balustrades is 55·7 ft., including a roadway of 36·1 ft. wide and two footpaths, each 9·84 ft. wide. The roadway slopes from the centre with a gradient of 1 : 240, in order to provide for surface drainage, and it may be mentioned that the arch masonry is protected from dampness by asphalt felt, suitable provision being made for the removal of water by drains at the abutments.

In a work of this magnitude it will be readily understood that the most precise computation is demanded. It is necessary to take into consideration not only the weight of the structure and the incidence of the moving load in different positions, but also changes due to temperature variations and wind pressure.

In the first place, lines of resistance were determined (1) for the dead load of the completed bridge, (2) for a superimposed live load covering one-half of the span, and (3) for a superimposed live load covering the whole span, the live load being assumed to be equal to that given by trains of steam rollers. These determinations were afterwards verified by the theory of the elastic arch. The most unfavourable positions of the live load were determined for the three most critical joints—namely, the crown and springing joints, and the joint of rupture, the position of the last named being ascertained by calculation.

It was then found that the pressure on the masonry of the arch would be 953 lb. per sq. in. and on the foundations 341 lb. per sq. in., and, further, that the line of resistance was such that in no part of the structure would the masonry be exposed to dangerous stresses, and that no important

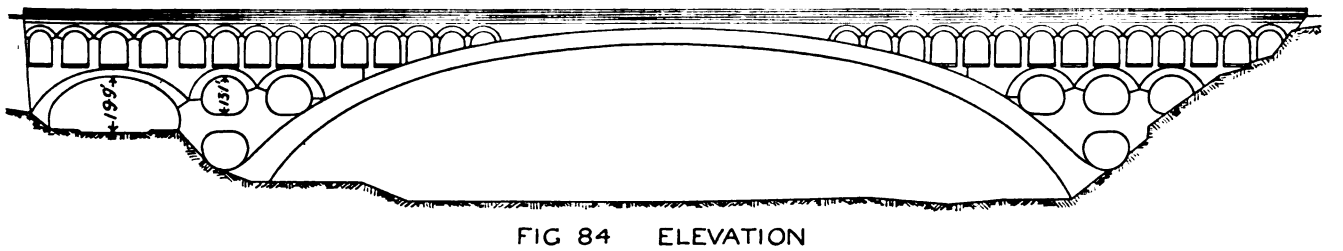

FIG 84 ELEVATION

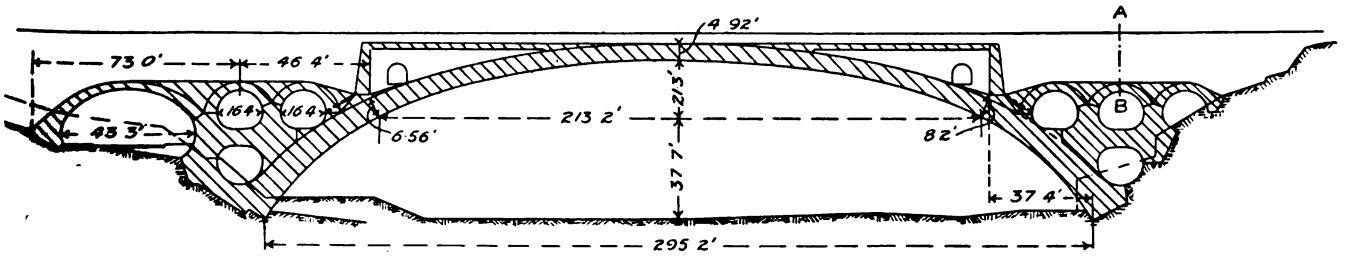

FIG 85 LONGITUDINAL SECTION

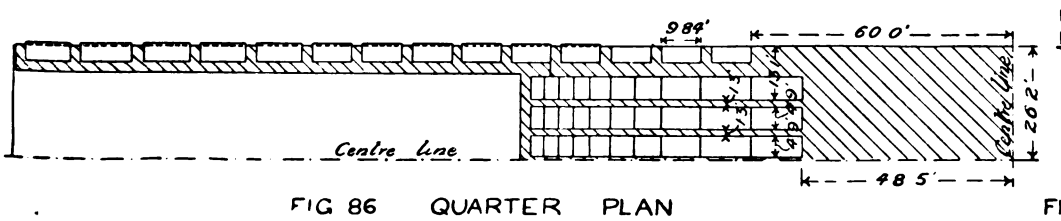

FIG 86 QUARTER PLAN

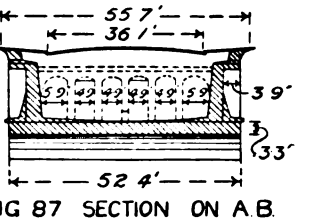

FIG 87 SECTION ON A B

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increase of stress would be caused by temperature variations. The normal temperature was assumed at 50 deg. Fahr. and a rise and fall of 72 deg. Fahr. was taken into account.

As we have before pointed out, it is very usual in modern practice to provide masonry arches with hinges, so that the line of resistance shall pass through the middle of the crown and springing joints, and to permit the masonry of the arch to accommodate itself to the alteration of form that is invariably due to the load imposed upon the centring. In the Plauen Viaduct, however, there are no hinges, for it is correctly considered that in an arch of such immense size friction at the hinges would be so great as to make it impossible for them to operate. Further, it was not thought necessary that the line of resistance should pass through any specified points, as its position was found by determination to lie sufficiently near to the centre of the ring at all points to insure safety against undesirable stresses.

It was decided to load the centring before the construction of the arch, so as to impart to it beforehand the slightly flattened curve that would be caused by the weight of the completed arch ring. It has been observed that whatever precautions may be taken, the centring invariably settles, thus causing cracks and fissures at every point where keying is effected. Accordingly, it was determined in this case to place upon the centring all the material to be used in the construction of the arch, and to build the ring in several sections in a manner very similar to that already adopted by M. Séjourné.* Before the several sections were keyed up measurements were taken which showed the depression at the crown to be less than 1 in., which is very little in a span measuring 295 ft. and weighing about 12,000 tons. Consequently it was considered that this represented the maximum change of form, and the various sections of the masonry were keyed.

The foundations of the viaduct are upon hard volcanic rock, which occurs at a depth of from 4 ft. to 6 ft. below the surface. Steps were cut into the rock, as shown in Fig. 85, to prevent any tendency for the foundations to slip. Some difficulty arose in places where the remains of disused mine levels were encountered, and, as it was impossible to ascertain how far or how deep similar workings might extend, it was decided to fill the levels discovered with concrete and, for the sake of additional security, to reinforce the concrete with a grillage of 18 in. rolled steel I-beams.

In the construction of the arch the mode of procedure was that usually adopted by Liebold and Co., in which firm the designer is a partner. The upper surface of the sheeting and the side forms of the centring were first covered with Portland cement mortar, which was thrown on with the spade. Upon this layer the voussoirs were placed, care being taken to see that the joints were in the lines of the radii of the arch ring, so as to prevent any tendency of the joints to open towards the soffit, and the mortar used for making the joints was mixed with a minimum proportion of water. The exterior voussoirs of the arch ring are quarry stones, and, in order to give the faces the appearance of cut stones, they were covered with Portland cement mortar. This was done by nailing strips of timber to the side forms and filling the spaces with cement mortar, which has the further advantage of acting as a protection to the stone against climatic influences.

We append some details relative to the centring, a part of our subject which will be discussed generally in a subsequent chapter.

As there were no hinges in the arch ring, it was essential that the centring should be particularly stiff and unyielding. Its construction and foundations presented a somewhat difficult problem, which was successfully solved by Mr. R. G. Holzapfel, another engineer associated with the firm of Liebold and Co. About 56,000 cubic ft. of sawn timber, 28,000 sq. ft. of planks, and 15,000 steel pins were used in the construction of the centring. In order to provide for traffic along the valley, an opening of 16·4 ft. was left through the middle of the falseworks. To insure a secure foundation, a series of trenches was excavated down to the solid rock, these trenches being 65·6 ft. long, 14·8 ft. wide, and about 6 ft. deep. They were filled with concrete, in which were buried spruce planks carrying the timber struts. The framing of the falseworks was so designed that, if laid directly upon it, the sheeting would have had the form of a cylindrical curve. But before the lagging was placed in position timbers of graduated thicknesses were inserted, so that the lagging, when finally fixed, was curved in an upward direction, from the sides towards the axis, and was raised slightly towards the crown. The wedges for striking the centres were designed in general accordance with the same principle, the object of which was to guard against any perceptible variation, as the result of settlement, from the form predetermined in the designs.

The wedges were placed between the second and third stages of the falseworks. The first and second stages consisted of eleven full girders, and between these half girders were provided at the ends of the arch. The third stage had twenty-one full girders, and over them the purlins carrying twenty-one rafters, on which the lagging was secured. The centring served not only to insure the correct shape of the soffit, but also to provide means for coating the faces of the arch ring, as described above. The side forms were held in position by inclined struts resting on planks carried by the extended ends of the purlins.

This viaduct was commenced in May, 1903, the arch ring being finished during November in the same year, and the centring was struck in April, 1904. It is expected that the structure will be opened for traffic during the course of the present summer.

* "Les Annales des Ponts et Chaussées," October, 1886.

OBITUARY.

MR. MARGRAVE.—We have to announce the death, on May 15, of Mr. Frederick Margrave, of No. 32, Bryn-y-Môr-road, Swansea. Mr. Margrave was the senior partner of the firm of Messrs. Margrave and Peacock, of Nos. 19-21, Metal Exchange, Fisher-street, Swansea, who, eighteen months ago, were appointed architects for the theatre at Port Talbot.

GENERAL BUILDING NEWS.

CHURCH, AUCHTERARDER.—Plans have now been prepared for the new parish church at Auchterarder by Messrs. John Honeyman, Keppie, and Mackintosh, architects, Glasgow. The church is to be built on a part of the south glebe fronting High-street. The plan of the church shows a nave of 95 ft. long and 50 ft. broad, with a single aisle 18 ft. broad. At the end of the nave, and centring with it, is a chancel 318 ft. deep and 24 ft. broad. This is separated from the nave by a chancel arch in stone, the aisle being separated from the nave by a series of stone arches, five in number, 13 ft. span, and rising to a height of 13 ft. 6 in. A feature of the building is the corner tower and spire, 16 ft. square, which serves as the main entrance to the church, and rises to a height of 45 ft. Above the vestibule portion of the tower, on the ground floor, there is a bell chamber, with bordered openings on two sides of the tower. Provision is made for organ, vestry, and church hall, these being placed at the back of the church. The estimated cost of the church and church hall is 6,500*l.* Accommodation is being provided for 920 people. The successful contractors are:—Mason work, Mr. Peter Anderson; joiner work, Mr. James Martin; slater work, Messrs. George Mailer and Sons; plumber work, Mr. J. H. Jamieson; painter work, Mr. P. Edwards; plaster work, Mr. W. M'Laren—all of Auchterarder; heating work, Messrs. J. Cormack and Sons, Glasgow.

RESTORATION OF ST. MICHAEL'S CHURCH, MARWOOD, DEVON.—The Church of St. Michael and All Angels, at Marwood, was recently reopened after having been restored. The work has been carried out under the direction of Mr. Edmund Sedding, of London and Plymouth, by Mr. H. Burgess, contractor, of Barnstaple, at a cost of 950*l.*

PRESBYTERIAN CHURCH, ARTHUR'S-HILL, NEWCASTLE-ON-TYNE.—The cost of this new church (to seat 720 people) is 6,400*l.*, including small hall, classrooms, caretaker's house, etc. The architects are Messrs. Badenoch and Bruce, Newcastle. The principal entrances are at the east end in Prospect-place, giving access to porch and large vestibule, at either end of which are fireproof staircases leading to galleries. The style of the building is late Gothic work, and will be built in local stone with hammer-dressed snecked facing and chiselled dressings. The south-east staircase is placed in a tower which occupies the angle of church nearest to Westgate-road. The tower is about 16 ft. square, and rises to a height of 65 ft. above the street, with angle turret 12 ft. higher than parapet of tower, or a total height of 77 ft. The church is planned with nave, aisles, and transepts, the galleries and roof of nave being carried by cast-iron columns. The ground floor has about 400 sittings, and galleries 300 sittings. The ground floor has a fall of 8 in. from vestibule to transepts, and will be laid throughout with wood block flooring on concrete. The pews, pulpit, gallery front, and other interior joiners' work will be executed in pitch-pine. Behind the church, on the ground floor, there is a small hall. On the first floor over same there is a large session room. Beyond the organ chamber there are two classrooms, one having direct access to gallery. The caretaker's house is placed on the second floor. The heating will be by low-pressure hot water, with radiators in vestibule, corridors, and staircases. The lighting will be by electric incandescent lamps. The contractor for the building is Mr. J. M. Whamond, Gosforth. The heating will be carried out by Messrs. Emley and Sons, Ltd., and the electric lighting by Messrs. Thos. G. Usher and Co.

ST. JOHN'S PRESBYTERIAN CHURCH, RUNCORN.—This church is being erected upon a site fronting Victoria-road, and is connected with the existing school buildings, which face York-street, entrances being provided from both streets. Accommodation is provided for about 560—500 on the ground floor and sixty in the gallery over entrances. A cloak-room is arranged near the main entrances, and a vestry for ministers' use at the chancel end of the church. The pews are so arranged as to rise towards the rear and radiate towards the pulpit. The whole of the walls rest upon concrete foundations, and the floors will be of wood block laid on concrete, so that there may be no chance of dry rot or subsidence. The general design is late Gothic in character, and has a tower and spire to the right of the main front. The front to Victoria-road is of red Runcorn stone. The contract, amounting to 3,500*l.*, is being carried out by Messrs. George Parker and Co., of Edge Hill, and the joiners' work by Messrs. J. Paterson and Son, of Liverpool, from the design and under the superintendence of Mr. T. W. Gubbon, architect, of Birkenhead, Mr. Robert Harrop acting as clerk of works.

WESLEYAN CHURCH, DARLINGTON.—A new church was opened on the 18th inst. in the new district of Corporation-road, Darlington, taking the place of a mission-room previously existing. Messrs. Morley and Son, of Bradford, were the architects. The church, which will accommodate 800 people, is in the Gothic style, being of pressed brick with tracery windows, crowned by a tower and spire also of stone. The interior woodwork of pews and ceiling is pitch-pine. The cost is over 6,000*l.*

WESLEYAN CHURCH, KIMBERWORTH.—A new school-chapel has just been opened at Kimberworth, Rotherham. The school-chapel has cost, with site, 2,500*l.* Mr. J. E. Knight was the architect, and Mr. Richard Snell the builder. The building provides accommodation for 300 adults, or, with the classrooms, for 480 children.

METHODIST FREE CHURCH, SOUTH SHIELDS.—The foundation-stones of a new Methodist Free Church were laid on the 23rd inst. at the corner of Birchington-avenue and Oxford-street, South Shields. The architect is Mr. G. R. Smith. The new buildings will cost 4,500*l.*

WESLEYAN MEMORIAL HALL, LIVERPOOL.—A new Wesleyan Memorial Hall is to be erected on a site in Renshaw-street, Liverpool. The cost of the new building will be 37,250*l.*, exclusive of the site, which will cost 4,750*l.* Messrs. Bradshaw and Gass, London and Bolton, are the architects for the new work.

SCHOOL EXTENSION, DEVONPORT.—The memorial stone has been laid of a new wing of the Morice Town Board School, Devonport. The work has been entrusted to Messrs. Pearce Brothers, Plymouth, and the architects are Messrs. H. G. Luff and Cheverton. The total cost of the enlargement will be 2,268*l.*

EXTENSION OF THE HIGH SCHOOL, ABERDEEN.—The extensions in connexion with the Aberdeen High School for Girls have now been completed. The improvements comprise the addition of a new wing and the remodelling of the heating system. The work was planned by Mr. J. A. O. Allan, Architect to the Aberdeen School Board, and carried out under his supervision by the following contractors:—Mason work, James Gauld; carpenter, Hendry and Keith; slater, George Farquhar; plasterer, A Hendry and Son; plumber, Alexander Fiddes; tile work, Alexander Stephen; painter and glazier work, J. W. Forrest; steam heating, Robert Tindall; laboratory fittings, James Garvie and Sons; electric lighting, Walter Simpson.

COUNCIL SCHOOL, DRINGHOUSES, YORKSHIRE.—A new Council school has been erected at Dringhouses from the plans of Mr. W. H. Brierley, architect, of York. The new building

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provides accommodation for 300 scholars—viz., 100 boys, 100 girls, and 100 infants—in six separate classrooms of fifty each, four of which are divided by patent folding partitions. The structure has been built of local hand-made bricks, with red sand rubber brick arches and dressings, white painted windows and green Westmorland slate roofs. Inside the building the floors are laid with hard-wood blocks set in asphalte on concrete beds, and the rooms are all warmed by open warm-air grates. Separate cloak-rooms are provided, fitted with wrought-iron coat-rails, and glazed stoneware lavatories and sinks. Mr. W. Barton, of Thorne, near Doncaster, has executed the builders' work, and Messrs. Illingworth, Ingham, and Co., of Leeds, are responsible for the furnishing. The cost has been about 2,500*l.*

SCHOOLHOUSE, ST. SILAS'S PARISH, BELFAST.—The foundation-stone of a new schoolhouse, in connexion with St. Silas's Church, was laid recently in Oldpark-road. The building will be carried out with local red brick and stone dressings. It will contain a room for a mixed school, and there will be classroom accommodation for about 200 scholars. The builder is Mr. J. E. Smyth, and Mr. Henry Seaver is the architect.

KNUTSFORD WORKHOUSE, BUCKLEY UNION.—The third portion of the work of remodelling and extending the workhouse buildings has been in progress, and (with the exception of the foul wards yet to be erected) is now nearing completion. These works comprise:—(1) New dining hall to seat 270, kitchen, scullery, stores for groceries, milk, meat, bread, hardware, etc., bread-cutting and knife-cleaning rooms, wash-up, receiving and weighing-room, general and foul clothes wash-houses, laundry, drying and airing closets, receiving and delivery rooms, laundress's room, water tower and engine-room, the connecting of the able-bodied men and women's wards and male and female imbecile wards with the new dining hall by means of glazed covered ways, the extension of the subways to the able-bodied wards, master's house block and boys' quarters, the extension of the gas and water mains in the new subways to supply the above-named new buildings, the making and forming of new roadways round the remodelled portion of the workhouse, the redrainage of the workhouse by means of an enlarged and deeper main drain, and the demolition of the old kitchen, laundry, and wash-house, dining hall, chapel, and imbecile wards. The contractors are Messrs. J. Hamilton and Son, Altrincham, whose tender was for 6,672*l.* 16s. (2) Providing and fitting-up of wash-houses, laundry and drying closets with complete machinery and engine to drive same, Messrs. D. and J. Tullis, London, 1,082*l.* (3) Providing and fitting-up of kitchen and scullery with complete cooking appliances, Messrs. Moorwood, Sons, and Co., Sheffield, 378*l.* (4) Providing and fixing in subways—steam mains, pipes, and fitttings for carrying steam to work calorifiers providing hot water for heating or domestic purposes, Messrs. Saunders and Taylor, Manchester, 669*l.* 10s. (5) Remodelling of existing bathrooms and the whole of the domestic hot and cold water arrangements in the able-bodied wards and boys' quarters, Messrs. S. Oakley and Sons, Manchester, 236*l.* 19s. (6) Furnishing of new dining hall and kitchen, Messrs. Kendal, Milne, and Co., Manchester, 147*l.* 3s. 9d. Mr. R. J. McBeath is the architect.

HOSPITAL, MANCHESTER.—A new building for Manchester Southern Hospital is shortly to be commenced. The administrative block, containing the residential quarters for the medical officers and staff and for students training in the maternity department will be placed facing Oxford-road and overlooking Whitworth Park. Behind the administrative block, and connected by corridors, are to be three blocks of wards for the maternity department, and for the treatment of diseases of women and children. These have been arranged with the wards facing south, and also graduated in height so as to allow the sun to shine over the lower buildings and into the space between the blocks. Besides the laundry and out-patients' departments at the back of the site an isolation block is provided for the reception of puerperal fever cases which occur in the home patient practice of the hospital, and for which the workhouse and fever hospitals are at present the only places available. The new hospital is designed to accommodate about 100 cases. The plans have been prepared by Mr. J. Ely, architect, Manchester.

NEW LIBRARY, GREAT CROSBY, LIVERPOOL.—The foundation stone of the new Free Library at Great Crosby was laid on the 11th inst. The new building will be faced with red pressed bricks, relieved by Stancliffe stone dressing, and the semi-circular porch will be supported by two granite columns. The library will be heated by hot-water apparatus, and will be ventilated by electric fans. The fittings of the apartments will be in oak. The builder is Mr. P. Tyson, Messrs. Anderson and Crawford being the architects.

PAVILION, BRIDLINGTON.—A new pavilion on the Prince's-parade is being erected under the supervision of the architects, Messrs. Mangnall and Littlewood. The structure is 133 ft. long and 60 ft. wide, and will accommodate 1,700 people sitting and standing. It is built chiefly of iron and glass, with ornamental pillars. The sides are filled in with glazed folding doors, the front is open to the promenade, and is reached by steps which run the whole length of the building. The pavilion has been erected by Bridlington contractors, Mr. A. T. Martindale having assisted the architects in the supervision of the building. The following firms have been engaged in carrying out the works:—Messrs. T. and F. Everingham, engineers, supplied the iron and steel work, and Messrs. Laws, of Glasgow, furnished the cast-iron work; Mr. E. S. A. Smith, roof glazing with Deard's patent; Mr. W. A. Walker, plumbing and glazing; Mr. A. A. Booth, joiners' work, including Messrs. Peace and Norquoy's patent movable shutters; Mr. G. Knaggs, painting and decorating; Mr. Limon, plastering; and Messrs. Sampson and Siddall, brickwork, masonry, and concreting.

THEATRE, WITHERNSEA.—The Withernsea magistrates held a special meeting on the 18th inst. for granting a dramatic licence to the Withernsea Assembly Rooms, which have been altered and converted into a theatre. The stage measures 30 ft. by 47 ft. Underneath the stage are four dressing-rooms and a well space, while under the main body of the building is arranged a tea-room, 62 ft. by 30 ft. The architects for the work are Messrs. Thompson and Kirton, of Hull.

FREE LIBRARY, WILLESDEN.—The new Kensal Rise Free Library was recently opened. The new building is situated at the corner of Bathurst-gardens and College-road, and the entrance has been placed in Bathurst-gardens. The hall is paved with terrazzo mosaic. On the left is the original building, consisting of the newsroom, and on the right wing is the lending library, a room 39 ft. long, 29 ft. wide, and 12 ft. high, with a counter running nearly the full length. Between the newsroom and lending library, at the back of the hall, is placed the librarian's office, with easy access to both rooms. On the first floor, entered from the landing, are the reference library, a room 25 ft. by 25 ft., and a committee-room 20 ft. by 13 ft., both 12 ft. high. Over this floor a room is provided in the roof for the storage of books and for the general use of the staff. The new building is faced externally with red Suffolk bricks with Doulting stone dressings; the windows have stone mullions, with leaded lights and iron casements. The whole building will be lighted by electricity. The fittings throughout are executed in wainscot oak, slightly fumigated and dull polished. The general contract for the building has been carried out by Messrs. Cowley and Drake, of Willesden Green. The fittings have been supplied by Mr. W. E. Tamlin, of Willesden Green, and the electric lighting has been executed by Messrs. G. and H. Turner, of Harlesden. Mr. A. H. Murray-Rust was the architect.

NEW FREE LIBRARY, HAMMERSMITH.—The foundation-stone of the new central library which is being erected on a site in Brook Green-road, Hammersmith, was laid recently. The architect for the new building is Mr. Henry T. Hare, and the contractors are Messrs. C. Dearing and Son.

NEW BATHS, LEEDS.—The foundation-stone of the new swimming baths, which are to be erected in Leeds-road, Leeds, was laid recently. The new building is estimated to cost 6,000*l.* The swimming pond will be 60 ft. long by 20 ft. wide. There will be twelve douche baths for males and ten for females, with slipper baths for both sexes, and also waiting-rooms. The plans for the structure have been prepared by the City Architect, Mr. F. E. P. Edwards, and the contractors are Messrs. John Moulson and Son, Ltd.

NEW OFFICES, WESTMINSTER.—The contract for a block of offices, to be called "Parliament Chambers," facing the Church House and adjoining the Westminster City Library, Great Smith-street, has been signed. Messrs. L. Whitehead and Co., Ltd., are the contractors, and the work is to be commenced at once and completed in twelve months from plans approved by the Ecclesiastical Commissioners, who are the superior landlords. Messrs. Palgrave and Co., of Westminster, are the architects. The building will have a frontage of 125 ft. to Great Smith-street, and be faced with red bricks and terra-cotta dressings, by the Hathern Station Terra-cotta Company, Loughborough, of special manufacture. The construction will be fireproof, and the various upper floors approached by electric lifts.

APPOINTMENTS.

DIRECTOR OF BARRACK CONSTRUCTION.—The War Office announces that Mr. Harry B. Measures, F.R.I.B.A., has been appointed director of barrack construction.

MALVERN.—Mr. W. Osborne Thorp, City Engineer, Ripon, has been appointed Borough Surveyor and Waterworks Engineer for Malvern, Worcestershire. Mr. Thorp was selected out of 233 applicants.

SANITARY AND ENGINEERING NEWS.

SEA PROTECTION AND OTHER WORKS AT GALVESTON, TEXAS.—At the present time the whole of the railway traffic between Galveston and the mainland is conducted over a single trestle bridge, and plans are now under consideration for the construction of a permanent causeway with room for two or more lines of rails. During 1903 the channel from the sea into Galveston Harbour was well maintained, and probably gained somewhat in depth, as the breaches in the jetties caused by the storm of 1900 had been largely repaired. There is now a fairly straight navigable channel of some 28 ft. in depth, and vessels drawing nearly 27 ft. have passed out with ease. The dyke, extending nearly four miles parallel with the wharf front, was completed in 1903, and the dredging of the channel between it and the wharves was finished to a depth of over 30 ft. for nearly one-third of the entire distance. The sea-wall, for the greater protection of the residential portion of Galveston, which was begun on October 27, 1902, will have the total length of 17,500 ft., a height of 17 ft., and a base width of 16 ft. Up to January 1 last, 9,370 ft., or about one-half the length of the wall, had been completed, and it is expected that the undertaking will be finished in a few months. The United States Government has before it a recommendation of a board of engineer officers to extend, at Federal expense, the sea-wall now being built, so as to join the Government property to the west of the town, and this will probably be done. It will, of course, be necessary to raise the level of a large part of Galveston, so as to slope gradually up to the crest of the sea-wall. This operation will probably occupy about two years, and for the assistance of the local authorities the State Legislature has remitted the taxes due from Galveston for a period of seventeen years.

NUISANCES FROM GARAGES AND MOTOR-CARS.—Dr. Wynter Blyth, in the last issue of the "Sanitary Chronicles of the Borough of St. Marylebone," has the following comment on the above-named subject:—"The Public Health Committee will shortly have to consider the important question of how to deal with the serious complaints of nuisance incidental to the motor-car industry. There are several garages in the district in which cars are stored, charged with petrol, cleaned, repaired, and the engines started to see that each cylinder beats in proper time and that all is in order; during this operation, more especially if the crank chamber is full of oil, or if the engine is dirty, there is considerable smell, and more or less noise. In one case the occupiers of adjoining premises have laid a formal complaint by petition, and there is not the slightest doubt that there is nuisance—nuisance that is inseparable from the industry, and one difficult to deal with without seriously interfering with a growing and important trade. It is the writer's opinion that all garages of the kind should have a special shed or room in which to start the engines; any architect could design, by means of double walls, a practically noise-proof shed; there would also have to be a flue with good draught carrying the waste gases away to the height of the highest chimneys in the neighbourhood. This means a considerable expenditure of money, but when any person establishes a new, noisy, and intermittently offensive business in densely populous localities, he must either spend money in minimising any nuisance incidental to the business, or run the risk of having his business entirely prohibited."

NEW BRIDGE, STAKEFORD, NORTHUMBERLAND.—The work in connexion with the new bridge which is to be erected over the river Wansbeck, at Stakeford, Northumberland, has been commenced. The borings for the foundations have been completed, and show that the rock is situated 37 ft. from the surface on the south side, 24 ft. in the centre of the river, and 20 ft. on the north side. The structure will be 240 ft. in length, and 24 ft. wide, in two spans of 135 ft. each. It will consist of bow-string steel girders, having stone abutments on each side on piled foundations, with a centre pier composed of a cast-iron cylinder filled with concrete, and carried down to the stone head. The piles for the two abutments will also be driven down to the hard formation overlying the stone. The carriage-way will be 20 ft. in width, with a 4-ft. footway.

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The bridge roadway will be of steel trough flooring, overlaid with concrete asphalte; and expansion will be provided by steel rollers and a lap groove. The abutments will be of freestone ashlar masonry. The bridge roads will be 24 ft. in width, and 1,400 ft. in length, and will be of macadam, enclosed in creosoted fencing. The total estimated cost is 12,000*l.*, and the plans for the work have been prepared by Messrs. David Balfour and Son, civil engineers, of Newcastle.

FOREIGN.

FRANCE.—A new group of school buildings has been opened at Villiers-sur-Marne, at a cost of 130,000 francs. M. Simon is the architect.——The jury in the competition for a new savings bank at Langres have awarded the first premium to M. Danne, of Dijon; the second to MM. Mienville and Cayotte, of Nancy; the third to M. Heurion, of Épernay; and the fourth to M. Bourgeois, of Poissy.——The jury in the competition for a covered market at Belfort have selected for execution the joint design of M. Jules Doré, architect, and MM. Schwartz and Meurer, constructional engineers.——The Municipality of Coulommiers have opened a competition for a church, at an estimated cost of 375,000 francs.——A new bridge over the Saône has just been completed at Dijon, to facilitate the communication between the departments of Jura and Côte d'Or.——A monument to the memory of Eugène Spuller, formerly Minister of Foreign Affairs is to be erected at Somberrnon.——In the sacristy of the small church at Nantes have been discovered fourteen pictures by Corot, painted to illustrate stations of the cross in a procession of the "Chemin du Croix."——During the visit of the President of the Republic to Rome a statue of Victor Hugo has been inaugurated in the gardens of the Villa Medici. M. Lucien Pallez is the sculptor.——The next Congress of French architects will be held at Paris from June 13 to 18, and an excursion will be made to Chartres and to the Château de Maintenon. The seventy-first Archæological Congress of France will be held at Puy from June 21 to 28.——M. Redon, the architect, is to commence shortly the works for the alteration of the Place du Carrousel. Percier and Fontaine's well-known triumphal arch is to be surrounded by a barrier of pillars and chains, and to be completed by stone balustrades, connecting the statues which were formerly framed in the grille of the Tuileries.——It has now been decided that the château and park of Bagatelle, the former property of Sir Richard Wallace, will be purchased by the Paris Municipality and added to the Bois de Boulogne.—A "Société Française des Fouilles Archeologiques" has been constituted, which will carry on the work in Provence, at Aix and Marseilles, as well as in Spain and Egypt.——M. Lucien Humbert, architect, of Nancy, has obtained the premium in the competition, opened by the municipality of Etain, for a group of schools.——A vote of 137,000 francs has been passed by the French Government for the rebuilding of the church of Belle-Isle-en-Mer, Morbihan.—A suspension bridge is to be constructed over the Rhône, at Pyrimont, to connect the department of Haute Savoie with that of Ain.——The Municipality of Toulon have voted a sum of 800,000 francs for the building of new schools.——Important public works are to be undertaken at Lyons, at an estimated cost of 500,000 francs. Among the works projected is included the building of two Mairies, the repair of the Palais des Arts, and the erection of a barrack.——It has been decided to transfer the Musée de Marine of Paris from the Louvre to the Hôtel des Invalides, where the Musée de l'Artillerie is already installed. The double collection will then take the name of "Musée des Armées de Terre et de Mer." The rooms left empty at the Louvre will be devoted to collections of drawings.—M. Besnard, the painter, has commenced the model for the ceiling of the Comedie Française, which will symbolise the apotheosis of the poets Corneille, Molière, Racine, and Victor Hugo. The execution of the work, which will cover a space of not less than 276 sq. mètres, will occupy three years, so that the new ceiling will not be fixed in its place till 1907.——The tomb of Zola, at Montmartre, has just been inaugurated. The monument, designed by M. Frantz Jourdain, the architect, is in red porphyry, and carries a portrait bust of Zola, by M. Solari.——A committee has been formed to purchase, and offer to the Municipality of Paris, M. Rodin's statue of "Le Penseur," at present at the New Salon.——The death is announced of Daniel Vierge, the eminent artist in black and white.——The death is also announced of the following architects:—M. Claudius Papier, member of the Société Centrale, aged sixty; M. Merle, of Paris, aged eighty-six; and M. Jules Montfort, of Nantes, aged sixty, a former pupil of Chenantail and of Questel, M. Montfort was architect of numerous private houses in Nantes and the neighbourhood, and also of the fine monument to Elie Delaunay erected there.

GERMANY.—Professor Friedrich Wilhelm Büsing died at Berlin on February 25, in his seventieth year; Büsing devoted his energies chiefly to the question of hygiene in towns.——St. Petersburg and Berlin are to be put into telephonic communication, and as St. Petersburg and Moscow are already connected, this will also bring Berlin and Moscow in communication; a special connexion is to be laid between Berlin and Warsaw.——A Society has been formed at Dresden for the preservation of the Homeland ("Heimatschutz"). The work of the Society will include the preservation of memorials, and also of natural scenery and ruins; the cultivation of local flora and fauna, the preservation of geological peculiarities, and the encouragement of national customs, feasts, and costumes. Professor Schultze-Naumburg was elected President of the Society.——The Church of St. Paul, at Halle, designed by Herr Matz, under the direction of Herr Beisner, is completed.

AUSTRIA.—A bust of the architect Theophil von Hansen, who built the Houses of Parliament at Vienna, is to be placed over the entrance to the House of Lords; the sculptor Herr Hugo Härdtl is executing the work, which is to be in bronze on a stone pedestal.——In the Vienna House of Arts, the artist Herr Johann Geller received the Emperor's prize of 400 ducats; the two Dobenau prizes of 1,000 k. were gained by the painter Herr Josef Kinzl and the sculptor Herr Theodor Charlemont, and Herr Heinrich Bauchinger received the Jubilee prize of twenty-five ducats.——New public buildings are to be built at Vienna at a cost of 516,000 k. from the plans of Herr Badstieber.——The plans for the enlargement of the Austrian Museum of Arts and Industries submitted by Herr Baumann have been accepted.——A new theatre is to be built at Krems, from the plans of Herr Jos. Utz.——A new fountain is to be erected in the market place at Tetschen; the sculptor, Herr Rudolf Weyr, has undertaken the work.——The architect, Franz Böck, died in Vienna on April 21, in his seventy-second year; Herr Böck was the director of the Union Building Society, and his name is connected with many important buildings in Vienna.

ITALY.—During the past four or five years much valuable work has been done by the board responsible for the preservation and restoration of monumental buildings and works of art in Tuscany. This board consists, so far as technical matters are concerned, of a director and four of the chief architects in Florence. One admirable work performed has been to persuade the government to cease the practice of utilising as military barracks and storehouses many Franciscan convents and chapels. In consequence, six of these fine buildings are now free from such desecration, some have been completely restored, and others are now undergoing repair.——Important works of consolidation and repair are in progress at the cathedrals of Pisa and Siena, and the campanile of Pisa, parts of which are in a dangerous state, is about to be thoroughly strengthened.——The floor and mosaics of the baptistry at Pisa have been restored, and, at the cemetery of the same city, special steps have been taken for the preservation of the frescoes of Benozzo Gozzoli.——The Church of San Giovanni, at Siena, forming part of the cathedral, is now restored to its original form and style, old frescoes once hidden are now brought to light and restored, while at the tower and cathedral of Siena, the decorations and mosaics have been repaired, and ancient windows reopened.——At Florence, the Campanile of the Badia has been restored to its original state; the cloisters of the museum of St. Mark, and the entrance hall of the Palazzo Vecchio, which was once the seat of Government of the Florentine Republic, have once more assumed their ancient style and beauty; the cloisters and campanile of the church of Ognissanti, the façade of the church of San Carlo, in the Via Calzaioli, have been thoroughly repaired; and important improvements have been effected in the Palazzo dei Vetrari, among which may be mentioned the reopening of the magnificent old windows, and the rehabilitation of old and almost forgotten frescoes. Considerable activity has also been displayed in various country districts of the province of Florence, and in the city itself much has been accomplished in the way of improvement to the various buildings containing art treasures of various kinds.

SWITZERLAND.—The sum of 903,000 francs is to be spent on the enlargement and rebuilding of the Post Office Buildings at Geneva.——The new schools at Biberist, designed by Herr Volkart, are built in the style most common in Switzerland in the XVIIth and XVIIIth centuries.

PROPOSED NEW THEATRE, RIO DE JANEIRO.—It having been decided to erect a municipal theatre for the presentation of literary and musical works on a site facing the Praca Ferreira Vianna, Rio de Janeiro, competitive plans for its construction are invited; these will be received up to July 28. Three premiums are offered. The first prize will consist of 10,000 dollars, the second of 6,000 dollars, and the third of 1,000 dollars, to be awarded, in accordance with the decision of the committee, for the best plans presented. The Prefeitura of the capital does not bind itself to follow exactly the plan accepted, but reserves the right to alter or reject any details, or cut them down, as may appear best. The committee is not to be bound to distribute the first and second prizes if the plans presented do not, in their judgment, merit that distinction, and the right is reserved to combine the first and second prizes and divide the sum equally between two competitors should it be deemed advisable. The judging committee will be presided over by the Prefect of the capital, who, in due time, will invite gentlemen of recognised authority in such matters to form part of the committee. Subjoined is a summary of the conditions to be provided for in the competitive plans:—The building is to have capacity for seating 1,400 spectators, of whom 400 will be in a gallery; the architectural and decorative designs of the building to be left entirely to the judgment of the competitors; copies of similar edifices constructed or in course of construction in Mexico or other countries will not be admitted; the building need not necessarily occupy the entire alloted area, but it must conform, not only to the municipal regulation of the capital, but to the strictest conditions as regards safety and hygiene; the use of cast iron must be avoided as much as possible, preference being given to steel over wrought iron; cast iron can only be used where the pressure or strain does not exceed 1,000 kilos. per sq. centimetre; besides the requisite accommodation for the actors, the stores, etc., and for spectators (which is left to the judgment of the architect), the internal arrangements of the theatre must include an orchestra for sixty musicians, located on a level sufficiently below the pit to render them invisible to the spectators, a parquet, a first and second row of boxes, a gallery, and a box (invisible from the pit) for the exclusive use of the Administration; the motive power for working the machinery and for illumination to be electricity, the electric power-house being located apart from the theatre building; the different rows of boxes and the galleries to be sustained, for preference, by iron brackets, in lieu of the columns generally used; the stage building to be separated from the auditorium by a dividing wall with a minimum thickness of 60 centimetres, the base of which shall be on a level with the foundations of the building, and its height be at least 30 centimetres above the roof of the auditorium; any openings made in that dividing wall for communication with the theatre shall be closed by means of a door of iron or other non-inflammable material opening towards the stage; for closing the stage front, a drop curtain of iron or other non-inflammable material shall be used, made so as to open either from the stage or the orchestra side; the cost of construction, exclusive of the cost of internal decoration, not to exceed 1,500,000 dollars.

MISCELLANEOUS.

SIAMESE TEAK TRADE.—In his annual report on the trade and commerce of the consular district of Chiengmai, Mr. Becket devotes some half a dozen closely printed pages to a review of the condition of the teak trade in Northern Siam, and the difficulties which stand in the way of its development. Having regard, however, to the fact that there are 400,000 logs already extracted and lying in the streams and rivers, he concludes that any material diminution in the timber supply is not to be anticipated within the next five years. When once this old stock has been cleared off the effect of the present limited girdling allowed in certain areas will become noticeable in the export returns, and the total annual output will probably fall from an average of 80,000 logs to one of 60,000 or less. "Thus," writes Mr. Becket, "this shrinkage in workable timber will have the immediate effect of throwing idle a considerable amount of labour and capital, and an ultimate effect after five or six years of reducing the output, a reduction, which, unless fresh areas now closed are opened, will become more and more emphasised as time goes on."

THE MIDLAND ENGINEERING BUREAU, DERBY.—This organisation, planned on lines often

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adopted in the United States, is intended to provide tuition in constructional steelwork design by correspondence. The classes start monthly, so that pupils can be enrolled at any time and commence their studies at once. In arranging the courses, practical utility has been kept chiefly in view. Examples taken from average office practice are analysed and thoroughly considered, and special attention is given to the difficulties encountered by the designer when dealing with the multifarious questions that daily occur. The intending pupil is offered a choice of two courses, the first being specially suited for those who, being already engaged in the design or manufacture of constructional steel work, have some knowledge of their subject, and the other for those who have little or no previous knowledge. Practically, the former embraces the whole of the usual applications of mild steelwork, while the latter treats of it only as applied to building and architectural works. The first, therefore, is specially suited for engineers and draughtsmen, and the second for architects and surveyors. At regular intervals, original lectures and notes are sent to each pupil, and accompanying these are questions which the student is expected to answer. It may be remarked that in neither course are the higher mathematics used, and any student familiar with vulgar and decimal fractions can thoroughly follow the whole of the work without difficulty. To such students as may be prevented by circumstances from attending classes at technical colleges or institutes, the system of study here mentioned may be found of service.

BROAD FLANGE BEAMS.—There is no doubt that many of the sections in which steel joists are commonly rolled are inconveniently narrow for architectural purposes, although perfectly suitable for most engineering requirements. Where a deep and narrow rolled joist is employed in a building, as, for instance, to serve the purpose of a bressemer over a shop-front, there are often forces which tend to rotate the member about its longitudinal axis. A narrow joist so used has little resistance to such action, and means of preventing it cause unnecessary expense and trouble. The series of wide-flanged beams, introduced by Messrs. H. J. Skelton and Co., are calculated to meet such difficulties and others experienced by the architect. These beams are not only more stable when placed on their beds than those of ordinary section, but permit more satisfactory joints to be made. For the connexion of beams with columns or stanchions, both the main girders and the joists are secured to the columns by a pair of flange-brackets and a pair of web-brackets. Owing to their wider flanges, the beams admit of far wider, and therefore stronger, fastenings to the flanges than is possible with ordinary sections, and it is evident more bolts or rivets can be used in a wide flange without causing undue weakness. Thus the girders are greatly stiffened, and, in a sense, the free length of the beam is lessened, the stiffened ends serving to increase the carrying capacity of the beam, and to decrease deflection. Another special point in connexion with joints made with this type of section, is that stanchions can be stepped into the full depth of the main girders, and held so securely that the value of a column with fixed ends can be approached much more closely than with ordinary column connexions. There is, unfortunately, a tendency among designers to pay insufficient attention to the connexions of steelwork in buildings. Steelwork is often erected upon inadequate foundations, and sometimes heavy loads are really carried by a few ¾-in. rivets. It should always be remembered that a slight inequality or defect in practical work may throw the whole load of a column upon its connexions. Moreover, it is absolutely essential that the lateral stability of any steel structure should be as carefully attended to as its strength with respect to vertical loads. The type of beam here described should certainly conduce to lateral stability, and, owing to the width of the flanges, it can often be employed in cases for which built-up sections would otherwise be necessary. Among the incidental advantages possessed by broad-flanged beams, we may mention the greater accessibility of bolts and rivets; and the facility afforded for painting all parts of the construction, a course which is not generally practicable with built-up girders.

LABOUR MARKET IN GERMANY.—Mr. Schwabach, British Consul-General, in a report on the trade of Germany for 1903, mentions that the condition of the labour market during the first half of the year was more favourable than in 1902. The improvement referred especially to the textile industry, the building trade, and some branches of the iron industry. In July this generally favourable tendency increased in consequence of the great demand for agricultural labourers and the consequent decreased influx of these labourers into the towns. The returns of the labour market were most satisfactory in September, in which month the percentage of applicants fell to the standard of the very favourable September of 1900. It was generally noted with satisfaction that the labour market for males, which had been overcrowded for two years, had improved considerably. The building trade again attracted large numbers of workmen; in fact, last year was characterised by an unusual activity in building. Wages have recovered from the reaction in trade much less than the extent of occupation. The depression in prices since the middle of 1900 had necessitated an average decrease in wages, and a reduction in the hours of labour, which became still more accentuated by reason of severe restriction of production, etc. During the period of reaction, disputes, aiming at increase of wages, had no chance of success, and, in view of the condition of industry, were not justified. It was not until the year 1903 that wages and labour disputes assumed greater proportions, chiefly in those industries in which business was comparatively brisk. They were particularly frequent, although generally of short duration, in the building trade. The activity in that trade favoured the demands of workmen in many quarters, which varied considerably according to the standard of living and general condition of wages in the different parts of the country. As a rule the objective was to bring about decreased hours of labour—in some parts abolition of piecework—everywhere, of course, a demand for higher wages, and in many places a fixed scale, either for one year or a number of years. Long hours of work and low wages obtain in the building trade in Silesia; for instance, the wages of bricklayers for an average working day of eleven hours are so low that almost everywhere "overtime" is done, a day of fourteen hours being frequent in summer. In the three Silesian towns of Beuthen, Kattowitz, and Königshütte, the bricklayers received, in 1895, 25 or 26pf. per hour; in 1898, 26½ or 27pf.; in 1900, 29pf.; and in 1902, 25pf. per hour. In the north and west of Germany, considerably higher wages are being paid. At Cologne the bricklayers demanded a minimum wage of 55pf. (6½d.) per hour; in Hamburg, the carpenters were granted 70pf. (8d.) per hour, and a working day of nine hours. In Hanover, an agreement was arrived at on the basis of 52pf. (about 6½d.) per hour for bricklayers, and 40 pf. (5d.) per hour for labourers, working nine and a half hours per day. In Düsseldorf, the bricklayers demanded a minimum of 55pf. (6¾d.), and in Elberfeld, Barmen, and Dortmund 48pf. (5¾d.) per hour, for a day of ten hours. Fixed scales, regulating the hours of labour and wages have been adopted in a number of places. In the carpenters' trade these scales were in 1902 operative at twenty-seven places, and in May, 1903, at fifty-three. In larger towns, where price scales were in force, the total hours of work and the wages earned in the year 1902 were as follows:—

Locality.	Total Time Worked Per Annum.	Annual Wages. £	s.	d.
Berlin	2,610½	84	16	10
Bremen	2,572½	77	3	6
Hanover	2,674	66	17	0
Kiel	2,731	81	18	7
Leipsic	2,512	69	1	7
Magdeburg	2,746½	64 to 68	10 to 13	11 to 3
Mannheim	2,822½	63	10	2
Stettin	2,783	68	1	9

COMMONS AND FOOTPATHS PRESERVATION SOCIETY.—The report of the Kent and Surrey Committee of this Society for 1902-3 states that during the year under review the Committee's aid was sought in over forty cases involving the preservation of commons, village greens or open spaces; and in addition to the work of protecting commons and open spaces, no fewer than sixty-eight cases of interference with rights of way were dealt with by the Committee in 1902. More cases were dealt with in 1902 than in any previous year. They have embraced disputes with reference to footpaths, bridle ways, roadside wastes, commons, common fields, fuel and poors allotments, village greens, and ponds, in various parts of the two counties. The Committee records with satisfaction that schemes are proceeding for the regulation of Merrow Downs, Oxshott Heath, and a portion of Horsell Common. In a number of other instances it is probable that schemes will also be promoted in the near future. The threatened enclosure of portions of Sevenoaks and Fawke Commons has led to the formation of a vigorous centre of the Committee for Sevenoaks and the surrounding district, and mainly in consequence of its efforts the proposal was abandoned. The work of scheduling commons and rights of way is proceeding as rapidly as possible, and has now been completed or is progressing in respect of over 108 sq. miles of Surrey, and 36 sq. miles of Kent. It is hoped eventually to publish maps recording the result of the researches conducted by the Committee. It is added that, through the generosity of a supporter, 1,000*l.* has been guaranteed by the Commitee towards the cost of the scheme for purchasing the summit of the Oak of Honorhill, in Camberwell, as an open space, and the Committee is glad that the agitation which followed the enclosure of the hill in 1897 will eventually lead to the permanent preservation of the summit.

DISFIGUREMENT BY ADVERTISEMENTS.—A circular letter has been received by the Metropolitan Borough Councils from the Secretary of the Royal Institute of British Architects drawing attention to the abuse of buildings by advertisement hoardings, and urging the importance of powers being acquired by public authorities to regulate the display of advertisements which threaten permanently to disfigure the streets, and to destroy architectural significance in buildings. The communication will be considered by the General Purposes Committees of the various councils.

THE OLD CASTLE OF DUMFRIES.—At a meeting of Dumfries Antiquarian Society recently, Mr. James Barbour, architect, read a paper on "Vestiges of the Old Castle of Dumfries," to which Robert Bruce proceeded when he had slain Comyn at the monastery of the town, and which was captured from the English garrison. The castle was at the south end of the town, close to the river Nith, in a property known as Castledykes, and which was lately purchased by the Town Council to obtain on part of the land a site for sewage purification works. Mr. Barbour stated that it had been a moated castle, and the fosse encompassing the citadel could still be clearly followed on the north, east, and west sides. On the east side, where it is open and practically intact, it is from 25 to 30 ft. deep, 6 ft. wide at the bottom, and 50 to 60 ft. wide at the top. They appeared to be as large and formidable barriers of defence as any of the ditches of military works reported in the proceedings of the Society of Antiquaries of Scotland. Edward I., in the year 1300, greatly strengthened the castle. According to calculations made by Dr. George Neilson, in his monograph on "Peel, its meanings and derivation," ditchers to the number of 250, with some women helpers, worked on the fosses for a fortnight, and sixty to 100 carpenters, with two dozen smiths, were continuously at work for a period of between two and three months, cutting timber in Inglewood Forest, Cumberland, and in woods near Dumfries, transporting the material and constructing with it a strong palisade round the castle. Whether the palisade was the only carpenter work overtaken seemed doubtful, considering the number of workmen employed and the time occupied. Might not the scheme of strengthening the place embrace the building of a wooden tower? It was a notable circumstance that masons were not represented among the craftsmen. We had no evidence of stone buildings. The Chairman (Mr. W. Dickie) expressed the hope that the Town Council would carefully preserve the still existing remains of this historically interesting castle, and do something to restore portions of the fosse which had been filled up; and Mr. Barbour said he hoped to see the property soon added to the public park.—*The Scotsman.*

CLOSEBURN RED FREESTONE.—One acknowledged disadvantage attending the employment of limestone, dolomite, calcareous sandstone, and some other building stones, is their rapid deterioration in the atmosphere of large cities. The Closeburn freestone, which has been quarried in Dumfriesshire for fully two centuries, has been found by practical experience to possess remarkably good weathering qualities, being very little affected by acids and variations of climate. Its endurance is sufficiently evidenced by the excellent condition of various buildings in Glasgow, and in the manufacturing districts of Lancashire. We have recently had an opportunity of examining a specimen of this stone under the microscope, and find that it is made up of a mosaic of pieces fitting rather closely, with a cementing matrix. The fragments forming this mosaic are of quartz, angular and sub-angular in shape, fairly uniform in size, and appear to be derived from granite rocks, the cement by which they are held together being of ferruginous siliceo-argillaceous character. Although the quartz grains do not exhibit the secondary growth possessed by some sandstones, they are firmly interlocked and joined by a chemically stable cementing material.

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Another advantageous feature of the stone is that lamination planes appear to be entirely absent, a fact apparently attributable to the small proportion of mica present. Chemical analysis shows an entire absence of lime, and that nearly the whole of the iron present is in the stable form of ferric oxide. To the latter circumstance may be attributed the durability of colour distinguishing this stone. The Closeburn quarries are now equipped with modern stoneworking plant for the purpose of preparing selected stones while the material is still soft and filled with "quarry water," which, being brought to the surface and evaporated, leaves behind an indurating skin or crust protecting the surface from hostile influences. Although extensively used in Scotland and the North of England, this stone is but little known in London, the only building where it may be inspected, so far as we are aware, being the infant schools, in Railway-street, Barnes.

CAPITAL AND LABOUR.

A SCHEME TO AVOID STRIKES IN THE BUILDING TRADE.—At the North-Eastern Hotel, York, a conference took place recently (as we mentioned in our last week's issue) between ten representatives of the Yorkshire Federation of Building Trades Employers and a similar number of representatives from the headquarters of operatives' organisations, for the purpose of discussing the question of closer union between masters and men "upon a broad principle of equity." The following scheme, which had already been discussed and approved by the master builders' associations in Yorkshire, was mutually agreed to, and a resolution passed that it be referred to the respective national associations in the hope that it would find general adoption:—(1) That local committees shall be appointed in all districts where labour is sufficiently represented to warrant the formation of such a committee, by both masters and men, for the purpose of dealing with questions in dispute of a minor character, and also with questions of greater importance in the initial stages of the grievance, with a view to settling disputes locally. The minutes of the proceedings shall be taken by each secretary. (2) That a county conciliation board shall also be instituted, which shall be elected annually, and shall consist of two representatives from each section of building trades of operatives, of the one part, and a like number of representatives of the Yorkshire Federation of Building Trade Employers of the other part, whose duties shall be to consider any question upon appeal from the local committee. (3) It shall be competent for the local committees to hold meetings, but time to be occupied shall not be more than fourteen days from date of notice from either side on any case brought under its notice, and, if a satisfactory settlement cannot be arrived at within the month, it shall be the duty of the secretaries of the local committees to notify either side to the other that notice must be given to the county conciliation board within ten days to convene a meeting, for the purpose of hearing the appeal from the local committees as early as possible. The minutes of the local committees, together with the chairman's report, must also be submitted to the county board. (4) Should the county conciliation board be unable to agree after all matters, minutes, and correspondence in reference to the question at issue shall have been openly and freely discussed (at one meeting only), and the questions in dispute shall not have been settled, then it shall be competent for either side, within seven days after such sitting of the board, to appeal to the Board of Trade to appoint a referee or arbitrator, whose decision shall be final and binding on all parties, and the cost incurred thereby shall be borne equally between operatives and employers. (5) It shall be clearly and distinctly defined that, pending the settlement of any dispute or alteration of rules, in passing through the various stages, no stoppage of work shall be allowed under any pretext whatever.

Legal.

WORKMAN'S CLAIM FOR DAMAGES AGAINST EMPLOYER.

THE case of Rouse *v.* Dixon came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Wills and Kennedy, on the 19th inst. on the appeal of the plaintiff from the decision of the County Court Judge of Croydon.

The facts were these:—The plaintiff, a workman in the employment of the defendant, on September 8, 1903, sustained personal injuries in the course of his employment during some building operations. On September 30 the plaintiff gave the defendant notice of the injury, and on October 14, made a final request for arbitration under the Workmen's Compensation Act, 1897. Defendant filed an answer that plaintiff was not entitled to compensation under the Act, as the building on which the accident happened was under 30 ft. high. The plaintiff then gave defendant notice of abandonment of his claim for compensation under the Act, and the matter, not being proceeded with, defendant was awarded the costs incurred in respect thereof. On January 21 plaintiff started an action for damages in respect of the same injuries under the Employers' Liability Act, 1880. When that action came on for hearing in the Croydon County Court, defendant took the preliminary objection that, plaintiff having made a request for arbitration under the Workmen's Compensation Act, and had exercised his option under section 1, sub-section 2, his action under the Employers' Liability Act was barred. The County Court Judge adopted this view, and gave judgment for the defendant without hearing the case on its merits. Hence the present appeal of the plaintiff.

At the conclusion of the arguments of counsel, the Lord Chief Justice, in giving judgment, said that a workman was only debarred from taking alternative proceedings where he had exercised an effective option, and, in his opinion, when the workman had acquiesced in a preliminary objection to proceedings which he had, by mistake, commenced, and had been ordered to pay the costs of those proceedings, he was not debarred from bringing an action to obtain damages under the Employers' Liability Act. He thought the appeal must be allowed, and the case remitted to the County Court to be heard on its merits.

Justices Wills and Kennedy concurred.

Mr. Broxholm appeared for the appellant, and Mr. Griffith Jones for the respondent.

POINT UNDER THE METROPOLIS LOCAL MANAGEMENT ACT.

THE case of Skinner *v.* Hunt and others came before the Court of Appeal, composed of Lords Justices Vaughan Williams, Stirling, and Cozens-Hardy, on the 20th inst., on the application of the defendants for judgment or new trial on appeal from verdict and judgment at trial before Mr. Justice Ridley and a common jury in the King's Bench Division.

In this case the plaintiff claimed damages against the defendant for alleged wrongful distress, the defendants counterclaiming against the plaintiff for two quarters' rent. The case was tried before Mr. Justice Ridley and a common jury, and the jury awarded the plaintiff 50*l.* damages on the claim. The case was then argued before his lordship on a point of law arising on the admitted facts under section 96 of The Metropolis Local Management Act, 1862. The admitted facts were these:—The plaintiff was the tenant and occupier of a shop, under a lease from one, Budd, for a term of twenty-one years, at the rent of 40*l.* per annum, being payable quarterly. The lease contained a covenant by the lessee that he was to pay all rates, taxes, and assessments whatsoever, and all charges imposed by any local authority upon the frontages in respect of the taking over the roads and footpaths abutting upon the demised premises, or the making or repair thereof.

On February 22, 1900, plaintiff received notice that defendants had been appointed receivers of the rents of his premises, and that he was to pay his rent to them. On December 18, 1902, the plaintiff had a notice served upon him from the Wandsworth Borough Council not to pay his rent without first deducting 34*l.* 19s. 2d., due to the Council under an apportionment of the estimated cost of paving the roads and footpaths. On January 20, 1903, the plaintiff paid the Council 10*l.*, the quarter's rent due from him at Christmas, 1902, and informed the defendants of the fact. On January 22, 1903, the defendants demanded payment from the plaintiff of the rent due from him on December 25, 1902, which the plaintiff did not pay, and on February 12, 1903, defendants levied a distress upon the plaintiff's premises, and then the plaintiff brought the present action. On behalf of the defendants it was contended that, by the terms of the covenant, the plaintiff had entered into in his lease, he could not deduct what he had to pay out of his rent, and that, as he had not paid his rent to them, the distress was lawful.

On behalf of the plaintiff it was contended that the charge for paving was, by The Metropolis Management Act, 1862, imposed upon the owner, as it was an improvement of his property, and that the Council were going to take from the tenant what the landlord owed, and that therefore the distress was illegal. Mr. Justice Ridley held that, in the circumstances of the case, the right to distrain had gone, and that there must be judgment for the plaintiff for the 50*l.* damages on the claim, with costs, and also for the plaintiff on the counterclaim, with costs. Hence the present appeal of the defendants.

Mr. J. A. Hawke appeared for the appellants; and Mr. Lushington and Mr. Tindal Atkinson for the respondent.

At the conclusion of the arguments of counsel Lord Justice Vaughan Williams, in giving judgment, said that the question was whether, at the moment when the distress was levied, any rent was due for which the landlord could distrain. If the rent was due there was nothing wrong in the distress; if it was not due the distress was wrongful. The real question was whether the tenant, having regard to the terms of his lease, had a right to deduct, or set off, this payment when he was called on to pay the rent. On the terms of the lease it was clear that, if it was a payment of the charges of the local authority, the tenant had not that right. The proviso at the end of section 96 of the Act showed clearly that the section did not affect the tenant's covenant to pay the charges imposed by the local authority. The local authority could not have given the tenant a receipt for the rent, they could only give a receipt for the costs and expenses which they were entitled to domand, and which were paid to them in that way. There was nothing in section 96 which took away the landlord's right of distress. The result was that the rent remained due and the distress was lawful, and the defendants were entitled to judgment both on the claim and counterclaim.

The other Lords Justices concurred, and the appeal was accordingly allowed, with costs.

ACTION BY LOCAL AUTHORITY.

THE case of the Mayor, etc., of Ealing *v.* Gibbon came before Mr. Justice Kekewich, in the Chancery Division, this week—an action by the plaintiffs for an injunction to restrain the defendant from pulling down, removing, damaging, or otherwise interfering with a ventilating shaft.

Mr. Stewart Smith, K.C., and Mr. Bridges were counsel for the plaintiffs, and Mr. P. O. Lawrence, K.C., and Mr. Holt for the defendant.

The plaintiffs' case was that, at the centre of the junction of the four highways, Kentgardens, Victoria-road, Castlebar-hill, and Cleveland-road, Ealing, there stood a hollow iron shaft, about 11 ft. high, which communicated with, and formed part of, the public sewer. It was erected in its present position about twelve years ago by the then local authority. It had now become vested in the plaintiffs. In August, 1903, defendant wrote to the plaintiffs asking them to remove the shaft, he claiming the land on which it stood. Plaintiffs refused, and defendant then wrote that it was his intention to do so as the plaintiffs had refused. The writ in the action was then issued, and plaintiffs got an interim injunction to restrain the removal, pending the trial of the action. The plaintiffs said that it was the defendant's intention, unless restrained, to remove the shaft back, which, they said, would be a trespass upon their land and property, and would materially interfere with the necessary and proper ventilation of the sewer.

The defendant, by his defence, denied that he was committing any trespass in removing the shaft, and that the plaintiffs were the owners of the land, or that it was vested in them. He claimed the land and the right to remove the shaft.

After hearing evidence, his lordship found that the place in question was dedicated to the public in 1866, when the then local authority took the roads over. In his opinion, the plaintiffs had succeeded in the action, and he entered judgment for them.

Judgment accordingly.

CLAIM BY A DARLINGTON ARCHITECT.

AN action to recover the balance of an account, which totalled 17*l.* 18s., for professional services, was brought by G. W. Davis, architect, against W. J. Bloxham, draper, Blackwellgate, at the Darlington County Court on the 11th inst., before his Honour Judge Templer. The amount in dispute was 2*l.* 1s. 7d. The particulars, as briefly outlined by Mr. E. Wooler, who appeared for the plaintiff, were that Mr. Bloxham decided to build a small villa at Blackwell, and he employed Mr. Davis as his architect. The charge for the plans and superintendence of the building of the house agreed upon was at the rate of 2½ per cent. on the cost. The house cost 592*l.* The 2½ per cent. on that amount was not disputed by defendant. Mr. J. F. Latimer, who represented the defendant, said they objected to the item of 1*l.* for making a special survey of the site, and other charges for extras.

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incurred, measuring up extras and omissions. Commission was claimed with respect to the cost of an old fireplace which was removed from defendant's premises in Blackwellgate and used in the new house. Mr. Wooler said that, according to the usages of the profession, Mr. Davis was entitled to charge commission for such items. When defendant bought his site he wanted to be quite certain that he got the exact quantity of land, so he asked plaintiff to make a survey of it. Mr. Davis gave evidence in support of his case, and mentioned several extras that the defendant desired whilst the house was being erected. Mr. F. Martin, architect, gave evidence as to the practice of architects in similar cases, and said the 2½ per cent. would not include the survey of the site and the measuring up of additional work. Mr. Latimer submitted that the agreement between the parties was that the cost of the plans and the superintendence of the erection of the house was to be at the rate of 2½ per cent. on the cost of the house. His honour did not see why plaintiff should not have the cost of measuring up, which really was a safeguard in the interests of Mr. Latimer's client. His honour gave judgment for the plaintiff, with costs.—*Darlington Star.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

11,678 of 1903.—J. G. A. KITCHEN and L. P. PERKINS: *Manufacture of Tubular Radiators for Condensing, Cooling, and Heating Apparatus.*

A tubular radiator, consisting in the combination of a metallic coil, formed by lapping wire round a mandril of oblong section, with rounded ends of such size that, after withdrawal of the mandril, each two adjacent flat sides of the coil diverge from one another, and the rounded corners of each lap are set over relatively to the corners of the next lap, and a tube inserted into said coil.

13,289 of 1903.—G. G. BRODIE and J. D. PRIOR: *Fire-grate.*

This relates to fire-grates, and consists in providing the open front of the fire-grate with a double flap door or doors, that is, a door or doors, the parts of which are capable of folding on one another when the door or doors are in their position out of use.

14,987 of 1903.—R. BLUME: *Manufacture of a Varnish Substitute from Rosin Oil.*

The manufacture of a varnish substitute by preparing a mixture of non-drying vegetable or mineral oils with brewer's pitch, and then adding and incorporating rosin oil and driers with the mixture, and heating the mixture until the desired uniform consistency is obtained.

25,002 of 1903.—W. OMIT, T. OMIT, and W. OMIT, JUN.: *Combined Fire Door and Ventilator for Ranges.*

This invention relates to the construction of fire doors on ranges, by combining the door with a sliding ventilator so that the fire door need never be opened, unless for roasting; the supply of cold air to cause the fire to burn being regulated by means of the sliding ventilator.

177 of 1904.—T. B. SAMUEL: *Chimney Cowls.*

A device, consisting in the combination of a base portion, comprising two overlapping sections, depending flanges on the free edges of said sections, means for adjusting the sections, slotted clamping plates within the base, arranged perpendicular to the overlapping edges of the sections, slots in the opposite end flanges of the two sections, threaded rods in line with the said slots, and journalled in lugs projecting from said end flanges, and flanged taps upon said rod slidably disposed within the slots of the clamping plates.

6,952 of 1904.—A. MOLE: *Hanging of Window Sashes, and the like.*

Means for hanging window sashes, and the like, consisting in the combination of the cords, wires, or chains, connecting the two sashes, and passing over pulleys in the upper portion of the frame, and the means for adjusting said wires, cords, or chains, comprising long bolts or screws and nuts, fitted with loops for attachment to the ends of the cords, wires, or chains.

12,535 of 1903.—E. LANSING and E. F. BURCH: *Raising and Lowering Apparatus applicable for Fire-escapes, and other purposes.*

Apparatus for raising and lowering purposes, specially applicable for use as a fire-escape, consisting of a suitable frame carrying a drum, on which a rope is wound, mounted upon a fixed spindle, or the like, one end of a spring, placed in the interior of the drum, being attached to the fixed spindle, and the other end to the drum, so that the unwinding of the rope winds up the spring, and *vice-versâ*, a suitable governor being provided, driven by the rotation of the drum, to regulate the speed of rotation thereof as the rope upon it is unwound.

14,085 of 1903.—A. SCHULER: *Glass Plates for Facing Walls, and for like purposes.*

A glass plate for wall covering, and other mosaic decorations, characterised by the back surface of a glass plate, provided or not with painting or decoration, and having any desired shape or form, being covered by fusing with a layer of precious metal, and this, in turn, covered with a firmly-adhering cement layer, for the purpose of enabling the said plate to be permanently and securely fixed to its foundation.

6,654 of 1904.—O. H. SCHWARZ: *Walls and Partitions, and Slabs therefor.*

A slab or plate for use in building having chamfered corners and recessed edges, extending wholly or partly through the thickness thereof, and provided with inclined and crossed truss wires projecting at said corners and edges in such a manner that said plates can be directly connected to each other to form a wall or partition, the connected trusses forming a continuous trussed system with suspension means for taking the weight of the wall.

6,923 of 1904.—E. REINEKE: *Manufacture of Cement Asphalte Plates or Slabs.*

A process of manufacturing cement—or concrete—plates or slabs with an asphalte covering, consisting in pressing the asphalte coating upon the cement plate whose upper surface is provided with intersecting longitudinal and transverse grooves.

7,028 of 1904.—LEVIE FRERES (Société en nom Collectif): *A Process of Preparing and Burning Cement, and other Analogous Materials.*

A process of preparing and burning cement, or other materials treated in a similar manner, consisting of kneading, working up, grinding, or otherwise intimately mixing in the desired proportion, an inexpensive fuel such, for example, as poor or inferior coal dust, with the lime paste or limestone, or other material to be treated, to obtain an intimate mixture which, after drying, may be directly placed in the kiln without separate fuel.

7,231 of 1904.—F. G. S. HAM: *Traps, Gullies, and the like.*

This invention relates to that class of traps, gullies, and the like, in which a float or ball is employed to hold back the water in the event of an accumulation from the outlet side, and so prevent back flooding, and the object of the invention is to provide seatings for the ball valve and means of attachment for same to facilitate placing the seatings in position and renewal of same when required.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 12.—By HUMBERT & FLINT (at Portsmouth).

Portsmouth, Hants.—"The Milton House Estate," 4 a. 1 r. 5 p., f. £6,100
"The Milton Estate," including brickfield, 38 a. 3 r. 8 p., f. 23,000
Three freehold wharves, allotments, etc., area 9 a. 3 r. 35 p. 4,200

May 14.—By STEPHENSON & ALEXANDER (at Cardiff).

Mountain Ash, etc., Glamorgan.—The Abercwmboi Estate, area 259 acres, together with f.g. rents, 241*l.* 6s. 2d., "The Capoch Inn," fifteen houses, allotments, etc. (in one lot) 17,400

May 16.—By MARTEN & CARNABY.

Dulwich.—215 and 217, Clive-rd., u.t. 95½ yrs., g.r. 15*l.*, y.r. 78*l.* 590

By ALFRED RICHARDS.

Kingsland.—88, Buckingham-rd., u.t. 21 yrs., g.r. 4*l.* 10s., y.r. 36*l.* 205
Tottenham. — Springfield-rd., f.g. rents 39*l.* 10s., reversion in 65 yrs. 915

By THURGOOD & MARTIN.

Richmond.—35 and 37, Church-rd., u.t. 45½ yrs., g.r. 14*l.*, y.r. 90*l.* 600
43 to 49 (odd), Church-rd., u.t. 44½ yrs., g.r. 28*l.*, y.r. 183*l.* 1,200

By WEATHERALL & GREEN.

Minories.—Nos. 124 and 125 (s.), and 2 and 3, Vine-st., area 2,800 ft., Corporation lease, g.r. 16*l.* 8s. 10d., fine nil, y.r. 260*l.* 4,700

By ROGERS BROS. (at Peckham).

Peckham.—22, The Gardens, u.t. 71 yrs., g.r. 9*l.*, p. 325
12, Lyndhurst-gr., u.t. 62 yrs., g.r. 5*l.*, w.r. 36*l.* 8s. 230
22 and 26, Gowlett-rd., u.t., 64 yrs., g.r. 14*l.*, y.r. 58*l.* 630
35, Adys-rd., u.t. 70 yrs., g.r. 5*l.*, w.r. 45*l.* 10s. 295
Bermondsey.—60 and 62, Tranton-st., u.t. 29½ yrs., g.r. 7*l.*, w.r. 33*l.* 16s. 370
Dulwich.—351 and 353, Upland-rd., u.t. 75 yrs., g.r. 14*l.* 14s., e.r. 64*l.* 430

By WAINWRIGHTS & HEARD (at Frome).

Great Elm, Somerset.—The "Eagle Inn," and 0 a. 0 r. 31 p., f., y.r. 21*l.* 10s. £1,000

May 17.—By CHINNOCK, GALSWORTHY & Co.

Berkeley, etc., Glos.—"Baynham Court Farm," 131 a. 3 r. 4 p., f., y.r. 210*l.* 16s. 10d. 4,300

By E. HILL CLARKE.

Streatham-hill.—Woodfield-av., "Atcombe," and 3½ acres, u.t. 54 yrs., g.r. 80*l.* 14s., p. 1,400

By C. W. DAVIES & SON.

Holloway.—62, and 64, Andover-rd., u.t. 48yrs., g.r. 10*l.*, w.r. 78*l.* 440
Camden Town.—6 and 7, Pleasant-row, u.t. 33½ yrs., g.r. 15*l.*, w.r. 63*l.* 14s. 200

By DEBENHAM, TEWSON & Co.

Piccadilly.—Stafford-st., "Shelleys," f.g.r. 100*l.*, reversion in 64 yrs. 3,525
Hammersmith. — 191, King-st., (S.), f., y.r. 90*l.* 2,500
14 and 16, Elm-gr., u.t. 37 yrs., g.r., etc., 5*l.*, y.r. 56*l.* 505
2 and 4, Flora-gdns., u.t. 41½ yrs., g.r. 4*l.*, w.r. 62*l.* 8s. 500

By MONTAGU HOLMES & SONS.

Commercial-road East.—19, 20, 22 to 26, 35 and 36, Ann-st., u.t. 38 yrs., g.r. 36*l.*, w.r. 280*l.* 16s. 1,525
Kingsland.—59 and 61, Hertford-road (s.), and 35 and 37, Downham-rd., u.t. 16 yrs., g.r. 7*l.* 10s., y.r. 122*l.* 8s. 585
39 to 45 (odd), Downham-rd., u.t. 15 yrs., g.r. 10*l.*, y.r. 136*l.* 615

By HUNTER & HUNTER.

Oxford-street.—Berwick-st., etc., f.g.r. 34*l.*, reversion in 35 yrs. 1,520
Chelsea.—45, Redesdale-st., u.t. 48 yrs., g.r. 2*l.*, y.r. 50*l.* 600
Holloway.—York-rd., l.g. rents 18*l.*, u.t. 38 yrs., g.r. nil 310
Fulham.—16, Cloncurry-st., u.t. 94½ yrs., g.r. 7*l.*, y.r. 42*l.* 475
Dulwich.—16 to 30 (even), Colwell-rd., u.t. 72½ yrs., g.r. 42*l.*, w.r. 209*l.* 6s. 1,600

By E. SIMPSON.

New Cross.—1, Monson-rd., u.t. 71 yrs., g.r. 3*l.* 3s., e.r. 39*l.* 325
Peckham.—79, Lausanne-rd., f., e.r. 36*l.* 400

By WESTON & SONS.

Brixton.—32, Claribel-rd., u.t. 10 yrs., g.r. 5*l.* 5s., y.r. 38*l.* 125
Stockwell.—24, Sidney-rd. (s.), u.t. 676 yrs., g.r. nil, y.r. 42*l.* 610
27, 29, 31, 33, and 35, Sidney-rd., u.t. 35 yrs., g.r. 22*l.* 10s., y.r. 170*l.* 1,585

By J. C. PLATT (at Hammersmith).

Hammersmith.—Upper Mall, "Clare Lodge," u.t. 72½ yrs., g.r. 12*l.* 10s., y.r. 45*l.* 500
Shepherd's Bush.—7 and 9, Davisville-rd., f., y.r. 60*l.* 930

By WEATHERALL & GREEN (at Leighton Buzzard).

Leighton Buzzard, Beds.—44 and 46, North-st. (The Golden Teapot Stores), and 10, 12, and 14, Lammas-st., f., y.r. 170*l.* 2,000

By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).

City of London.—Queen Victoria-st., The "Black Friar" p.h., u.t. 50 yrs., y.r. 150*l.*, with goodwill 31,150

May 18.—By BAXTER, PAYNE, & LEPPER.

Bromley, Kent.—Edward-rd., "Glatney," f., e.r. 120*l.* 2,005
22, Bromley-common, f., e.r. 65*l.* 1,000

By FOSTER & CRANFIELD.

Blackfriars.—42, Stamford-st. (s.), f., y.r. 65*l.* 800

By MARTIN, WHITE, & Co.

Dulwich.—3, Elsie-rd., f., y.r. 36*l.* 525
Bermondsey.—18 and 20, Spa-rd., u.t. 12½ yrs., g.r. 6*l.*, w.r. 57*l.* 4s. 200
Dulwich.—126 and 128, Crystal Palace-rd., u.t. 61 yrs., g.r. 10*l.*, w.r. 75*l.* 8s. 590

By ERNEST OWERS.

Hampstead.—24, Gladys-rd., u.t. 86 yrs., g.r. 10*l.*, e.r. 65*l.* 500

By E. & S. SMITH.

Clerkenwell.—Wilmington-sq., l.g. rents 43*l.*, u.t. 11½ yrs., g.r. 8*l.* 200
Camden Town.—11, Prebend-st., u.t. 17½ yrs., g.r. nil, y.r. 52*l.* 200
Muswell Hill.—36, Muswell-av., u.t. 93 yrs., g.r. 11*l.* 11s., e.r. 65*l.* 650

By R. TIDEY & SON.

Forest Gate.—Huddleston-rd., f.g.r. 9*l.*, reversion in 78 yrs. 235
Hornsey.—64 and 68, Linzee-rd, f., y.r. 76*l.* ... 890
Wood Green.—1 and 2, Braemar-villas, f., y.r. 70*l.* 890

By DOUGLAS YOUNG & Co.

Enfield.—Bush Hill Pk., 30, 32, 36, 40, and 64, Wellington-rd., u.t. 85 yrs., g.r. 52*l.*, y.r. 312*l.* 2,900
42, Lincoln-rd., u.t. 85 yrs., g.r. 11*l.*, y.r. 68*l.* 700
4, Queen Anne's-pl., u.t. 85 yrs., g.r. 10*l.*, y.r. 60*l.* 500
3, Queen Anne's-gdns., u.t. 85 yrs., g.r. 8*l.*, y.r. 52*l.* 520
1 to 81 (odd), 2 to 80 (even), Fifth-av., 1 to 21 (odd), 4 to 76 (even), Sixth-av., u.t. 85 yrs., g.r. 326*l.*, y.r. 2,286*l.* 8s. 11,100
27, First-av., u.t. 85 yrs., g.r. 5*l.*, y.r. 37*l.* 1s. 225

By MADDISON, MILES & MADDISON (at Yarmouth).

Burgh St. Margaret, Norfolk.—A freehold holding, three freehold marshes, 6 a. 0 r. 23 p. 315
11 a. 0 r. 38 p. 670
Potter Heigham, Norfolk.—Two freehold marshes, 12 a. 3 r. 12 p. 140
West Somerton, Norfolk.—Freehold cottage and gdns. 150
Caister, Norfolk.—A freehold rent charge of 5*l.* 10s. 125

By WYATT & SON (at Chichester).

Chichester, Sussex.—14, Orchard-st., f. 105
Bosham, Sussex.—A copyhold house and tenements, y.r. 26*l.* 410

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May 19.—By AUSTIN & AUSTIN.

Leytonstone.—53, Forest Drive West, f., y.r. 40*l.* £560
Kilburn. — 109, Iverson-rd., u.t. 78 yrs., g.r. 7*l.*, y.r. 42*l.* 500
33 and 34, Palmerston-rd., u.t. 60 yrs., g.r. 17*l.* 8s., y.r. 135*l.* 4s. 600
47, Donaldson-rd., u.t. 88 yrs., g.r. 6*l.*, e.r. 40*l.* 380

By BOWDITCH & GRANT.

Caterham, Surrey.—Elgin-cres., "Elgin Villa" and 0 a. 2 r. 28 p., f., p. .....

By BRODIE, TIMBS, & CO.

Highgate.—North-hill, "Gothic Cottage," c., y.r. 28*l.* 700

By CHAS. CANEY.

Brockley.—301, Brockley-rd. (s.), u.t. 58 yrs., g.r. 12*l.* 10s., y.r. 60*l.* 800

By PHILLIPS & HALL.

Bermondsey.—139 and 141, Lynton-rd., u.t. 36½ yrs., g.r. 10*l.*, y.r. 70*l.* 4s. .....

By BLISS & SONS.

Edgware-road.—(Nos. 500, 508, and 510), i.g.r. 40*l.* 10s., u.t. 19 yrs., g.r. 2*l.* 6s. 6d. 790
Whitechapel.—76, Whitechapel-rd. (s.), u.t. 180 yrs., g.r. nil, w.r. 44*l.* 4s. .....
83, King Edward-rd., u.t. 35 yrs., g.r. 1*l.*, e.r. 45*l.* 450
Old Ford.—82 and 84, Ellesmere-rd., f., w.r. 70*l.* 4s. .....
Ellesmere-rd. f.g.r. 6*l.*, reversion in 52½ yrs. 374 and 376, Old Ford-rd., f., w.r. 72*l.* 16s. 400
Old Ford-rd., f.g.r. 6*l.* 6s., reversion in 55 yrs. .....
Caterham, Surrey.—Croydon-rd., 10 plots of building land, f. 165
625

By NEWBON, EDWARDS, & SHEPHARD.

Tottenham.—Lansdowne-rd., two plots of building land, f. .....
Antil-rd., eight plots of building land, f. ... 165
Broad-la., ten plots of building land, f. 480
Bloomsbury.—55, Gloucester-st. (s), f., e.r. 85*l.* 560
Lambeth.—9 to 14, Ward-st., u.t. 5½ yrs., g.r. 25*l.* 4s., y.r. 122*l.* 1,420
Bayswater.—3, Sutherland-pl., u.t. 42 yrs., g.r. 6*l.*, e.r. 45*l.* 200
Canonbury.—32, Spencer-st., u.t. 14½ yrs., g.r. 6*l.*, e.r. 38*l.* 495

By STIMSON & SONS.

Rotherhithe. — Reculver-rd., i.g. rents 15*l.*, reversion in 53 yrs. 125
Dulwich.—Wood-vale, etc., i.g. rents 96*l.*, reversion in 78 yrs. 389
Mile End.—2 and 4, Cleveland-st., u.t. 16 yrs., g.r. 12*l.*, y.r. 75*l.* 10s. 2,700
Old Kent-road.—Dartnell-rd., f.g rents 66*l.*, reversion in 77 yrs. 250
Dulwich.—196, 198, 204, and 206, Barry-rd., u.t. 75 yrs., g.r. 28*l.*, y.r. 126*l.* 1,400
Brixton.—54 to 74 (even), Millbrook-rd. (including the Millbrook Laundry), u.t. 17¾ yrs., g.r. 46*l.* 4s., w.r. 389*l.* 2s. 1,110
Catford.—54, 56, and 58, Faversham-rd., f., y.r. 85*l.* 1,720
Camberwell.—34 to 40 (even), Lothian-rd., u.t. 53 yrs., g.r. 16*l.*, w.r. 137*l.* 10s. 1,005
1,010

By J. A. & W. THARP.

Willesden.—11, Dean-rd., u.t. 76 yrs., g.r. 8*l.*, e.r. 55*l.* .....
Ilford, Essex.—Sylvan-rd., "Beulah Villa" and "Myrtle Cottage," f., w.r. 49*l.* 8s. .. 410
Tyne-rd., "Alpha Villa," f., w.r. 23*l.* 8s. ... 560
225

By BRIDGMAN & SON (at Hoddesdon).

Hoddesdon, Herts.—Lord-st., plot of building land, f. 115
Stanstead-rd., freehold building land, 1 a. 2 r. 0 p. .....
Stanstead-rd., two enclosures of arable, 7 a. 2 r. 0 p., f. 145
Admiral's Walk, enclosure of meadow, 4 a. 0 r. 36 p., f. 700
Lord-street, "Sydney Lodge," f., p. 300
800

By WHEELER & SON (at Sudbury)

Newton, Suffolk.—"Roger's Farm," 106 a. 1 r. 5 p., f. and c. 615

By WHEATLEY & SCRIVEN (at Masons' Hall Tavern).

Hampstead. — North-end, the "Hare and Hounds" p.-h., u.t. 24½ yrs., y.r. 100*l.*, with goodwill .....
May 20.—By F. G. BOWEN. 2,320

South Ockendon, Essex.—"Pear Tree House" and six cottages adjoining, f. .....
Mitcham.—Church-rd., a freehold plot of land 1,200
190

By DAVID J. CHATTELL.

Portman Square.—17, Bryanston-st., u.t. 8½ yrs., g.r. 40*l.*, y.r. 200*l.* .....
Woolwich, Kent. — Rodney-st., freehold wharf and premises, p. 650
290

By HORNBLOWER & FLOWER.

Croydon.—20 and 22, Whitehorse-rd., f. y.r. 84*l.* .....
Thornton Heath.—56 to 68, Princess-rd., u.t. 76 yrs., g.r. 40*l.*, w.r. 218*l.* 8s. 1,160
149 to 159 (odd), Moffatt-rd., u.t. 73 yrs., g.r. 24*l.*, w.r. 140*l.* 8s. 1,470
650

By G. PEARCE & SONS.

Hoxton.—64, Alma-st., u.t. 30½ yrs., g.r. 5*l.*, y.r. 32*l.* .....
Stoke Newington.—26 and 39, Barrett's-gr., u.t. 70 yrs., g.r. 15*l.* 10s., y.r. 74*l.* 315
Hoxton.—59, Grange-st., u.t. 32 yrs., g.r. 5*l.* 5s., y.r. 36*l.* 740
Manor Park.—1, Sheridan-rd., u.t. 93 yrs., g.r. 4*l.* 10s., w.r. 29*l.* 18s. 310
190

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, MAY 27.

Royal Institution.—His Serene Highness Albert Prince of Monaco on "The Progress of Oceanography." 9 p.m.

SATURDAY, MAY 28.

Royal Institution.—Sir W. Martin Conway, M.A., on "Spitsbergen in the XVIIth Century," I. 3 p.m.
St. Paul's Ecclesiological Society.—Visit to Broxbourne.

MONDAY, MAY 30.

Surveyors' Institution.—The Annual General Meeting, to receive the Report of the Council and the announcement of the result of the Election of Officers for the ensuing year. 3 p.m.

TUESDAY, MAY 31.

Royal Institution.—Mr. H. F. Newall, M.A., F.R.S., on "The Solar Corona," II. 5 p.m.

WEDNESDAY, JUNE 1.

Royal Archæological Institute.—(1) Mr. C. R. Peers, M.A., F.R.S., on "The White Monastery, near Sohag, Upper Egypt." (2) Mr. Philip M. Johnston on "The Wall Paintings in Shorthampton Church, Oxfordshire." 4 p.m.
Builders' Foremen's and Clerks of Works' Institute.—Ordinary meeting of the members. 8 p.m.

FRIDAY, JUNE 3.

Royal Institution.—Professor Svante Arrhenius, of Copenhagen, on "The Development of the Theory of Electrolytic Dissociation." 9 p.m.

SATURDAY, JUNE 4.

Royal Institution.—Sir W. Martin Conway, M.A., on "Spitsbergen in the XVIIth Century," II. 3 p.m.
Northern Architectural Association.—Visit to West Hartlepool.
British Institute of Certified Carpenters.—The Annual Dinner, at the Holborn Restaurant. 7 p.m.

TO CORRESPONDENTS.

S. F. H.—A. S.—E. and C. (Amounts should have been stated).—F. W. C. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks.	1 16 0	per 1000	alongside, in river.
Rough Stocks and Grizzles	1 13 0	,,	,, ,,
Facing Stocks ...	2 12 0	,,	,, ,,
Shippers	2 10 0	,,	,, ,,
Flettons	1 10 0	,,	,, ,,
Red Wire Cuts ...	1 13 0	,,	at railway depôt.
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Ruabon Facing	5 0 0	,,	,, ,,
Best Blue Pressed Staffordshire ...	4 4 0	,,	,, ,,
Do. Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 8 0	,,	,, ,,
GLAZED BRICKS.			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats.....	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers...	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamferred, Squints.	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats.....	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers...	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamferred, Squints	14 0 0	,,	,, ,,
Second Quality, White and Dipped Salt Glazed	2 0 0	,,	less than best.

BRICKS, &c.—(*Continued*).

	s. d.		
Thames and Pit Sand.....	7 3	per yard,	delivered.
Thames Ballast.....	6 0	,,	,,
Best Portland Cement	30 0	per ton,	,,
Best Ground Blue Lias Lime	21 0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.	
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	,,	,,
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 1	,,	,,
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 2½	,,	,,
	s. d.		
Ancaster in blocks.....	1 11	per ft. cube,	deld. rly. depôt.
Beer ,, ...	1 6	,,	,,
Greenshill ,, ...	1 10	,,	,,
Darley Dale in blocks...	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
CloseburnRedFreestone	2 0	,,	,,
Red Mansfield ,,	2 4	,,	,,

YORK STONE—*Robin Hood Quality*

	s. d.		
Scappled random blocks	2 10	per ft. cube,	,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super.	,,
6 in. rubbed two sides ditto, ditto	2 6	,,	,,
3 in. sawn two sides slabs (random sizes)	0 11½	,,	,,
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	,,	,,
1½ in. to 2 in. ditto, ditto	0 6	,,	,,
HARD YORK—		,,	,,
Scappled random blocks	3 0	per ft. cube,	,,
3 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super.	,,
6 in. rubbed two sides Ditto	3 0	,,	,,
3 in. sawn two sides (slabs random sizes)	1 2	,,	,,
2 in. self-faced random flags	0 5	,,	,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.	
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt	
,, ,, ,, 3 in. do.	1 2½	,,	,,

SLATES.

in. in.	£ s. d.		
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.	
20 × 12 ,, ,,	13 17 6	,,	,,
20 × 10 first quality ,,	13 0 0	,,	,,
20 × 12 ,, ,, ,,	13 15 0	,,	,,
16 × 8 ,, ,, ,,	7 5 0	,,	,,
20 × 10 best blue Portmadoc	12 12 6	,,	,,
16 × 8 ,,	6 12 6	,,	,,
20 × 10 best Eureka unfading green .	15 17 6	,,	,,
20 × 12 ,, ,,	18 7 6	,,	,,
18 × 10 ,, ,,	13 5 0	,,	,,
16 × 8 ,, ,,	10 5 0	,,	,,
20 × 10 permanent green	11 12 6	,,	,,
18 × 10 ,, ,,	9 12 6	,,	,,
16 × 8 ,, ,,	6 12 6	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles .	42 0	per 1000 at	rly. depôt.
Hip and Valley tiles ...	3 7	per doz.	,, ,,
Best Brosely tiles.....	50 0	per 1000	,, ,,
Do. Ornamental tiles	52 6	,,	,, ,,
Hip and Valley tiles ...	4 0	per doz.	,, ,,
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000	,, ,,
Do. Ornamental do	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 0	,,	,, ,,
Best Red or Mottled Staffordshire do. (Peakes).....	51 9	per 1000	,, ,,
Do. Ornamental do.....	54 6	,,	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,
Best "Rosemary" brand plain tiles.....	48 0	per 1000	,, ,,
Best Ornamental tiles	50 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000	,, ,,
Do. pressed.....	47 6	,,	,, ,,
Do. Ornamental do	50 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 6	,,	,, ,,

WOOD.

	At per standard. £ s. d.		
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0		16 10 0
Deals: best 3 by 4.....	14 10 0		15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0		12 10 0
Battens: best 2½ by 6 and 3 by 6..	0 10 0		less than 7 in. and 8 in.
Deals: seconds	1 0 0		less than best
Battens: seconds	0 10 0	,,	,, ,,
2 in. by 4 in. and 2 in. by 6 in....	9 0 0		9 10 0
2 in. by 4½ in. and 2 in. by 5 in....	8 10 0		9 10 0
Foreign Sawn Boards—			
1 in. and 1½ in. by 7 in.	0 10 0		more than battens.
¾ in.	1 0 0		,,

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WOOD.—(continued).

	At per load of 50 ft. £ s. d.	£ s. d.
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

Joiners' Wood.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" 3 in. by 9 in.	13 10 0	14 10 0
" Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6
Small "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks - per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ...	7 5 0
Compound Girders, ordinary sections	8 2 6 ...	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ...	8 17 6
Flitch Plates	8 5 0 ...	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ...	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
Iron—		
Common Bars	7 5 0 ...	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0 ...	8 5 0
Staffordshire "Marked Bars"	10 0 0 ...	—
Mild Steel Bars	8 15 0 ...	9 5 0
Hoop Iron, basis price	9 5 0 ...	9 10 0
" " Galvanized ("And upwards, according to size and gauge.)	17 10 0 ...	—
Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ...	—
" " 24 g.	10 15 0 ...	—
" " 26 g.	12 5 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ...	—
Ordinary sizes to 22 g. and 24 g.	13 5 0 ...	—
" " 26 g.	14 5 0 ...	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ...	—
" " 22 g. and 24 g.	16 10 0 ...	—
" " 26 g.	18 0 0 ...	—
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0 ...	—
" " 22 g. and 24 g.	13 0 0 ...	—
" " 26 g.	13 15 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0 ...	—
" " 26 g.	14 0 0 ...	—
Cut nails, 3 in. to 6 in. (Under 3 in., usual trade extras.)	9 0 0 ...	9 10 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
Lead—Sheet, English, 3lb. and up	14 12 6 ...	—
Pipe in coils	15 2 6 ...	—
Soil pipe	17 12 6 ...	—
Compo pipe	17 12 6 ...	—
Zinc—Sheet—		
Vieille Montagne ton	27 5 0 ...	—
Silesian	27 0 0 ...	—
Copper—		
Strong Sheet per lb.	0 0 10½ ...	—
Thin " "	0 0 11½ ...	—
Copper nails "	0 0 11 ...	—
Brass—		
Strong Sheet "	0 0 10 ...	—
Thin " "	0 0 11 ...	—
Tin—English Ingots "	0 1 4 ...	—
Solder—Plumbers' "	0 0 6½ ...	—
Tinmen's "	0 0 8 ...	—
Blowpipe "	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¼d. per ft. delivered.
" fourths	1⅝d. " "
21 oz. thirds	3¼d. " "
" fourths	2⅜d. " "
26 oz. thirds	4d. " "
" fourths	3½d. " "
32 oz. thirds	5d. " "
" fourths	4½d. " "
Fluted Sheet, 15 oz.	3d. " "
" 21 oz.	4d. " "
⅛ Hartley's Rolled Plate	1⅜d. " "
¼ " " "	1⅝d. " "
½ " " "	2⅜d. " "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 5
" " in drums	"	0 1 8
Boiled " in pipes or barrels	"	0 1 8
" " in drums	"	0 1 11
Turpentine, in barrels	"	0 3 7
" in drums	"	0 3 9
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	"	19 0 0
Best Linseed Oil Putty	per cwt.	0 6 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

PUBLISHER'S NOTICES.

Nat. Tel., 6112, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXV. (July to December, 1903) was given as a supplement with issue of January 9 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each: also

READING CASES (Cloth), with Strings, price 9d. each.

THE EIGHTY-FIFTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, &c., &c.

Six lines, or under ..... 6s. 0d.
Each additional line ..... 1s. 0d.

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Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

. Stamps must not be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE noon on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS advertising in "THE BUILDER" may have *Replies addressed to the Office*, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERGAVENNY.—For erecting four cottages in Lower Monk-street, for Mrs. Dodd. Mr. F. Baldwin, architect, 13, Frogmore-street, Abergavenny:—

W. C. Forward	£850 0 0	J. A. Price	£700 0 0
J. Williams	799 16 0		

BRAY.—For erecting forty-four workmen's cottages at Little Bray, for the Urban District Council. Mr. C. H. N. Sutter, Architect and Surveyor to the Council, Town Hall, Bray, Ireland. Quantities by Mr. W. Butler, Dublin:—

S. Worthington, Sandymount* £4,846

BRAY.—For erecting ten workmen's cottages adjacent to the Town Hall, for the Urban District Council. Mr. C. H. N. Sutter, Architect and Surveyor, Town Hall, Bray, Ireland. Quantities by Mr. W. Butler, 58, Mountjoy-square, Dublin:—

S. Worthington, Sandymount* £1,607

BRIGHTON.—For alterations and repairs and redrainage to Finsbury-road School, for the Education Committee. Messrs. T. Simpson & Son, surveyors, 17, Ship-street, Brighton:—

G. R. Lockyer	£3,824	W. Taylor	£3,462
Rowland Bros.	3,699	W. Olliver	3,375
Foster Bros.	3,555	J. & W. Simmonds, Ashford-road, Brighton‡	3,295
Cook & Sons	3,550		
J. Barnes	3,447		

‡ Recommended for acceptance.

CARDIFF.—For painting and renovating the interior of three ward pavilions at the Sanatorium, for the Corporation. Mr. W. Harpur, Borough Engineer, Town Hall, Cardiff:—

Gough Bros., Cardiff* £201

CWMMILES.—For erecting a stone bridge at Cwmmiles, near Login, Carmarthenshire, for the Whitland Rural District Council. Mr. D. E. Thomas, architect, Victoria-place, Haverfordwest:—

J. Rees & Sons	£910 0
D. Howell & Son, Llandowror, St Clears*	749 10

DEVONPORT.—For pulling down and rebuilding the White Lion public-house, King-street and Cannon-street, for Mr. W. Ford. Mr. Edgar M. Leest, architect, 14, St. Aubyn-street, Devonport. Quantities by Messrs. Leest & Adams, Devonport:—

Axworthy	£1,549 10 7	Stanbury	£1,340 0 0
G. H. Smith & Son	1,498 15 0	T. Jenkin & Son	1,333 0 0
Blake & Son	1,390 0 0	T. May	1,318 0 0
J. H. Palmer	1,355 0 0	Pearce Bros., Plymouth*	1,299 0 0
F. Watts	1,349 10 0		
Partridge	1,349 0 0		

DROITWICH.—For gas engine and vertical treble-ram pumping plant, etc. (Specification No. 2, Outfall Works), for the Corporation. Mr. H. Hulse, Borough Engineer, Droitwich:—

A. Dougill's Engineering Co., Ltd., Leeds* £626 15

DROITWICH.—For outfall works, etc. (Specification No. 1), for the Corporation. Mr. H. Hulse, Borough Engineer, Droitwich:—

J. Byard & Sons, Gloucester* £1,135 16

GREAT CROSBY.—For carriageway and footways, Bonds-lane, for the Urban District Council. Mr. Watkin Hall, Surveyor to the Council, College-road, Great Crosby:—

P. Balmer, Aintree, Liverpool £590 0 0

For Roadworks, Cook's-lane (kerbing, channelling, and flagging footway).

T. & J. Ellams, Great Crosby £73 6 10

For Roadworks, Alexandra-road (flagging footways).

J. & J. Gilbertson, Great Crosby £19 17 0

GREAT CROSBY.—For flagging back passages, Shaftesbury-road, for the Urban District Council. Mr. Watkin Hall, Surveyor to the Council, College-road, Great Crosby:—

P. Balmer, Aintree, Liverpool £140

[Alternative Tender if Council supply flags £80.]

HEREFORD.—For alterations and renovations at Herefordshire Training College for Women, for the Training College Committee of Herefordshire Education Authority. Mr. A. Dryland, County Surveyor, Shire Hall, Hereford. Quantities by architect:—

	A	B	C
E. W. Wilks	£268 0 0	£860 0 0	£468 0 0
W. Rowberry	232 14 10	805 1 3	551 4 11
Beavan & Hodges	258 0 0	847 0 0	453 10 0
T. Broad	255 0 0	696 0 0	588 0 0
J. C. Vaughan, Hereford*	237 18 11*	666 2 9*	544 1 9
Bolt, Davies & Co.*	220 0 0	— — —	430 0 0*

A. Builder's work. B. Decorator, plumber, slating, engineer, etc. C. Extensions—all trades.

LLANISHEN.—For additions to Llanishen and Lisvane National Schools. Mr. H. D. Blessley, architect, 22, Trinity-street, Cardiff. Quantities by architect:—

A. J. Howell	£636 0 0	S. Hanson	£545 0 0
C. Beams & Nephew	610 0 0	Blacker Bros., Clive-road, Cardiff*	520 0 0
Gough Bros.	586 0 0	S. E. Williams	510 0 0
A. W. Cadwallader	568 14 6		

TENDERS—*Continued on page* 596.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
Church, John-street, Glasgow	Corporation of Glasgow	Not stated	No date.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Tarring Dalmarnock Bridge, etc.	Joint Bridges Committee, Glasgow	T. Nisbet, Master of Works, City Chambers, Glasgow	May 28
Covered Bridge	do.	M. Nisbett, Architect, 122, George-street, Edinburgh	May 30
Fire Alarm Apparatus at Provided Schools	Tottenham Education Committee	W. H. Prescott, A.M.I.C.E., Coombes Croft Hse, 712, High-rd., T'ham	do.
Alterations, etc., Abbey Town School	Committee of Management	Oliver & Dodgshun, Architects, Carlisle	do.
Bakery, Cart House, etc., Meadow-st., Pontycymer	Industrial Co-operative Society	W. Thomas, Secretary, Pontycymer Stores	do.
Forty Fathoms of Baltic Yellow Deal, etc.	Dartford Guardians	J. C. Hayward, Clerk, Union Offices, Dartford	do.
Stoneware Pipes (Seconds) for Land Drainage	Edmonton U.D.C.	G. Eedes Eachus, Engineer, Town Hall, Edmonton	do.
525 Yards of Kerbing	Royston U.D.C.	J. Raley, Solicitor, Barnsley	do.
780 Yards of Channelling	do.	do.	do.
Cement'g Playgrounds, etc., Carville Sch'ls, Wallsend	Wallsend Corporation	G. Hollings, Borough Surveyor's Office, High-street, Wallsend	do.
Cementing Footpaths, Hunter's-road, Wallsend	do.	do.	do.
Extension of Outfall Sewer in River Tay	Dundee Town Council	W. Mackison, C.E., Municipal Offices, 91, Commercial-st., Dundee	do.
Shops, Market-street, Wigan	Sir F. S. Powell, Bart.	Heaton, Ralph, & Heaton, Architects, Wigan	do.
Street Watering Van	Clacton-on-Sea U.D.C.	Surveyor, Town Hall, Clacton	May 31
Removing 9,000 Cubic Yards of Earth, Thornley	Weardale Steel, etc., Co.	Colliery Office, Thornley Colliery	do.
Private Street Works	Guildford Town Council	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford	do.
Additions, etc., to Cragg Hall, Mytholmroyd	.....	Empsall & Clarkson, Architects, Exchange-buildings, Bradford	do.
Painting Pine End of Welsh Baptist Chapel, Bedwas	.....	Mr. Lewis Miles	do.
Electric Light Installation, etc., Kingston Halls	Glasgow Corporation	A. B. M'Donald, City Engineer, 64, Cochrane-street, Glasgow	do.
Gates and Railings at New Cemetery	Hamilton Parish Council	J. B. Brodie, C.E., 136, Wellington-street, Glasgow	do.
Sixty Fathoms Swedish Yellow Deals, etc.	Eton Guardians	R. H. Barrett, Clerk, Slough, Bucks.	do.
Street Paving, Eaglescliffe	Stockton R.D.C.	J. Rodham, Surveyor, Finkle-street, Stockton-on-Tees	do.
Street Paving, Preston-on-Tees	do.	do.	do.
Additions to Shotton Colliery Stores	Sherburn Hill Co-operative Society	J. Walton Taylor, F.R.I.B.A., St. John-street, Newcastle	do.
Stores	Middlesbrough Corporation	A. Sockett, Town Clerk, Municipal-buildings, Middlesbrough	do.
Earthenware Pipes, etc.	Ashton-in-Makerfield U.D.C.	H. Niven, Engineer and Manager, Gas Works, Ashton	do.
Supplies, Waterworks Department	do.	do.	do.
Supplies, Gasworks Department	do.	do.	do.
Repaving Part of John-street, etc.	Crewe Town Council	G. Eaton-Shore, Borough Surveyor, Crewe	do.
Alterations, etc., to Castle View, Passage West, Cork	Dr. Beamish	W. H. Hill & Son, Architects, 28, South Mall, Cork	do.
Repairs, etc., at Court Henry Council School	Carmarthenshire County Council	W. D. Jenkins, County Education Architect, Llandilo	do.
Four Houses and Shop at Beamish, near West Pelton	.....	T. E. Crossling, Architect, Front-street, Stanley, R.S.O.	do.
Business Premises, Beamish, near West Pelton	.....	do.	do.
Two Houses at Bryncethin	Mrs. Rideout	J. Hurley, Architect, 10, Bridgen-road, Aberkenfig	do.
Alterations, Bodkin Ho., Otterburn, Northumberland	.....	J. Hartley, Architect, Skipton	do.
Repairing Tar Paving in Station-road	Steyning West R.D.C.	Office of Surveyor, High-street, Steyning	do.
Second Barn Flags and Grit Curbs	Manchester Tramways Committee	J. M. M'Elroy, Tramways Department, 55, Piccadilly, Manchester	do.
Shelter Hall, Western Lawns	Hove Corporation	H. H. Scott, Borough Surveyor, Town Hall, Hove	June 1
*Supply of Portland Cement and Flints	do.	do.	do.
Iron Fencing at Electric Light Station, Pier's-road	Handsworth U.D.C.	H. Richardson, Surveyor, Council House, Handsworth	do.
5-Ton Overhead Manual Travelling Crane	Blackpool Corporation	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
Paving Boal-street	King's Lynn Corporation	H. J. Weaver, Borough Surveyor, King's Lynn	do.
Street Works, Aldred-street, etc.	Failsworth U.D.C.	Surveyor's Office, Town Hall, Failsworth	do.
2,490 Tons of Steel Rails and Plates	Federated Malay States Railway	Crown Agents for Colonies, Whitehall-gardens, S.W.	do.
22 Tons Fish Bolts and Nuts, etc.	do.	do.	do.
Iron Fencing, etc.	Rathdown No. 1 R.D.C.	R. M. Butler, C.E., 12, Dawson-street, Dublin	do.
Station-road Paving	Stainland with Old Lindley U.D.C.	J. H. Walker, Surveyor, Council Office, Mechanics Hall, Stainland	do.
Painting Outside Woodwork at Workhouse	Wellington (Salop) Guardians	J. Jones, Clerk, Edgbaston House, Wellington	do.
Scavenging Work	Blaydon U.D.C.	R. Biggins, Sanitary Inspector, Offices of Council, Blaydon-on-Tyne	June 2
Steam Piping, etc., at Electricity Works	Batley Corporation	Borough Electrical Engineer, Batley	do.
Rebuilding Ship Inn, Portloe, Cornwall	.....	T. H. Andrew, Architect, 1, Trevarrick-villas, St. Austell	do.
Wesleyan Sunday School B'dings, Reepham, Norfolk	.....	Mr. Gibbs, Ironmonger, Reepham, Norfolk	do.
Fever Hospital at Wicklow	Hospital Committee	Patterson & Kempster, 95, Lower Leeson-street, Dublin	do.
Dispensary Residence, Ballyclough, Mallow	The Guardians	Clerk of Works, Bd. Room of Grdns., Ballyclough, Mallow, Irel'd	do.
Furnishing New Probationary House	Ipswich Guardians	J. H. Wild, Clerk, 19, Tower-street, Ipswich	do.
Additions, etc., to Laundry, St. John's Home	do.	H. J. Wright, Architect, 4, Museum-street, Ipswich	do.
*Laying Down Surface Water Drains	Kingston-on-Thames Corporation	Borough Surveyor, Municipal Offices, Kingston-on-Thames	do.
Painting and Distempering Council Schools	Bootle Corporation	Borough Engineer's Office, Town Hall, Bootle	June 3
Oak Fencing and Gates, Tanners-lane, Barkingside	Ilford U.D.C.	H. Shaw, Surveyor, Public Offices, Ilford, Essex	do.
Repairs to Schools, Upton Park	St. George-in-the-East Guardians	J. R. Browne, Clerk, Raine-street, Old Gravel-lane, E.	do.
Walls, Toolhouses, etc., Brierylaw Cemetery	Selkirk Parish Council	G. Somervel Carfrae, C.E., 1, Erskine-place, Edinburgh	do.
Chancel, St. Cuthbert's Church, Hebburn-on-Tyne	.....	M. Temple Wilson, Architect, Alnwick	do.
Waterworks, Harlech	Dendraeth R.D.C.	Foster & Co., Engineers, Portmadoc	do.
Alterations, etc., Sacriston Stores	Annfield Plain Co-operative Society	G. T. Wilson, Architect, 21, Durham-road, Blackhill	do.
Alterations, etc., Dipton Stores	do.	do.	do.
*Drainage to Four Houses, Bexley Heath	Foresters' Asylum Committee	Mr. Atlee, Foresters' Asylum, Bexley Heath	do.
Two Dwelling Houses, etc., Stowe-street	Trustees of Milley's Hospital	W. Perry, 39-41, Bore-street, Lichfield	June 4
Shopfront, etc., Bird-street, Lichfield	do.	do.	do.
Rebuilding King William IV., Brynmawr	T. Edwards	T. Roderick, Architect, Glebeland, Merthyr Tydfil	do.
Plastering, etc., at Griffin Hotel, Brynmawr	do.	do.	do.
Alterations at Royal Arms, Brynmawr	do.	do.	do.
Repairing, etc., the Clarence Hotel, Brynmawr	do.	do.	do.
Repairing, etc., the Rock Inn, Blackwood	do.	do.	do.
Alterations, etc., to Scion Baptist Chapel, Maerdy	Messrs. Buchan & Co.	R. Owen, 63, Griffiths-street, Maerdy, Glam.	do.
Repairs to Council Schools, Moulton	.....	A. E. Thomas, Verdin Technical Schools, Northwich	do.
Painting & Decoratg. Moulton, Schools, nr. Northwich	.....	do.	do.
Colliery Timber	.....	J. R. Lambert, South Hetton, Sunderland	do.
Stores	South Hetton Coal Co.	E. H. Clark, Stores, Gateshead	do.
Telegraph Stores	N.E. Ry. Co.	C. H. Ellison, Company's Telegraph Superintendent, York	do.
Rebuilding the Builder's Arms Hotel, etc.	do.	J. Cook Rees, Architect, Neath	do.
Five Cottages, Old-road, Melincrythan	Mr. E. Evans Bevan	do.	do.
Two Cyclone Dust-collecting Plants	do.	J. M. M'Elroy, Tramways Department, 55, Piccadilly, Manchester	do.
Bolts, Nuts, Screws, Nails, Washers, etc.	Manchester Tramways Committee	do.	do.
9-in. Sewer at Sleetburn	do.	Surveyor's Office, High-street, Langley Moor	do.
Villa Residence in Deer Orchard, Cockermouth	Brandon and Byshottles U.D.C.	J. Fleming, 2, Corn-market, Cockermouth	do.
Paving and Flagging Streets	.....	City Engineer's Office, Municipal-buildings, Leeds	do.
Larne Waterworks Extension	Leeds Corporation	W. G. Younge, Clerk, Town Hall, Larne	June 6
Fifty-five Spans of 10 ft. Bridgework	Larne U.D.C.	76, Gresham House, Old Broad-street, E.C.	do.
Ninety-three Spans of 20 ft. Bridgework	Burma Railways Co., Ltd.	do.	do.
	do.		

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Girder Bridges	Bengal N.W. Ry. Co.	237, Gresham House, Old Broad-street, E.C.	June 6
Cast Crossings, etc.	Southampton Corporation	J. A. Crowther, Borough Engineer, Municipal Offices, Southampton	do.
Pipes and Castings	Fylde Water Board	W. Wearing, Engineer, 34, Victoria-street, Blackpool	do.
Dinnington Main Colliery Branch, Sidings and Works	S. Yorkshire Joint Line Committee	R. Elliott Cooper, 8, The Sanctuary, Westminster, S.W.	do.
River Wall, etc., on River Alyn, Mold	Alyn Steel Tinplate Co.	S. Evans, City Engineer and Architect, County-buildings, Mold	do.
Tak'g D'n, Removal, & Rebuilding Smallpox Hospital	Newburn U.D.C.	T. Gregory, Surveyor, Council Offices Newburn	do.
Flush Tank Cart	Warrington Paving Committee	Borough Surveyor, Town Hall, Warrington	do.
Recasting Bell at Cemetery Chapel	Warrington Cemetery Committee	do.	do.
Whitewashing Markets	Warrington Markets Committee	do.	do.
Station-master's House at Malahide	Gt. Northern Railway Co. (Ireland)	W. H. Mills, Engineer, Amiens-street Terminus, Dublin	do.
Road Materials	Fareham R.D.C.	Clerk, Union Offices, West-street, Fareham	do.
Reconstruction of Sea Walls, Goldcliff	Monmouthshire Comm'rs. of Sewers	T. Rees, Engineer, Corn Exchange-chambers, Newport	do.
Alterations, etc., Court Hall, Monkton	.....	E. H. Harbottle & Son, Architects, County-chambers, Exeter	do.
Outbuildings, Cloakrooms, and Infants' Room	Gillingham Hall Non-prov'd. Schools	A. Pells, F.S.I., Architect, Beccles	do.
*9,000 yds. Filtering Material, Earlswood Sewage W'rks	Borough of Reigate	Borough Engineer, Municipal-buildings, Reigate	do.
Making-up Private Streets	Leyton U.D.C.	W. Dawson, Surveyor, Town Hall, Leyton	June 7
Sewer, Union-road and Downsell-road	do.	do.	do.
Extensions to Central Premises	Boldon Industrial Corporation Soc.	Vaux & Mark, Architects, 66, John-st., Sunderland	do.
Sinking a Well, etc., Stirchley	King's Norton & Northfield U.D.C.	A. W. Cross, A.M.Inst.C.E., 23, Valentine-rd., King's Heath	do.
Road Improvements, Knowsley-road, etc.	Bootle Corporation	Borough Engineer's Office, Town Hall, Bootle	do.
Alterations, Castle Church, Egremont	.....	J. Cowan, Architect and Surveyor, Egremont, Cumberland	do.
*Making-up Roads	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	do.
*Tar and Asphalte Paving Repairs	do.	do.	do.
*Inverting, etc., Moselle Brook	do.	do.	do.
*New County Court and Offices, Croydon	Commissioners of H.M. Works, etc.	Collector, Inland Revenue Office, Croydon	do.
*Asphalte Paving Portion of Hornsey-road	Metropolitan Borough of Islington	Borough Engineer, Town Hall, Upper-street, N.	do.
525 Tons of Broken Granite	Raunds U.D.C.	T. Yorke, Engineer & Surveyor, Raunds	June 8
560 Tons of Slag	do.	do.	do.
*Additional Story, Mat. W'ds., U. Edmonton W'khouse	Edmonton Union	T. E. Knightley, 106, Cannon-street, E.C.	do.
*Extension of Town Hall	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.	do.
Exten. of Club Premises, Lilycroft-rd., Manningham	.....	G. A. Firth, Architect, 9, Spring-gardens, Heaton, Bradford	June 9
Fifty Houses at Glyncorrwg, Cymmer, R.S.O.	Glyncorrwg Colliery Co.	T. Gibbs, Architect, Post Office-chambers, Port Talbot	do.
Wesleyan Methodist Church, Carukil, Redruth	Trustees	Sampson Hill, Architect, Green-lane, Redruth	do.
Classroom, etc., St. James' School, Hereford	.....	Nicholson & Hartree, Architects, Hereford	June 10
*New Coastguard Buildings at Leven, Fife	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
Schools for 780 Children, Newport-road	Aldershot U.D.C.	F. C. Uren, C.E., Municipal-buildings, Aldershot	June 11
Infirmary, Exeter City Workhouse	Exeter Guardians	R. M. Challice, Architect, 14, Bedford-circus, Exeter	do.
Eight Houses at Stainland	.....	C. F. L. Horsfall & Son, Lord-street-chambers, Halifax	do.
Addit'ns, etc., Wesleyan Meth't Ch., Mitchell, Cornwall	.....	Sampson Hill, Architect, Redruth	do.
Steam Boilers at Granton Gasworks	Edinburgh Gas Commissioners	W. R. Herring, M.Inst.C.E., New-street Works, Edinburgh	June 13
Bridge over the River Wye at Brockweir	Bridge Committee	S. W. & A. L. Yockney, Eng'rs, 53, Victoria-st., Westminster, S.W.	do.
1,700 Tons of Granite	Plomesgate R.D.C.	T. Waller Read, Clerk, Board Room, Wickham Market	do.
500 Yards of Kent Ragstone	do.	do.	do.
*Erection of Bridge and Road Diversion Works	Erith U.D.C.	District Council Offices, Erith, Kent	do.
*Additions, etc., to Electric Light Station	do.	W. Egerton, 12, Queen's-road, Erith	do.
*Main Drainage Works	Esher and Ditton U.D.C.	Council's Engineer, Portsmouth-road, Thames Ditton	do.
*Workmen's Cottages and Making-up Rowsley-avenue	Hendon U.D.C.	Council's Engineer, Council Offices, Hendon, N.W.	do.
Extensions, etc., to Workhouse, Tredegar	Bedwellty Guardians	James & Morgan, Architects, Charles-street-chambers, Cardiff	June 14
Abbots Kerswell Water Supply	Newton Abbot R.D.C.	F. Horner, Clerk, Council Offices, Newton Abbot	do.
*Reconstruction of Bridges, etc.	Kent County Council	F. W. Ruck, County Architect, Maidstone	do.
*Additions to Technical Schools	Southend-on-Sea Corporation	Town Clerk, Southend-on-Sea	do.
*Additions, etc., Sewage Pumping Station & C.I. Sewer	Winchester Town Council	City Surveyor, Guildhall, Winchester	June 15
Library and Institute at Rhymney, Mon.	Workmen's Library	J. Llewellin Smith & Davies, Architects, Aberdare	June 16
Schoolrooms at Trecynon, Aberdare	Trustees of English Wesleyan Church	do.	do.
*New Coastguard Detachment, Speeton, Yorkshire	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.	June 17
*New Coastguard Buildings, Prawle Point, S. Devon	do.	do.	do.
12-Ton Compound Steam Road Roller	East Ashford R.D.C.	H. Hamilton, Clerk, 11, Bank-street, Ashford, Kent	June 20
Drainage, Waterloo-place School, Hastings	Education Committee	C. A. Pigott, Architect, Saxon-chambers, London-rd., St. Leonards	do.
*Small Bridge at Rhydyllwyfar, Llanover	Abergavenny R.D.C.	J. Gill, Surveyor, 4, Brecon-road, Abergavenny	do.
*Cleansing, Repair, and Painting of Schools	C.B. of West Ham Education Com.	William Jacques, A.R.I.B.A., 2, Fen-court, Fenchurch-street, E.C.	do.
*Cleaning Windows	do.	do.	do.
*Elec. Wir'g & Fit'gs, West Ham Pk. Schools, Stratford	do.	do.	do.
Covered Service Reservoir at Watnall	Nottingham Water Committee	S. Moore, Water Offices, St. Peter's-square, Nottingham	June 21
Covered Service Reservoir at Ramsdale Hill	do.	do.	do.
*Painting and Decorating Hoxton Public Library	Shoreditch Borough Council	Council's Surveyor, Town Hall, Old-street, E.C.	do.
Free Library, Corporation-street, Taunton	Taunton Corporation	G. H. Kite, Town Clerk, Municipal Offices, Taunton	June 22
*Enlargement of Schools	Wimbledon U.D.C.	The Clerk, Council Offices, Wimbledon, S.W.	June 23
Private Street Works	Levenshulme U.D.C.	J. Jepson, Guardian-chambers, Tiviot Dale, Stockport	June 24
Extension of North Pier, etc., Roundstone, Galway	Office of Public Works, Dublin	H. Williams, Secretary, Office of Public Works, Dublin	do.
Breakwater and Cattle Slip, Cleggan, co. Galway	do.	do.	do.
Extension of Old Pier, Kilronan, co. Galway	do.	do.	do.
*River Wall and Embanked Wharf, Belvedere-rd., S.E.	Borough of Lambeth	Henry Edwards, C.E., 346, Kennington-road, S.E.	June 30
Painting Premises at Prudhoe	.....	West Wylam and Prudhoe Co-operative Society Offices, Prudhoe	No date.
Fireproof Floors, Staircases, etc., Carlisle	Her Majesty's Theatre Directors	J. F. H. Harriman, Architect, 23, Castle-street, Carlisle	do.
Brickwalling, etc.	do.	do.	do.
Twelve Houses, Greystone-road, Carlisle	Mr. J. Little	J. Slack, Architect, 18, Bank-street, Carlisle	do.
School for 400 Boys	Hereford Education Authority	T. Lewis, Clerk, Hereford	do.
Additions to "The Enterprise," Farnborough	Lieut.-Col. Carlyon	Tredenham Lodge, Alexandra-road, Farnborough	do.
Pulling Down Part of "Field Place," Compton	.....	W. G. Lower, Architect, 12A, High-street, Guildford	do.
Small Farmhouse, Little Green, Kingsland	.....	E. L. Wallis, Solicitor, Hereford	do.
Four Houses, Pitsmoor, Sheffield	.....	R. Mitchell, 17, Haymarket-chambers, Sheffield	do.
C.I. and Steel and Concreter Work at stores	Meltham Industrial, etc., Society	W. Carter, Architect, Station-street, Meltham, near Huddersfield	do.
Five Houses in Allen-road, Urmston	.....	G. Westcott, Architect, 11, King-street West, Manchester	do.
Rebuilding the Coach and Horses, Nessgate, York	.....	Bromet & Thorman, Architects, Tadcaster	do.
Wesleyan Chapel, Bony Lodge, Barton-on-Humber	.....	Mr. Beacock, Wesley Chapel, Barton-on-Humber	do.
*Painting, etc., Royal Artillery Barracks, Weedon	War Office	Royal Engineer Office, Colchester	do.
Alterations to Latrines at Schools	Newcastle-on-Tyne Education Com.	A. Goddard, Sec., Education Offices, Northumberland-rd., Newcastle	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of the Works	Banbury Education Committee	Not stated	June 1
*Clerk of Works	All Saints Ch. (Hertf'd) Bldg. Com.	3*l.* 3s. per week	June 2
*Clerk of the Works	Daventry R.D.C.	2*l.* 10s. per week	do.
*Measuring Clerk	Camberwell Borough Council	140*l.*	do.
*Draughtsman	Straits Settlements Government	300*l.*, etc.	June 7
*Head of Engineering Department	Northern Polytechnic	275*l.*	June 8
*Teacher of Cookery	do.	110*l.*	do.
*Teacher of Architectural Drawing	do.	Not stated	do.
*Teacher of Brickwork	do.	Not stated	do.
*Surveyor of Highways	Croydon R.D.C.	400*l.*	June 9

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, —. *Contracts*, lv. vi. viii. x. xii. *Public Appointments*, xviii.

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TENDERS.—*Continued from page 593.*

LEATHERHEAD.—For road improvements, part of Kingston main road, for the Urban District Council. Mr. T. Salkield, Engineer and Surveyor, Council Offices, Leatherhead:—

	A.	B.	
T. W. Pedrette	£4,442	£296	£4,738
B. Cooke & Co.	4,421	298	4,719
G. Wimpey & Co.	4,425	253	4,678
Cunningham, Forbes, & Co.	4,421	209	4,630
T. Adams	4,247	269	4,516
S. Kavanagh & Co.	4,189	250	4,439
A. T. Catley	3,815	230	4,045
T. Free & Sons	3,642	358	4,000
E. Iles	3,685	250	3,935
J. May*	3,650	222	3,872

A. Kingston-road improvement. B. Randall-road corner.

LONDON.—For forming and paving as a new street portion of Invicta-road, for the Greenwich Borough Council:—

H. Woodham & Sons	£429 0 0
Fry Bros.	401 16 0
A. E. Etheridge (trading as J. E. Etheridge)	384 7 0
J. Mowlem & Co., Ltd.*	349 0 0

LONDON.—For painting, distempering, general repairs, etc., at Infirmary, Fulham-road, S.W., for the Guardians of St. George's Union. Mr. W. H. Chappell, clerk of the works:—

B. E. Nightingale	£1,045	0 0	
Vigor & Co.	1,020	0 0	
J. J. Richards	989	0 0	
F. W. Harris	975	0 0	
P. McCarthy	914	0 0	
R. Woolaston & Co.	882	0 0	
Holliday & Greenwood, Ltd.	£840	0 0	
J. Scott Fenn	798	15 0	
G. McArthur	789	0 0	
Wontner & Co., Ltd.	717	0 0	
M. McCarthy, King's-road, Clapham*	687	0 0	

LONDON.—For providing and laying new fire mains, hydrants, etc., at the St. John's-road Workhouse, Upper Holloway, N., for the Guardians of the Poor of the parish of St. Mary, Islington. Mr. William Smith, architect, 65, Chancery-lane, W.C.:—

Simmons	£3,828	Wenham & Waters	£1,610
Beason	1,897	Blakeborough & Sons	1,572
Merryweather	1,798	Harding & Son*	1,524
May	1,793		
Richmond	1,767		

LONDON.—For forming and paving as a new street St. George's-road, for the Greenwich Borough Council:—

H. Woodham & Sons	£537 0 0
Fry Bros.	503 1 8
A. E. Etheridge (trading as J. E. Etheridge)	497 4 5
J. Mowlem & Co., Ltd., of Grosvenor Wharf, Westminster*	475 0 0

LONDON.—For paving works, for Westminster City Council. Mr. J. W. Bradley, C.E.:—

Wood Paving.

Acme Wood Flooring Co.
Wm. Griffiths & Co., Hamilton House, Bishopsgate-street Without*
Improved Wood Pavement Co., Queen Victoria-street*
Mowlem & Co., Ltd., Grosvenor Wharf, Westminster*
} Schedule of Prices.

Asphalte Paving.	Per sq. yd.
Brea Asphalte Co.	13/8
French Asphalte Co.	11/- to 12/-
Limmer Asphalte Co.	11.6 to 13 -
Trinidad Lake Asphalte Co., Laurence Pountney Hill*	10 6 to 11/6
Val de Travers Asphalte Co.	11/3 to 12 6

LONDON.—For painting, cleaning, redecorating, and sundry repairs to South Branch Library, Wandsworth Bridge-road, for the Fulham Borough Council. Mr. F. Wood, Borough Engineer, Town Hall, Fulham:—

The tender of the Borough Surveyor for £190 17s. 6d. was accepted.

NEW TREDEGAR.—For lowering road near Old Whiterose stable, for Bedwellty Urban District Council. Mr. J. H. Lewis, Surveyor, Blackwood, Mon.:—

W. Lewis, Cefn-road, Brithdir, near Cardiff £145 16 9

PLYMSTOCK.—For laying sewer pipes and constructing tanks and outfall works at Lower Hooe, for Plympton St. Mary Rural District Council. Mr. F. A. Clark, Engineer, 83, Old Town-street, Plymouth:—

J. Budge, 24, High-street, Stonehouse, Devon, £774.

SHERINGHAM.—For premises for the Sheringham Co-operative Society. Mr. T. Inglis Goldie, architect, Norwich and Sheringham:—

T. Gill	£697 0	W. Porter	£563 6
G. A Lines	595 0	H. Bullen	550 0
Girling & Smith	588 0	G. Riches	549 0
J. W. Weston	575 2	C. A. Sadler, Sheringham*	497 0
A. S. Lincoln	569 0		

[Architect's estimate, £550.]

SHREWSBURY.—For alterations and additions at Shrewsbury Borough Technical School, Abbey Foregate, for the Borough Council. Mr. W. Chapple Eddowes, Borough Surveyor, The Square, Shrewsbury:—

G. Bullock, Shrewsbury* £197

TORMARTIN (Chippenham).—For work at Tormartin Rectory, for the Rev. T. J. Bowen. Mr. C. E. Ponting, Diocesan Surveyor, Marlborough:—

R. Wilkins & Sons	£787	0 0	
W. Cowlin & Son	505	0 0	
Highman Bros	£496	16 0	
Orchard, Tormartin*	475	0 0	
Webb	350	0 0	

TOTTENHAM.—For making-up Hendrick's-terrace, for the Urban District Council. Mr. W. H. Prescott, Engineer, Coombes Croft House, 712, High-road, Tottenham:—

E. Frost	£296	8 5	
T. Adams	281	3 10	
C. Bloomfield	280	1 5	
Grounds & Newton	£268	8 6	
E. T. Bloomfield*	255	13 7	

[All of Tottenham.]

TREDEGAR.—For erecting thirty four houses, for the United Building Society. Mr. W. S. Williams, architect, Tredegar:—

W. Owen, Walter-street, Tredegar, £180 each for thirty-four houses.

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Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co.

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ILLUSTRATIONS.

Sculptured Fragments from the Ara Pacis Augustæ, Rome.....From Photographs.
Dominion of Canada Emigration Offices.....Mr. A. H. Hart, A.R.I.B.A., Architect.
House, Eglinton Drive, Glasgow .....Mr. A. N. Prentice, F.R.I.B.A., Architect.
Business Premises, Holborn .....Mr. W. C. Waymouth, A.R.I.B.A., Architect.
"Dalguire," Harrogate .....Mr. F. W. Bedford, F.R.I.B.A., Architect.
Stables, "Brahan," Perth.....Messrs. Bedford and Kitson, Architects.

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The New Belfast Cathedral.

THE new Cathedral for Belfast, of which the nave and aisles only are now built and roofed in, is an interesting example of an attempt to build a modern cathedral which should combine primitive Christian tradition with practical suitability for its modern purpose. We have as yet had no attempt of this kind in England. The Cathedral at Truro and the intended new Liverpool Cathedral are both entirely mediæval in their style and the lines of their plan, though the design for Liverpool presents some features which are original. These however are simply architectural, and have no relation to the ritual plan, which is wholly mediæval.

This treatment of the Belfast Cathedral has been, however, only a happy second thought, prompted partly by the practical difficulties in the way of realising a cathedral of the mediæval type on a large scale. It was the first intention of the promoters to procure an ideal site in the centre of Belfast; but at the present price of land in the growing city, now numbering 360,000 inhabitants, such a site could not be obtained at a less expenditure than 40,000*l.* to 50,000*l.*, which was prohibitive at the outset; and there seemed to be no alternative but to make use of the churchyard of old St. Anne's, which the church had inherited from earlier days. At the first commencement of the movement for building a new cathedral the idea of the mediæval type of cathedral was still paramount in the minds of all church builders of the Established Church, and a design for such a cathedral in XIVth century Gothic style was prepared, and is still to be seen on the walls of the Diocesan rooms. Illustrations of the interior and exterior of this are now before us. The interior is simply a replica of the typical forms of a mediæval cathedral of the proposed date. The cost of realising this design, even on the smaller scale necessitated by the limits of the St. Anne's site, and the fact that even then its congregational capacity would be but moderate, seem to have come pretty near to abolishing the cathedral project altogether for the time.

When the project was revived and put into the hands of Sir Thomas Drew as architect, his mind reverted to some of the suggestions made by that in general very conservative amateur Mr. Beresford Hope, in his "Cathedral of the Nineteenth Century," in which he half admitted, though in an apologetic manner, the unsuitability of the mediæval type of cathedral, and hinted at a possible return, in the next century if not in his own, to the early Basilican type of church for the modern cathedral.

Acting on this suggestion, Sir Thomas Drew considered whether it was possible "to devise a cathedral church to fulfil its essential purpose, not necessarily in the accepted style of architectural treatment, of a plainer and yet not undignified character, and which, fitted to the restricted site of old St. Anne's, would give Belfast a great congregational church for 3,000 or 4,000 worshippers." Contemporary architectural opinion supported him in this idea, and the result was the plan as appended here, with a short choir or chancel only, the actual choir being accommodated under the crossing, and the nave arcade being built not on clustered piers in the mediæval style, but on mere pillars which would occupy less space and render the nave more open for worshippers. It is this plan which is being carried out, and of which, as already remarked, the nave is now completed, temporary stalls for choir and clergy having been placed in it until the choir can be proceeded with. The cost of the work up to the present time has been 30,000*l.*, and it is estimated that the whole design can be completed for 100,000*l.*

As far as the plan is concerned, it seems a very good solution of the problem, except that, in a practical sense, we doubt the usefulness of the extended transepts, and are inclined to think that an even closer approach to the Basilica form would have been better.

The question what should be the architectural treatment was the occasion of a great deal of thought and study on the part of the architect. He rejected the Italian style usually associated with the Basilica plan. While the Basilican churches of Italy were suggestive as to plan, he thought that this suggestiveness did not extend to the architecture of the Italian classic Renaissance, "which by association with countless secular and profane uses had ceased to be distinctive of a church." But this is surely very much a mere matter of association. Italians do not feel the incongruity suggested, nor Roman Catholics generally, whose thoughts on the subject all revert to Italy as the land of church building, and to the

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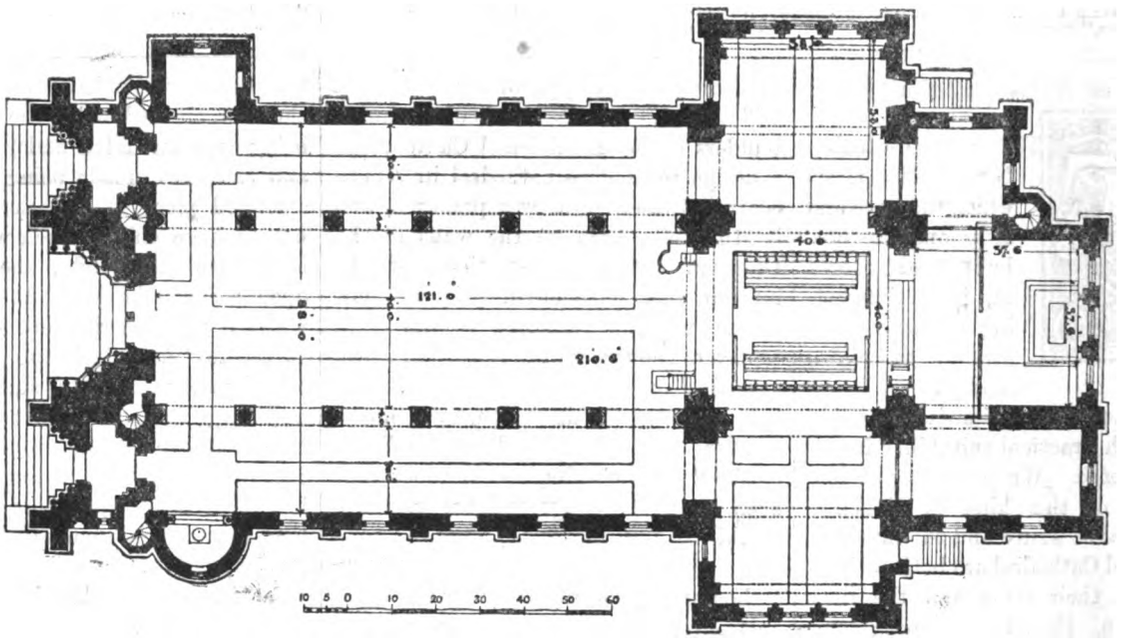
classic St. Peter's as the mother church. Our idea is, if a Basilican plan be adopted, that the architecture should be treated on classic general lines, but with what may be called Christianised and symbolical detail. In St. Paul's it is the detail only that is pagan; its grand general design might very well have been carried out with a much superior and more intellectual character of detail. However, Sir Thomas Drew's argument would no doubt have much support in ecclesiastical and popular opinion. His feeling led him to a preference for the traditions of the early Romanesque round-arched style, which, even in the XIIth century, "presents a tradition of the dignities, grace and refinement of classic art." It hardly gives us that feeling, except in regard to some details; early French capitals, for instance, retain much of classic feeling and refinement; but the general impression of a Romanesque church seems to us as un-classic as anything could well be.

We quite agree, however, that the Romanesque style goes well enough with such a plan as this, and that its adoption would probably give more general satisfaction than the adoption of the classic style more generally associated with the Basilica plan. The exterior design, as shown in an illustration before us, but not suitable for reproduction in our pages, shows the end of the nave with a great triplet of round-arched windows, and in front of the lower part of it a western façade or triple porch, with a gable over the deeply-recessed central arch, and a decorative wall-colonnade above the heads of the side arches, connecting the whole together. This, we gather, is not yet built. The intended crossing tower is a massive square one with angle turrets rising high above the parapet line (they would possibly be better a little lower), the lower portion a plain mass of masonry, the upper with a triplet of large windows on each face, above a wall-arcading. Taking it as a whole, we should say that the architect has succeeded in giving Belfast (when the building is finished) a cathedral which has a great deal of the outline and proportion of the mediæval cathedral without adopting mediæval detail. It will be a fine building when completed, and under the restrictions as to site and expenditure already referred to it promises to be a very good solution of a very difficult architectural problem.

Internally the nave is not covered by a vault, but by a coffered wooden ceiling; this of course would be quite in keeping with a substructure designed on Romanesque lines. It is intended that ultimately the interior should be extensively decorated with sculpture and painting; and some important stained glass windows have already been erected, those in the west windows being by Mr. James Powell, on which special pains and study have been spent, and which is considered by the architect to be a remarkable effort in stained glass. The pulpit has been executed by Messrs. Farmer and Brindley from a design by the late Sir G. Scott, made originally for another purpose, and as may be supposed, in a style which does not exactly harmonise with the architectural treatment adopted for the building.

We hope that the Cathedral, once got so far, may be more speedily completed than was at first hoped, and that the architect may have the satisfaction of witnessing its completion.



Belfast Cathedral. Plan as Proposed.

EVOLUTION OF EARTH STRUCTURE.

WHATEVER may have been the character of its surface when our earth was "without form and void," it is obvious to the most superficial observer that it has subsequently undergone considerable modifications. The existence of marine fossils on mountain tops, of beaches raised high above the ocean level, and of submerged forests are a few of the most easily-recognised evidences of these. And that these changes are due to the two great natural forces, fire and water, is equally evident, though exactly how and in what relative proportions these agencies have acted are still largely matters of speculation. Scientists in the past have attributed now to igneous and now to aqueous forces the chief responsibility for the modelling and remodelling of the earth's surface, while more recent investigators have put forward reasonable grounds for believing that it is to the combined and more or less contemporaneous effects of these forces that the present structure and outline of the lithosphere are due. The work on "Earth Structure," by Mr. Reade, is a recent contribution to the solution of the problem.* While claiming a certain amount of originality for his theories, the author puts them forward as a natural development of the principles expounded by Hutton, Lyell, and indirectly by Darwin, which applied universally-recognised dynamic principles to the explanation of geologic facts. The author's training as an engineer and architect has peculiarly fitted him for dealing with the subject from this standpoint, while as an enthusiastic amateur he has escaped the fetters of the schools, which often tend to hamper and bind the scientific investigator. At the same time it must be admitted that the freedom of the amateur has dangers of its own, especially when, as in the present case, a hobby has to be pursued during the brief intervals of professional work. This drawback perhaps accounts for the absence of that conciseness and orderly arrangement demanded in the treatment of a scientific subject if the results arrived at are to be adequately appreciated. The author would probably be the first to admit that with more time at his disposal he could have materially condensed the 328 pages of which the volume consists. For want of such compression a somewhat excessive demand is made on the time and patience of the reader, while a more careful consideration of the chapter and paragraph headings and of the various divisions of the subject would considerably add to their intelligibility.

* "The Evolution of Earth Structure, with a Theory of Geomorphic Changes." By T. Mellard Reade, F.G.S., F.R.I.B.A., A.M.I.C.E. London: Longmans, Green, and Co. 1903.

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The present volume is an amplification and rounding-off of the author's "Origin of Mountain Ranges" published some quarter of a century ago, rather than an entirely original treatise. For the benefit of those unacquainted with the earlier volume the theories it advances are recapitulated. Expressed shortly, these may be described as attributing the process of folding and building-up of mountain chains to the cumulative effects of recurrent lateral expansion—with its converse lateral compression—and consequent variations of loading. Since it was first advanced the author has further tested his theory by a series of experiments with a lead-lined sink subjected in everyday use to alternations of temperature which have produced folds and creeps similar to those found in mountain ranges, and with cakes of clay and other materials to which circumferential compression has been applied by the aid of an ingeniously simple encircling band. The results of these experiments are illustrated by an excellent series of photographs.

Following on from his earlier conclusions the author has formulated the theory, which the present volume is largely devoted to demonstrating, that the changes of level which the earth's surface has undergone in more recent geologic periods are due mainly to changes in the bulk or specific gravity of its constituents without corresponding changes in mass resulting from alterations of temperature. The various ideas as to the origin of these temperamental changes are fully discussed, and the value of quantitative analysis in relation to them is emphasised. Volcanic energy is thus shown to be important rather as an effect than as a cause of change, and as demonstrating the continuance of activity in the earth's laboratory, *i.e.*, of the life of the planet.

The limited extent of our actual knowledge of earth structure is well illustrated by a diagram showing the proportion of the lithosphere—consisting of the intrusive and consolidated igneous rocks, such as granite, and estimated at some thirty miles—to the magma or shell within which most of the fluctuations of volume creating elevation and depression takes place, and of both to the nucleus, these together making up the remainder of the earth's 8,000 miles diameter. The common class-room demonstration of a circle drawn by chalk, and limited only by the size of the ordinary blackboard, in which the thickness of the finest chalk line indicates the depth of the lithosphere, gives a vivid, if approximate, idea of these proportions. Of the nucleus nothing is known beyond the fact of its rigidity as deduced from the transmission of earthquake shocks.

It seems to be generally recognised that the proportion of continent to ocean has not materially altered from the earliest times. This is attributed by the author to the magnitude of the masses on which the earth's forces have to act and their slowness of operation, an explanation entirely at variance with the catastrophic theory held by many, especially of the earlier authorities. Space does not allow of our following the author in his interesting description of continental growth through the geologic periods, beyond the mere statement that he attributes this to the combined effect of subaërial denudation and chemical decomposition, by which the land is alternately worn down and built up again, and that mountain upheaval is not a separate process, but is connected with the formation of new land areas.

The consideration of the characteristics of the rock groups of the great periods is a branch of the subject that may more especially appeal to architects as affecting the study of materials with which they have to deal. Here again, in opposition to the idea that the similarities which are found to exist between the various groups are due to cataclysmic convulsions, and also to the idea that their uniformitarianism is due to continuity and recurrence—of which Lyell was the great exponent—the author considers these similarities are evidence rather of orderly development.

A section of the volume is devoted to oceanography, the study of which has been stimulated during recent years by the necessity of exploring the ocean bed to ensure that telegraphic cables are laid to the best advantage. But this branch of the subject is still only in its infancy, and the explanation of the ocean "deeps," which are known to exist as basins, and which constitute one of the chief differences between land surfaces and those of the ocean bed, has still to be formulated.

The latter portion of the volume is devoted to the consideration of slaty cleavage, attributed by the author to temperamental pressure and movement on a base chemically and mechanically fitted for its production and illustrated with an interesting series of photographic sections, and also to the reproduction of addresses given by him as President of the Liverpool Geological Society and otherwise. These necessarily recapitulate to some extent matter scattered throughout the volume and might well be relegated to an appendix. The book contains so much of value and of interest that it is with regret we find ourselves unable to accord it unqualified admiration, but the hope may be expressed that, before a second edition is called for, the author may find time to apply the same methodical care to its revision that he has devoted to the experiments on the results of which he has based his theories. If at the same time its specific gravity—to use a technical term—could be reduced, it would greatly add to the comfort of its perusal, and we could then heartily recommend it as both instructive to the student and stimulating to the geologist.

NOTES.

A Lightning Demonstration.

On Saturday afternoon last Sir Oliver Lodge gave at the Institute of Architects, to the members of the Lightning Research Committee and some others interested in the subject, a practical demonstration of the action of lightning, more especially as regarded lightning conductors. The electrically charged cloud was represented by a thin sheet of metal mounted on non-conducting standards charged from a battery at pleasure, and placed in a position sloping downwards from front to back, so that the model lightning conductors could have their points brought nearer to or further from the under surface of the "cloud" by shifting their positions on the table. Some of Sir Oliver's conclusions were much at variance with what are popularly accepted. He placed in operation successively conductors of three different substances—copper, iron, and wet string. The copper was the most intense and rapid conductor, producing a sharp crack at the flash; the iron took it with less noise, the wet string with hardly any, yet it was efficient in protecting the two other conductors. Wet string is of course impossible in practice (the thunder-shower performs some of its function, however, in relieving pressure), but Sir Oliver maintained that iron was quite as efficient a conductor as copper—and more, that the intensity of action of copper was more likely than iron to set up side-flash, which, in protected buildings, has been the origin of most lightning accidents. Sir Oliver also illustrated and described his classification of lightning into two kinds, which he called "A-flash" and "B-flash." The former was the normal discharge of lightning from an overcharged cloud direct to earth; the B-flash occurred when a large cloud discharged into a smaller one, generally though not necessarily below it, which was overcharged suddenly and discharged to earth with great violence. Sir Oliver Lodge proceeded to show, by several illustrations, why the B-flash might be expected to be more sudden and intense than the A-flash, and proportionately more difficult to protect against, though he would not say that all lightning injuries had resulted from B-flashes. The practical outcome of the demonstration was that a building should have as many points of protection as possible, and that (if we accept Sir Oliver's teaching) the copper lightning conductor is dismissed with costs.

Drain or Sewer.

The question of "drain" or "sewer" has again come before the Courts in the case of Thompson *v.* Eccles Corporation, and the three judges constituting the Divisional Court have declared that it is impossible logically to construe the legislation on the subject. The local authorities called upon the appellant, in this case the owner of a block of seven houses, to abate a nuisance arising from the drainage of one of them and to reconstruct the sewer or drain. These seven houses were drained by means of a 9-in. pipe, which passed under their cellars and led into the respondents' sewer. This 9-in. pipe, however, was a continuation of, and received the drainage from, a 6-in. pipe which drained two blocks of six houses, in different ownership, before it reached the respondents' sewer. By section 4 of the Public Health Act, 1875, "drain" is defined as "any drain of and used for the drainage of one building only or premises within the same curtilage and made merely for the purpose of communicating therefrom . . . . with a sewer . . . ." But section 19, sub-sect. 1 of the Public Health Acts Amendment Act, 1890, enacts that

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"Where two or more houses belonging to different owners are connected with a public sewer by a single private drain," then the provisions of the Public Health Act, 1875, as to nuisances from drains are to apply. Sub-sect. 3 provides also, "For the purposes of this section drain includes a drain used for the drainage of more than one building." The judges found it difficult to determine what meaning should be given to the words "a single private drain" in sect. 19, since under section 4 of the Act of 1875 a drain connecting different buildings (even in the same ownership) with a sewer, ceases to be a drain. The Court intimated that the fact that a drain was wholly laid on private land was not sufficient to render it a private drain, and this section was construed only to apply to a drain draining more than one house for the profit of the maker of the drain, or by special agreement with the local authority, and to have no application to the circumstances under consideration. This decision conflicts with that of the Divisional Court given in 1896 in the case of Bradford *v.* Mayor of Eastbourne, in which the decision was that the Act of 1890 extended the definition given in the Act of 1875; and there is a serious conflict in the decisions on the point. The judges who decided the present case intimated some doubt whether this legislation was not the result of a misconception of the law, and also expressed a hope that their decision might be reviewed by higher tribunals. We, however, trust that the promised legislation will soon be forthcoming, as it is extremely undesirable that the daily relations of householders should be controlled by legislation incomprehensible even in the Law Courts.

Steel in American Buildings.

IN a paper read before the Iron and Steel Institute Mr. B. H. Thwaite traces the early history and later development of steel frame construction as applied to lofty building design in the United States. Although a considerable part of this paper is devoted to details which are already perfectly familiar to most of our readers, it contains reference to several points that are worthy of note. The author shows that the new system of building has practically revolutionised professional constructional organisation in the United States, for the consulting engineer and the ironworks have largely displaced the architect and the ordinary builder, but the architect still finds scope for the exercise of his art as the colleague of the engineer. As steel frame construction seems likely to be more largely used in this country as years pass by, it is highly important that architects and builders alike should qualify themselves for dealing with the coming development by making themselves thoroughly acquainted with the theoretical and practical features of such work. The author shows that the steel-framed system enables buildings to be constructed in one-fourth of the time required for their erection by ordinary methods, thereby reducing to a minimum discomfort to the occupants of neighbouring property and interference with street traffic. He further urges the suitability of steel for fire-resisting construction when the steel is properly fire-guarded, citing as examples buildings which came unscathed and unhurt out of the disastrous fires at Baltimore, Chicago, and Rochester.

High-speed Railways.

IN an important paper read to the Institution of Electrical Engineers last week by Mr. Alexander Siemens, a description was given of the high-speed electric railway experiments which were recently made on the Marienfeldehossen line near Berlin. All the data given in the paper were taken from the official reports, and will be of the greatest use to English engineers. The experiments prove conclusively that it is possible to collect high tension currents, even in unfavourable weather, from overhead conductors, at speeds up to 130 miles per hour. Mr. Siemens stated that at these high speeds birds were overtaken and killed by the train, and that at the conclusion of the run the front of the train was covered with bees, gnats, etc., which had been smashed by the impact. The experiments also seem to have settled the vexed question of the resistance of the air to an express train. The agreement between the formulæ arrived at experimentally, and those given by Drs. Chree and Stanton is remarkable and very satisfactory. As Mr. Siemens stated, the formula is virtually involved in a theorem given by Newton in the section of his *Principia* which deals with projectiles; but Newton gives no numerical constant. We are now able to predict that if ever an express train move with a velocity of 200 miles per hour the power expended per square foot of sectional surface at right angles to the direction of the motion will be greater than 60 horse power. It seems to us that about 150 miles an hour is the limit for the speed of express trains. At speeds of over one hundred miles per hour there must be practically no curves on the lines, owing to the enormous centrifugal forces developed. The experiments as to the proper shape of the front of the train were unsatisfactory. In his reply to the discussion Mr. Siemens stated that it should be a paraboloid of revolution, but this result is too indefinite to be of any value, as the shape of this surface depends on the length of the frustum of the paraboloid we use. A flat surface is a limiting case of a paraboloid. The proper shape for a projectile has not yet been worked out mathematically, and the proper shape for the front of an express train is a much more difficult problem theoretically, owing to its closeness to the surface of the earth, which disturbs the lines of flow of the air and therefore has to be taken into account.

"The Life of the City."

THIS was the title adopted by Mr. Francis Masey, for an interesting paper read recently before the South African Association for the Advancement of Science. The Association is of recent origin, the first "Report" (in which Mr. Masey's paper appeared) having been issued exactly a year ago. Mr. Masey, being an architect, deals almost exclusively with the brick-and-mortar aspect of his wide subject, or—to use his own words—with "some of the contributions made up to the present time by physical science towards . . . the promotion of physical health in the city life." We may add that he confines himself to the problem presented by South African cities, and particularly by Cape Town. He suggests that it is the duty of the municipality to prepare a comprehensive plan for the extension of the city and for the improvement of existing thoroughfares, and advocates wide streets planted with trees, thorough scavenging of the streets, the regulation of the height of buildings, and of the methods of construction and sanitation. There is nothing particularly novel in the paper, but the author wisely lays stress on the importance of framing regulations which will be adapted to local conditions. His brief account of the growth of mediæval cities contains the following curious passage:—"More often, however, we can trace the city's growth from the church, of which it forms the centre." To build a church with a city in its centre must have taxed the ingenuity of the mediæval master-builders.

Sanitary State of West Wickham.

DR. R. W. JOHNSTONE'S report to the Local Government Board on the sanitary circumstances and administration of the parish of West Wickham, in the Bromley rural district, states that complaints of the unsanitary state of the village of West Wickham have been received by the Board at intervals during the past twelve years. Dr. Johnstone, on visiting the place, found that as a rule the house yards are unpaved or paved with cobbles or tiles, the ties being frequently broken and defective; and that the chief method of excrement disposal is by means of water-closets, the majority of which are hand-flushed. Most of them are kept clean, but a few instances were seen where their condition left much to be desired, owing either to inadequate flushing or to careless emptying of house slops upon the seats and floors. There are also a number of pail closets and earth closets. Some of the pail closets are situated in dilapidated sheds with leaky roofs, and some were in a filthy condition through overflowing. In addition, considerable nuisance is caused by the removal of the contents, and their disposal upon land, a task usually undertaken by the owner. House drains are for the most part of earthenware pipes jointed with cement. They are invariably connected with cesspools, which are usually of large dimensions. The cesspools are scarcely ever constructed of impervious material, and the consequence is that they quickly fill with ground water, and in wet weather overflow into roadways, house yards, and sometimes into the houses themselves. The report states that it is necessary that some remedy should be found for the insanitary state of affairs at present prevailing:—

"The cost of contracting for the emptying of cesspools was found by the District Council to be prohibitive. Moreover, such a plan has the disadvantage that the cost increases with the increase of population and rateable value. The main bar to its adoption, however, is that owing to the water-logged nature of the soil in parts of West Wickham, it would be a matter of great difficulty and expense to provide watertight cesspools, without which a system of cesspool emptying would be ineffective.

"The alternative is a sewerage scheme. With

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the increase of population and rateable value the sewer rate would diminish, and the fact of having sewers would tend to increase the rateable value by encouraging building."

Haymarket Theatre.

IN order to comply with the requirements of the London County Council in respect of the public safety Mr. C. Stanley Peach has prepared plans for Mr. Harrison, the lessee, for improving the interior of the house mainly by way of precautions against fire and of providing better means of rapid egress. The present interior was remodelled for Sir Squire Bancroft by C. J. Phipps in 1879; seven years ago Mr. Harrison effected some structural alterations of the back portion of the building. The theatre was built, after Nash's plans and designs upon the site, measuring about 61 ft. by 135 ft., of Nos. 8, 9, and 10, Haymarket, and premises in Suffolk-street at the rear, leased for a term of ninety-nine years from the Crown. It was erected upon ground adjoining—with an interval of but a few feet—the south side of the former house, illustrated in the *Builder* of January 2 last, after a drawing by Schnebellie, which was originally built for John Potter and opened by him on December 29, 1721, as the New French Theatre with a company of comedians from Paris. Subsequently called the "Little Theatre in the Haymarket," it was used for English and Italian opera. Cibber, Harper, and others removed thither on their secession from Drury Lane Theatre, and there, in 1727, was produced the "Beggars' Opera." Macklin was succeeded as manager by Foote, who in July, 1766, obtained letters patent under the Great Seal, and enlarged the house at the side and at the rear, and added the portico shown in our view. In 1820 Morris and Winston, as successors of George Colman the younger, pulled down the former house, and on July 4, 1821, opened the house built for them by Nash. The clock given by Foote to the green-room passed into the possession of Sir Squire Bancroft. Amongst the "first appearances" were those of Henderson, Bannister, Mathews, Liston, Elliston, Edmund Kean, and Young; Lavinia Fenton (Duchess of Bolton) and Eliza Farren (Countess of Derby); and there in February, 1851, Macready gave his final performances, during the lesseeship of Benjamin Webster.

The Leicester Galleries.

AT the Leicester Galleries two collections are on view: Mr. Elmslie's water-colour drawings illustrating "Japan and its People," and Mr. Nico Jungmann's collection of paintings which might be entitled "Holland and its People." Mr. Elmslie's drawings, in the main, are rather of what we may call topographical than artistic interest; they impress one as being very careful and accurate representations of Japanese personality and life, but are not for the most part drawings which would compel attention from their artistic interest alone. Among the exceptions are the single figures entitled "A Dancer's Musician" (42), "A Girl Reading" (49), and "A Musician of Sacred Music" (69). These are very careful studies of countenance, costume, and accessories; and "The Japanese Peasant Woman" (33)—stated to be "the general type, not made up in any way"—is a very good firm piece of figure painting. In other respects this collection is a very interesting illustration of Japanese life and surroundings, which was perhaps the principal object. The artist shows us the "Dinner Party" (31), where the guests sit on cushions on the floor and are entertained by (apparently) a hired dancer; "The Rustic Mode of Making Rice Flour" (26), a most primitive piece of mechanism; "The Cloisonné Studio" (12), "The Jinrickshaw Man and His Fare" (14), and many other incidents of Japanese life. One or two pictures of gardens are curious as showing how completely the old blue china garden pattern represents the real facts of a Japanese garden, showing in a naïve elevation what these pictures show in realistic perspective. Mr. Jungmann's manner of painting the Dutch, or certain types of them, is well known in London now; he has made a style of illustration and execution of his own, and his figures are highly characteristic; but the artificial style, with the doll's houses and Noah's ark trees, gets wearisome before one has gone through the collection. It is a manner of painting which at first attracted people by its novelty and individual character, but it is not genuine art, and will not keep its attractiveness after the novelty has worn off.

The Academy and the Chantrey Bequest.

THE *Spectator* returned last week to its attack on the Royal Academy in respect of the administration of the Chantrey bequest; a criticism with which, on general grounds, we are entirely in sympathy. There can be no doubt that the Academy, whether from short-sightedness or from whatever other cause, has practically used the bequest for buying in pictures and sculpture—mostly pictures—from its own exhibitions, and in many cases by its own members, and that a good many of these purchases have not represented that very high class of work which was contemplated in the decided and almost stringent terms of Chantrey's will. At the same time the assailants are somewhat too sweeping in their condemnation, and thereby weaken their own case. Among the works which ought not to have been purchased the *Spectator* includes, among pictures by Academicians, Millais' "Speak! Speak!"; and among those of outsiders Mr. J. Clark's "Early Promise." Both these condemnations are surely quite uncalled for. Millais' "Speak!" is a most remarkable picture, and would stand among the leading works in any collection of modern paintings; and Mr. Clark's "Early Promise," though only what is called a *genre* picture, was quite exceptional as such—a most delicate and refined piece of character painting, which made a reputation for its author at once, though we hardly think that he has ever equalled it since. It can hardly be supposed that Chantrey meant to exclude *genre* painting, so long as it was first-rate of its kind; and "Early Promise" certainly is so. The banning of these two purchases shows a want of sound judgment on the part of the critics of the Royal Academy, and would tell against them if there were any formal inquiry into the administration of the Chantrey bequest.

ARCHITECTURE AT THE ROYAL ACADEMY.—III.

TO THE ordinary visitor, and perhaps to the architect, domestic design is doubtless the most attractive of the various kinds of work exhibited in the Architectural Room. It is the subject nearer the reach of general understanding, and one that is usually represented in pleasing variety by pretty drawings. It would further appear to be the aim of the authorities, not so much to encourage the art as to make this department popular by hanging little that is not prettily rendered to the exclusion of illustrations of a more technical and diagramatic nature, which are inseparable from a critical study, and behind which lies the true merit in design.

Of the larger houses to be seen, few are entirely new conceptions, the greater number representing enlargements of existing mansions; and in almost every case no idea is given of the former condition of the places, and consequently no adequate opinion is to be formed of the design for which the exhibitor is actually responsible.

Foremost in importance is "Eynsham Hall, Oxfordshire," by Messrs. Ernest George and Yeates (1,490), a large stone house in the Elizabethan manner with an H-shaped plan. The drawing shows two loggias open to the terrace between the wings, reminiscent of Holland House and Bramshill. The plan is interesting, having, with the usual apartments, provision for an estate office arranged in connexion with the owner's business and secretary's rooms. The kitchen and general offices must be located in a basement, but of this there is no outside evidence. The external open staircase is nicely designed, and suggests the fact that there is much scope for a greater architectural treatment of these everyday features than is often the case. The parapet, with its carved strapwork panels, is quite of the period, but seems to hide the roofs. The chimneys are specially grouped for this drawing and do not bear out the plan, which is here given to a large size, although scale and compass points are missing. "Ruckley Grange, Shropshire" (1,505), by the same authors, is a smaller house, in the design of which the roofs take a prominent place. An elevation (without scale) is given in addition to the view, and although there is no information as to the plan, the house is designed with character and in very good scale. The roofs are pitched at 45 deg., which is not a very satisfactory angle and was not generally resorted to by the XVIth century builders whose work is followed in this design. These are two excellent drawings by Mr. Ernest George, whose contributions have helped to enhance this annual show for many years.

"Additions to Branches Park, Newmarket" (1,491), by Mr. G. Hornblower, has nothing, beyond a scrappy key-plan on the frame, to convey what is new and what old. As a late XVIIIth century mansion it is not of the best, and as a finished residence it is even less interesting. There are too many planes and too many projections for a design of this severe type to be considered happy.

No. 1,489 is a series of delightfully fresh sketches in line and colour of an important house, "Rosehaugh, Ross-shire, N.B.," of which Mr. W. Flockhart is the architect. Here is grandeur in a fine composition, the design of which is based on what is best in French Renaissance. A large tower with angle turrets stands foremost in the design, whilst high-pitched pavilion roofs and large window projections, terminating in ornate gables, rise at prominent points. A successful contrast is provided by the massiveness of the heavily-buttressed retaining walls of the gardens consequent upon the hilly nature of the site. Several coloured sketches of interiors are given in No. 1,504 in which it is seen that schemes based on various English styles are introduced. "The William and Mary bedroom" is perhaps more free from tradition than "The Jacobean bedroom." "The Tower Smoking Room fireplace" is a charming drawing of a heavy, sculpturesque stone mantelpiece, showing strongly the influence of Alfred Stevens; the fireplace opening, however, is small in relation to the whole. Although these sketches are brilliant, too much is left to the imagination; a plan of the house and of the lay-out would have doubled their value.

Mr. A. N. Prentice contributes two clever drawings, done in the best Academy method, of "Chelwood Manor, Sussex" (1,547 and 1,548). This is an extensive house on a sloping site,

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having a local stone ground story and very busy half-timbered upper floors, finished with tiled roofs and large brick chimneys. Apart from the perspective drawings, the plan gives the information that this is a large house, but the use of half-timbering is not, in our opinion, a suitable style for a work of this magnitude. If tradition stands for anything, there are at least six houses in this composition; in other words, the detail does not lend itself to a broad treatment; and it is here noticeable how disturbing is the multiplicity of parts. We gave an illustration of the design on April 30 last. No. 1,574 is a set of scale drawings, showing the remodelling of "Guisborough Hall, Yorkshire," by Mr. A. C. Martin. Plans and elevations both before and after the alteration are given, whereby we are enabled to form the opinion that the development of the house is in every way an improvement; and a satisfactory change in the fronts is effected by the use of a good stone treatment. The scheme is worthy of a better rendering. "Proposed additions to House in Cheshire" (1,576), by Mr. T. M. Shalleross, conveys no idea of which part of this rough cast, half-timber and green slated house, comprises the additions, for it is all rendered alike. The weird drawing gives a feeling of desolation, and the absence of figures and plans intensifies the mystery.

Mr. Leonard Stokes's most important contribution is "Sketch design for Minterne House, Dorset" (1,577), shown in two good pencil drawings. This large house, to be built in stone, has an interesting plan, in which the chief feature is a long, vaulted central corridor, on the south side of which are located the principal apartments, including a billiard room. The latter takes the form of a wing set at an oblique angle from the line of the main front, and serves to screen some of the servants' quarters from the garden. A large square tower rises at the east end, and the kitchen block projects on the north front giving a courtyard effect. The fronts are designed, broadly speaking, with an ornate XVIth century feeling; the hall windows have traceried heads and transoms, whilst the two wings referred to have a much simpler treatment, more in keeping with the historical use of the material. There is great variety in planes and detail; the rusticated quoins rising above the roof lines as piers, have, however, very little meaning, and the battlemented parapets, together with the variety in dormers, add to the disturbance which detracts from the merit of an essentially excellent house.

No. 1,619 represents a sort of Monte Carlo residence in a clever water-colour drawing. The catalogue puts a totally different complexion on the exhibit, and as no plan is given to explain that the drawing illustrates alterations and additions to a house, we fail to see what purpose is served by hanging it. It is substantially one of the "pretty pictures" to which we referred above. A very prominent position is allotted to "Additions to Hursley Park, Hampshire" (1,640), Messrs. A. M. Mackenzie and Son, architects, the reason for which we are also at a loss to understand. There is again no indication of the parts comprising the additions; but whether the drawing represents the original or the altered design there is nothing to merit such a conspicuous position. It would be interesting to know upon what lines the Hanging Committee proceeds to select, and then to place, drawings of this description.

"Burton Hall, Chester" (1,639), by Messrs. Nicholson and Corlette, is a house with some life in it. The happy combination in materials—red sandstone and green slates—is broadly handled, and the overhanging eaves and green shuttered first floor story enhance the design. An extensive formal garden scheme is shown but no plan of it, or yet of the house itself, is given. Of the few remaining larger houses, "Carriage Court, Tylney Hall" (1,455), by Mr. R. S. Wornum is perhaps the most important. Elizabethan in style, a less symmetrical design than usual is shown by a slight ink sketch. No. 1,589 is a "House in Kensington Palace Gardens," built upon a spacious site which seldom falls to the lot of an architect in London. Mr. E. P. Warren has produced a square plan with a basement story. A Georgian-like massing of the brick and stone materials is imparted to the exterior, but a more orthodox use of XVIIIth century detail and proportions would have added to the interest of the design which is rendered by an elevation and two plans, from which scales, etc., are missing.

In the smaller domestic work the usual range in subject and variety is to be seen. Taking the order of the catalogue, we find "Pavilion for the Consolidated Clubs, Magdalen College, Oxford" (1,429), somewhat skied. The author, Mr. R. P. Jones, has produced a design which is a distinct advance upon the average erections of this kind; a reproducton of the drawing appeared in our pages of February 20. "A Pair of Houses" (1,435) is a modest drawing of a stone-built dwelling, in which the architects, Messrs. Freeman and Ogilvy, show due regard to the material. "Reception Hall, Rectory Farm, Streatley" (1,443), is an interior subject by Mr. O. P. Parsons, with but little architecture in it; there is, however, a remarkable expanse of gold mount and frame surrounding the drawing. No. 1,454 is a very well drawn interior of a Jacobean order, designed with excellent feeling by Mr. T. Johnson. "House in Russia" (1,458), by Mr. M. H. Baillie Scott, is a composition in which a great effort is made to interrupt as little as possible the large expanse of rough cast walls and red tiled roofs, and the windows and other disturbing elements are, therefore, contrived to this end. The main roof rises to a very considerable height, and should look well, we imagine, if a good material be found for its covering. An external open staircase is shown at one end of the principal front, but only one chimney appears in this—the important—part of the house, and no plan is present to explain the reason. "Bronygarth, Woldingham" (1,446), is another rough-cast house, which the author, Mr. W. R. Davison, shows by a good sized plan, two exterior and one interior views. A verandah is introduced on the south and west fronts, terminated by square bay windows of the dining and morning rooms. The house is probably designed for the site and not to suit the compass points, for we find the morning room at the north-west angle. A serious defect is disclosed by the plan, where it is seen that the cook will deprive herself of the light necessary for the important culinary operations. Kitchen ranges, of all places, require a side light. In the "House at Knowle, Warwickshire" (1,462), Messrs. Buckland and Farmer are certainly picturesque in their methods. The design is terribly cut up, however, and is only saved from failure by the sober lines of the main ridge. "No 75, Cheyne Walk, Chelsea" (1,470), designed by Mr. C. R. Ashbee, has the appearance of being a small house. The interior view, however (1,444), gives quite a contrary impression. Anyhow, there is something pleasing in the recessing of the various stages seen in the former drawing, where everything has been subordinated to the emphasising of the principal floor, which is lighted by a range of five long windows. Two lower stories project considerably toward the street, but the flat which covers them is provided with a poverty-stricken balustrade consisting only of posts and chains. This is the only note of affectation in a simple and clever design.

Several street fronts are hung in the room—No. 1,469, by Mr. C. J. Bathurst, is perhaps the best of them. The design mainly consists of heavy stone basement and ground stories, two upper floors in brick, and a green slated roof, very busy with two sets of dormers. The long vertical lines in the brick part of the front are quite satisfactory, while all the respective materials are intelligently handled. No. 1,468 is another front of a Town House, shown by a ¼ inch scale elevation. The materials are identical with the design just referred to, but the detail of the upper stories is too fussy. The main cornice has no returned ends, and would have a most abrupt appearance, while it is difficult to determine whether the windows are casements or double-hung sashes. No. 1,485, drawn and designed by Mr. R. F. Graham, is a neat sketch of a similar subject, but very much in the nature of what is generally found in the West End.

"Proposed Villa near Antwerp" (1,472) is quite modern English in character. The design, of which Mr. R. F. Atkinson is the author, is an effective arrangement in shadows and projections. A colonnaded verandah is placed on the ground floor, above which is a long bedroom story having two wooden bays and a large overhanging gable grouped at each end. The eaves also has a large projection and the effect of the angle view showing the gables springing from nothing is not successful. There is no plan. "Hall Place, Shackleford, Surrey" (1,494), is a pencil drawing illustrating certain extensions to an old house, the nature of which is conveyed by the small key plan. The architect, Mr. H. Tanner, junior, has introduced too many small parts in bays, nooks, and arcades, whilst the main additions, and, indeed, the house itself, are overpowered by a very large gable. Beyond the chimneys very little of the tradition of the existing work is followed.

FURTHER NOTES ON ROYAL ACADEMY PICTURES.

THIS is not a great portrait year, in that there is no such striking and brilliant portrait combination as Mr. Sargent has shown us on more than one occasion, as well as Millais in earlier days; but there are a considerable number of fine and more or less interesting portraits. Mr. Sargent's "Mrs. Wertheimer" (301) may be said to be the finest of the year; the broadest and most equable in style and in the treatment of face, costume, and accessories; few families have had so much artistic talent expended on their portraiture. In some of the most effective portraits of the year the face seems unfortunately to be the least successful element, and Mr. Sargent's large and grandiose portrait of "The Countess of Lathom" (175) comes into this category; the whole picture is dignified to a degree, perhaps even a little too pompous in style, but the face is rather hard and expressionless. His full-length portrait of "The Duchess of Sutherland" (206), standing in the shadow of a wood, in a brocade dress in which light green predominates, is a striking and effective colour composition, and in this case the head is worthy of the whole. Two of the more satisfactory portraits, in unity and breadth of style, are the two by Mr. Cope in Gallery I., the Archbishop of Canterbury and the Lord Chief Justice. In both of these the head, the costume, and the accessories are treated in a broad style of execution which seems to blend the whole together; the difference between this and the portrait painting which combines forcible treatment of costume with what one may call a wooden treatment of the head, may be appreciated by comparing Mr. Cope's Archbishop of Canterbury with the portrait on the same wall which forms the pendant to it in the hanging. Among the portraits which make no attempt at effect, but are simply good likenesses (the most important object, after all, in a portrait), Mr. Shannon's of Sir W. Emerson (119) is excellent; Mr. Bacon's of Mr. Spielmann (743) has the same merit, as also Mr. Collier's of Professor Ray Lankester, who is represented as lecturing at the conventional green table. Among the same class of portraits which aim at being simply likenesses, without studying special effects, are that of Mr. G. W. Palmer by Mr. Cope (366) and that of Mr. Mildmay by Mr. Ralph Peacock (846); in these two cases we cannot judge of the likeness, but both look as if they should be likenesses, and are good plain unpretending portraits, very well executed. Among those which aim at more dramatic effects, Mr. Furse has painted Mr. and Mrs. Oliver—he engaged very eagerly in salmon fishing, and the lady lying face down on the rocks overhanging the stream, watching the result. This is vigorous in action and excellent in colour; as to being painted in this kind of special occupation, that is a matter of personal taste; to our thinking a portrait should have more repose. Mr. Ouless's bust portrait of Earl Bathurst in peer's robes (347) is fine and forcible, both in expression and colour.

Landscape, apart from sea-painting (of which we have already mentioned the finest examples), is stronger this year than it usually is at the Academy. There are some things, no doubt, that would strike one more if one saw them for the first time; Mr. Peter Graham's rocks and sea for instance (56), and "The Edge of the Loch" (126); these are Mr. Graham's two pictures, and one has seen them both scores of times. Mr. Murray's landscapes seem more and more wanting in unity of composition; they are what we call ragged landscapes, with no predominating motive in them; and he is unwise to draw attention to the fact of painting scenes that Constable has painted, thereby suggesting comparisons. Mr. East is at his best this year. Of his three landscapes the most complete and satisfactory is "Morning at Montreuil, Pas de Calais" (336), with its grey dewy foreground and massed trees, and the morning sunshine seen beyond them. Mr. David Farquharson's "Full Moon and Spring Tide" (195) is a fine picture, more like moonlight than are many so-called moonlight

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pictures; the breaking sea in the foreground is perhaps purposely kept a little vague and uncertain in order to give the effect of a sea half visible in the moonlight; it is a bold attempt at a very difficult effect, and if not entirely successful in a realistic sense, it is successful in the poetic sense. Mr. J. Farquharson's landscapes belong to the realistic order, and as such they are good, especially "Homewards" (469), a twilight snow scene with a lonely figure hurrying through it. His other snow scene (268), with a rather too yellow evening sky behind, is very real and very effective in its way, but it is successful imitation of nature rather than landscape-painting in the higher and more poetic sense. One of the finest landscapes is that by Mr. Aumonier which is cornered in Gallery XI. —"The Borderland" (858); not a picture to take the popular taste, but there is certain grandeur about it, and it is what landscape should be—a poetic rendering rather than a transcript of nature. Mr. Clausen's "Willow-trees at Sunset" (45) possibly goes a little too far in the direction of translation as opposed to imitation, but it is a very interesting and unusual work, full of artistic suggestion. Some other landscapes that are worth special note we may take in the order of hanging. Mr. Leader's "Sandy Shore on the South Coast" (14), in spite of its steely sea in the distance, is a really good study of sandhills, far more interesting than his regulation evening effect in Gallery III. (168), the kind of picture that is dear to the average visitor, and which is simply the repetition of a conventional effect that we have already had over and over again. Mr. Arnesby Brown has started on a new track in his little seaside picture, "The Bay, Twilight" (34); it has a little too much light for the effect intended (it is so difficult to paint the absence of light!), but it is a very pleasing and poetic little painting, and interesting as a new effort by an artist who has hitherto confined himself to one class of subject. Mr. Fred Hall's "Silver and Gold" (461) is a very clever picture of a special effect; silvery hoar frost on the foreground contrasted with the red morning sunlight reflected from the cliff behind; quite an original work. Mr. W. Ayrton's "Marsh Marigolds" (492) is a very bright bit of flat landscape with a wide sky above it; a picture that gives promise for what its author may do in the future. "Phosphorescence and Moonrise" (501), by Mr. Wehrschmidt, one does not quite know what to think of; it is a clever attempt to paint what it is very difficult to realise in pigments at all, and unless one had seen the thing in nature it is difficult to form a judgment of it; but it is not a work to be passed over. Mr. Parsons gives the title "Bonnie Scotland" (537) to a picture which is very different from what the title would lead one to expect, the main factor being a foreground heaped with bright flowers; a rather unusual corner of Scotland, one would say, but also an unusual picture, and one which has the merit of breaking this artist's rather too constant repetition of one effect in landscape. Under the title "A Sunny Shore" (575) Mr. Lionel Smythe paints the bright flat sands of Wimereux in the holiday season and diversified with holiday figures; a picture at once pleasant in itself and giving a true impression of the place. In Gallery IX., the room of the cabinet pictures, Mr. Albert Goodwin has a small and subtle painting of "Vesuvius in the Moonlight" (670); and Mr. Adrian Stokes a small landscape in which "The Blue Pool" (682) is contrasted with the golden splendour of sunlit trees; "a symphony in blue and gold" it might be called, and a very bright and vivid one; and Mr. Clausen exhibits in the same room what we think is his best picture of this year, "A Frosty March Morning" (756) in a turnip field, a remarkable bit of truthful representation arrived at by a broad method of painting—real without realism.

We will now note, in the order of hanging, some of those mostly smaller works, not comprised under the heads of either portraiture or landscape, which claim notice for their own merits or for the names of their authors. Mr. Tuke's predilection for the nude figure in air and sunlight, which has been the occasion of some of his best works, is only exemplified this year by the small picture, "In the Morning Sun" (38), a bright bit of painting of a single figure in the open air, but rather a study than a picture. Near this is Mr. Wetherbee's beautiful little pastoral, "Golden Silence" (49), one of his works in which figures and landscape go together in harmony; the figures here are of modern rural life. His idealised classic figures harmonise better with this kind of idea in painting; still, this is a beautiful little composition, surpassed however by that in the next room, "The Year's at the Spring" (88), where two or three girls in costume which belongs to no special time or place, followed by lambs, walk over a sunlit rising ground, the brightness of which is emphasised by the bit of dark blue distance beyond. This picture is quite a poem of springtime. Mr. Orchardson's small work "The Lyric" (89), a girl seated before one of the old pianofortes in upright harp form, the only thing he exhibits this year except portraits, shows the style of a master of this kind of subject, but is not otherwise of importance. Mr. Clausen's "In the Beanfield" (94) with its foreground figures and beautifully indicated distance, is pretty nearly a repetition of a former work, but pleasant to meet nevertheless. Mr. Lomax's "Hence to Mr. So-and-So, the poet's, where we heard the latest lampoon and had some excellent madeira" (147), is on a much smaller scale than any of his work that we remember before—a highly finished interior of the Queen Anne or late Jacobean period, which for the kind of thing is about as good as it could be in the accessories, and the characterisation of the figures. The artist seems to be taking to this miniature style; he has another in Gallery IX., "The Collector" (729), also very good. In the second room Miss Catherine Wood shows her accomplished hand in the painting of still life (149), and Mr. Swan's "The Young Bathers" (165) is an excellent example of his power in painting the nude figure on a small scale.

Mr. Watts's "Lilian" (179) in Gallery III. should indeed have been mentioned among the more important works of the year in our first article; it is a life-size three-quarter length of a young girl with a lovely expression, facing the spectator, and holding a quantity of bright flowers in the two hands dropped in front, which are an important element in the picture, the great interest of which is as a study of colour. Mr. Walter Donne's large painting, "Golden Dawn" (176), is a picture to be looked at, though it is a little too scenic in effect; the foreground is a small city with a bronze figure on a high terrace on the right; behind, the sea and high cliffs are bright in morning sun, the foreground being in shadow; the whole thing looks a little too "contrived"; still, it has an effect. Mr. Gow's "Farewell to Nelson" (211), who comes down the stairs to the man-of-war's boat at Portsmouth, is real enough of its kind, but the artist has done better things. Mr. Ralph Peacock, who a year or two back made a kind of *début* as a painter of child portraits, paints this year a lovely little naked infant, a kind of allegory of life, sitting among hill's and turning up a surprised face; the title is "Out of Everywhere into Here" (228), and as a matter of beauty and expression it is certainly far superior to Mr. Watts's leathery-looking child in the New Gallery who asks the question, "Whence? Whither?" In Gallery III. is also M. Bouguereau's correct, cold, and dead religious painting, "Ora pro nobis" (217). One really wonders how any one can be such an accomplished master as M. Bouguereau in his own way is, and yet succeed only in producing pictures that no one can care for or be moved by. A matter-of-fact temperament, which treats poetic subjects without poetic feeling, may be one reason; an entire want of feeling for colour seems to be another. The provoking thing is that in a certain sense his works are so good, so completely those of a master of his craft; and yet—after seeing one we never want to see another. There is another large religious picture this year, by Mr. Abbey, "The Central Panel of a Reredos for the Church of the Holy Trinity, Paris" (361). This is frankly a decorative ecclesiastical picture; the figure of the crucified Christ in the centre, and the two Marys (we presume) one on each side, the whole on a gold background partly diversified with raised decoration. It is a kind of work with which we have no sympathy, and almost regret to find Mr. Abbey engaged in; but it has this difference from M. Bouguereau's picture, that it has beauty of colour, and that it gives the impression, at all events, of being painted with sincerity, while the French artist's treatment of his subject is purely academic.

In Gallery III. we are very glad to see an important work by Mr. Bacon, which looks as if this artist was now going to redeem the great promise which he gave in his first exhibited works; though this is a work of a very different class from those, it is thoroughly original, and shows great power of execution. It is called "A Voice" (207), and represents a garden *fête* one knows not where—perhaps in Germany in the eighteenth century, where various figures scattered about, some military, are supposed all to be listening to the "voice" of a lady singer in centre of the scene. The figure of the singer, in full light, and painted with great force, though only in the middle distance, seems to dominate the scene just as her voice is supposed to do; there is a great deal of curious and elaborate detail in the picture, all of which will bear looking into; it is not a work that would be generally attractive—its point is not immediately obvious, but it is a picture of quite exceptional talent. Mr. Bacon has another very clever picture, an interior with three figures of the Jane Austen period (489); the two ladies might almost pass for Miss Tilney and Catherine Morland. If Mr. Bacon, with this kind of talent to draw upon, would only take to illustrating Jane Austen, he might find a wide and nearly new field before him.

Mr. Nowell's "Isabella and the Pot of Basil" (292) is a good painting in itself, but the long-necked lady in the crimson dress who kneels before the flower-pot is not Keats's heroine, "poor, simple Isabel"; she is too mature both in age and expression, and as an illustration of the well-worn subject it is a failure. Mrs. Normand's "Songs of the Morning" (391), a life size nude or nearly nude nymph crowned with flowers and singing, is exceedingly graceful and pretty, but in colour something too luscious, and the tones of the green in the foreground foliage are not comfortable. In "A Winter Day in Norway" (394) Mr. Thaulow repeats with his usual success an effect which he has made his own. Mr. Melton Fisher's "My Lady's Toilet" (401) is an interior with two figures, very fine in colour if rather pointless otherwise. Mr. Herbert Dicksee's "The Destroyers" (404) are good solid well-painted tigers. Mr. Goodwin has painted a half symbolical picture, "The Invincible Armada" (410); the wrecks of some of the Spanish ships on a flat shore with a red (rather too red) sunset in the rear. We can hardly think it one of the artist's successes; and the theme is a rather hackneyed one. Mr. Logsdail's "Death and the Woodcutter" (414), a rather new line of subject for him, is a very clever work with a grim humour in it. Mr. H. W. B. Davis's "Mares of the Boulonnais" (420), foreground animals and distant coastline, is the best of his works this year. Mr. Walter West's "A Long Story" (430) is an admirable example of his faculty of making a fine picture out of an interior and rich costumes; the young lady in the foreground is a charming figure too. If Mr. West could only put a little more subject into his pictures he would go farther; as it is, they are simply *choses vues*, symphonies of colour and texture, but that kind of thing will not retain the same interest permanently. Mr. Byam Shaw's "Now is the Pilgrim year fair Autumn's charge" (441) has on the other hand almost too much of meaning; the figures are all symbols, and one does not know whether to regard it for the composition or for the meaning. It is a seriously intended work, but rather heavy in style, and can hardly be called a success. Near this is one of those moral lesson pictures of which there are one or two every year; the old story of "The Gambler's Victim" (457)—the packs of cards, the early morning light, the fleeced and repentant youth, etc. Painters must be hard up for subjects when they take to this kind of twaddle, though it has one recommendation, no doubt—it is a kind of picture the Academy crowd can understand.

Gallery IX. contains a beautifully drawn little nymph by the President, "The Sea-Cave" (586). Among other things in this room we notice two slightly painted works which nevertheless give some promise of a new painter of ships and sea—"A Fair Breeze" and "The End of the Voyage" (612, 636); they are small and rather sketchy pictures, by Mr. Frank Kelsey, but his ships sail well. In Gallery X. is a good little architectural picture by Mr. Fred Hall, "An Old Waterway" (797), a night scene on a canal in an ancient city, and Mr. Charles Sims's bright and breezy picture "Butterflies" (807), which are chased by a girl and small boy across an open down. Gallery XI. has also its architectural picture, a more important one, "St. Paul's Cathedral" (834) seen from the river, by Mr. W. L. Wyllie; and for once we get a painter's St. Paul's with the

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dome drawn in perspective. The dome is, however, a little too high in proportion and with too pointed an outline, but it is a much better architectural representation of St. Paul's than one generally sees in a picture exhibition. Mr. Wardle's "Fate" (840), a leopard with its forepaws on a bird, and with a kind of humorous or mischievous expression which is really to be seen in wild animals sometimes when they have caught their prey, is a very clever animal painting, though whether it was a picture to purchase with the Chantrey fund is a question. Mr. Dollman's "Famine" (847), symbolised by a gaunt draped figure in the middle of a desert, over which stream hordes of wolves, is a powerful and impressive picture. The catalogue of the oil paintings concludes with a decorative design for a frieze, by Mr. Ernest Normand, from "Lancelot and Elaine"—the boat with the dead girl and the dumb rower passing along the stream; a subject which lends itself well to the long horizontal composition required for a frieze.

LETTER FROM PARIS.

ON Saturday last the Société des Artistes Français (Old Salon) proceeded to vote for the awards of the medals of honour to exhibitors in the sections of painting, sculpture, architecture, and engraving. In painting, owing to the indecisive character of the voting, the medal was not awarded. M. Henri Martin obtained the highest number of votes, 146 out of 355 voting, and M. Toudouze came second with 88 votes, but neither of these formed a sufficient proportion to justify the award of the medal. In sculpture, M. Just Becquet, a very old exhibitor, obtained the much-coveted distinction. His "Joseph en Egypte," a very beautiful work which we had not space to mention in our review of the Salon, had already been purchased by the Government. M. Becquet was a pupil of Rude, whose sculptural traditions he preserved, and the choice is thought to be a very fitting though rather tardy recognition of an artist who has produced many admirable works, a considerable proportion of which are to be found in various art-museums in France. The Luxembourg possesses two, "Ishmael" and St. Sebastian"; and his "Fawn and Panther" is in the museum at Tours. He executed a statue of La Bruyère for the Hôtel de Ville, and one of Victor Cousin for the Ecole Normale; and his "Vendangeur" decorates the garden of the Tuileries. He had recently executed for the Bibliothèque Nationale a statue symbolising "La Numismatique." M. Becquet had received ordinary medals in the salons of 1867, 1870, 1877, 1878, and 1889, and a gold medal in the great exhibition of 1900. In architecture the medal has naturally been awarded to M. Patouillard for his splendid series of drawings and restorations of the Tiber Island, described at some length in our article on "Architecture at the Paris Salon" (May 14); M. Patouillard had, in fact, practically no competitor for the medal. M. René Patouillard is a pupil of M. Ginain; he obtained the Prix de Rome in Architecture in 1895, and a medal of the second class in 1900. The medal for engraving was awarded to M. Muller, who was a pupil of Boilvin and Lalouze.

M. Guillaume, the Director of the French School at Rome, is now very old, and there is talk at the Académie des Beaux-Arts of his retirement in favour of a new appointment. M. Bouguereau, whose name has been mentioned, is also objected to on the score of age; M. Detaille, also spoken of, seems to be unwilling to accept a post which, though honourable and important, involves banishment from Paris; and several artists think that architects ought to have their turn. In that case, M. Pascal or M. Nénot would probably have the best chance; the latter more particularly, since he is an energetic and still a young man, and has shown distinguished ability in the carrying out of the great building for the new Sorbonne.

The Petit Palais has received a new collection offered by M. Hœutschel, consisting of the works of the sculptor Jean Carriès, who died a few years ago in the midst of his artistic career. The collection includes busts, groups in the round, bas-reliefs, and some curious ceramic work, and will occupy a gallery next to that of the Dutuit collection, which has also been enlarged by the addition of about a hundred pieces of Italian faience presented by Mme. Dutuit. In the same building, in the ground floor galleries, there will also be exhibited shortly the numerous objects discovered by M. Gayet in the excavations at Antinoé. These excavations have been carried out at the cost of the Société Française Archéologique, recently founded, and which desires to take the position now taken by similar societies in other countries. Up to the present time the French Government has had the sole charge of all scientific missions, but the funds at its disposal for such purposes are necessarily limited, and it is hoped that the establishment of the Societé Archéologique will give an important impulse to French archæological undertakings.

Among the architectural work in hand or recently executed on public monuments must be specially noticed the completion by M. Redon of the interior of the Pavillon Marsan at the Louvre, which has been going on for some months past. The old staircase built by Lefuel has disappeared, and on its former site there has been introduced, on the first floor level, a gallery of splendid proportions, reached by two side staircases. This lofty gallery has two balconies in carved stone, at the second floor level. It is lighted by glass panels in the ceiling, and gives access to two other large square galleries opening out of it, and which are arranged so as to afford an interior vista from the existing galleries of the Musée des Arts Décoratifs to the Rue des Tuileries, forming a fine effect as well as an important practical addition to the museum.

At the Gobelins they are working on a great series of tapestries in the style of the XVIIIth century, designed by M. Albert Maignan and intended for the Luxembourg Museum. The first of the series, "Apollo and Daphne," is finished, the second, "Venus Weeping for the Death of Adonis," is in process of manufacture. The whole series, to consist of eight pieces, will take four or five years to complete.

Among the smaller exhibitions is that of the pictures and studies of J. Jacques Rousseau, the result of a tour in the neighbourhood of Anam and Tonkin, and which includes many striking and effective views of the ancient architecture of the country. Another interesting exhibition, which however has just closed, has been that of the works of the late painter Romain Cazes, who was the favourite pupil and disciple of Ingres, and reproduced faithfully his master's learned but cold and academic style.

The competition in "Balcons Fleuris," organised by the "Société du Nouveau Paris," for the most effective arrangement of balcony flower gardens, is now over, and the jury have awarded a sufficient number of prizes. The idea was a happy one, but for the future, if this method of decorating the Paris streets is to have the best practical result, the architects ought to bring their co-operation. The façades of new houses would have to be designed with some reference to this flower-decoration scheme, with projections which would afford supports for an arrangement of flowers in harmony with the lines of the architecture. The first competition may have its results, however, especially if it leads to the horticulturists and the architects putting their heads together to produce the best effect. The idea may very likely become popular; in the present competition the jury, presided over by M. Frantz Jourdain, had to consider and pronounce upon no less than two hundred rival schemes.

The death is announced, at the age of 77, of M. Tabrich, a sculptor who has always been a member of the Société des Artistes Français, though he never exhibited there, having devoted himself to a special class of work—viz., the production of anatomical models in wax, which he modelled and coloured with extraordinary truthfulness, and for which he obtained a legitimate reputation. If the highest object of art were the imitation of nature, M. Tabrich might have been said to have surpassed every one else in the realistic perfection of the models which he made for the Faculté de Médicine of Paris.

The death is also announced, at the age of 55, of M. Lucien Sergent, the painter of battle scenes, and who exhibited this year at the Salon two pictures, one representing Ney charging at the head of French cuirassiers at Waterloo*, the other entitled "La Surprise." M. Sergent was a pupil of Pils and of M. Jean Paul Laurens.

The death is also announced, at the age of 85, of M. Joseph Verdier, the landscape-painter, who was a pupil of Rosa Bonheur, and was President of the "Société des Amis des Arts" of Loir-et-Cher. Several of his works are in the Art Museum at Blois.

*This was mentioned in our review of "French Painting and Sculpture of the Year" (May 21). We hear with great regret of the death of this talented artist, who rather stood alone among French military painters. He did not produce large and popular canvases, but his small works showed remarkable originality of conception and a power of realising the facts of a scene in which he was hardly equalled by any other battle-painter of the day. In a former year, the writer of this note drew attention, in the *Fortnightly Review*, to Sergent's remarkable picture of Napoléon, as a young commander at the battle of Marengo, sitting on a bank at the road-side waiting for his reserves to come up—"Attendant sa Réserve" was the title. It was one of the most real and living pictures we ever saw as an illustration of Napoléon's career.—Ed.

THERMIT WELDING.

THE new process of welding which is now coming into use in this country—at present chiefly in connexion with tramway rails—is the invention of Dr. Hans Goldschmidt, and is based on the intense heat developed by the combustion of aluminium. The term "thermit"—literally translated, "with heat"—is the name applied by the inventor to a mixture of aluminium and oxide of iron in a granular state, and in chemical proportion. This mixture cannot be ignited by ordinary means. It may be stirred by a red-hot bar of iron, or thrown into a fire, or molten cast-iron may be poured on it without causing ignition. But if even a small portion of the mixture be raised to a temperature nearly approaching that of molten steel the chemical affinity of the aluminium for the oxygen contained in the ferric oxide is powerfully developed, with the result that metallic iron and oxide of aluminium are produced, the conversion being attended with intense heat. The temperature so attained, being at about 3,000 deg. C, makes perfectly easy the performance of operations that previously were only possible by the aid of the electric furnace, and still others to which the electric furnace cannot be conveniently applied.

Although the enormous temperature developed by the combustion of aluminium in oxygen, or when mixed with any substance containing oxygen has long been known by chemists, scarcely any attempt was made to utilise the heat so generated until Dr. Goldschmidt's process was introduced. It is true that in 1894 Claude Vautin patented a very similar process, and that Robert Diessler, in Germany, employed the heat resulting from the reaction as a means for heating up metal, but in neither case was the idea developed on commercial lines.

Dr. Goldschmidt, however, has evinced considerable activity in the evolution of auxiliary inventions having for their object the utilisation of the heat of the chemical reaction, or of the product of the reaction, or of both. To illustrate the practical utility of these supplementary inventions, we may point out that thermit can now be used for the following, among other purposes:—

(1) In iron and steel casting, for the prevention of blowholes and cracks, for eliminating impurities and rendering the metal more fluid. It is also easy to produce small mild steel or weld-iron castings most expeditiously by the aid of thermit.

(2) In making steel ingots, for the prevention of "piping," thus making it possible to fill the moulds nearly to the neck with steel of uniform density.

(3) In repairing iron castings, by running on new metal to replace that broken off, or by welding on new parts.

(4) In jointing pipes, by joining up separate lengths to form a continuous pipe line.

(5) In jointing rolled sections, by welding the ends together. Beams, angle, tee, and channel bars, rails, and all other rolled sections can be treated in this way.

Before discussing such of the foregoing applications of thermit, as are more especially connected with structural practice, we will briefly describe the manner in which the mixture is treated as a preliminary to its practical employment.

In the first place a sufficient quantity of thermit is placed in a small crucible, and is fired by means of special ignition powder ignited by an ordinary fusee. The reaction described above then takes place, and the contents of the crucible are resolved into two layers, the upper consisting of aluminium oxide and the lower of iron. The latter product may vary from the state of pure iron to that of mild steel, according to the proportion of carbon present, and it may, of course, be an alloy of iron or steel with manganese, nickel, and other

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metals, if such be present in the original ingredients of the thermit mixture.

The crucible may be emptied in two different ways—either by pouring from the top, in which case the slag flows first, or by drawing through a hole in the bottom of the crucible, when the iron flows first and is followed by the slag.

In deciding which of these methods shall be followed, it is necessary to consider the purpose for which the material is to be applied. When the slag is poured first, it forms a layer upon the object, thus protecting it in a measure from the molten iron which follows. Hence the iron can be applied to hollow forms of manufactured iron without burning them through. Hence for making welded joints to connect iron or steel pipes this mode of pouring is the most suitable. It is equally well adapted for making butt joints between angle and other rolled bars of small dimensions. The process of welding is very simple, all that is necessary being to clean the surfaces, to place a mould around the parts, and to pour into it the contents of the crucible. Welds so made are of equal strength with the remainder of the metal.

When the thermit iron is drawn from the bottom of the crucible it flows at so high a temperature as to melt the surface of the metal with which it comes in contact and to amalgamate with it, so as to form a homogeneous mass. This method is the best for welding tramway rails and for repairing faulty or broken castings, as well as for various other purposes of similar character.

In some cases, however, thermit can be used without the aid of a crucible. For instance, a boss can be cast upon an iron casting by forming a mould in the required place, and then, having poured a thin layer of molten iron upon the surface, thermit is added and ignited. Sufficient cast-iron or steel is then poured into the mould to form the boss. In this way cast-iron can be joined to steel or steel to cast-iron.

As mentioned at the commencement of this article, the use of thermit in this country has been chiefly exemplified in the welding of tramway rails. Such joints are now being regularly made by the Leeds Corporation, and during the last summer meeting of the Institution of Mechanical Engineers we had an opportunity of obtaining full particulars of the process as adopted in Leeds. From tests made by the Corporation engineers, it is evident that thermit joints are far stiffer than those made in the usual manner, and that electrical conductivity is better than that of the unjointed rail. It must also be evident that considerable injury to the rolling stock, as well as to the nervous systems of passengers, must be avoided by the smooth running of vehicles over the continuously jointed rails, for the persistent hammering and jolting due to incompletely connected rail ends are entirely obviated.

From the foregoing outline, it should be evident that the possibilities of thermit welding are very great. We commend the process to the serious consideration of our readers, feeling sure that they will be able to find for it many useful applications in connexion with structural and kindred work.

TAVISTOCK-ROW AND RECENT CHANGES IN COVENT GARDEN.

THE new buildings which have just been erected for the Duke of Bedford after designs by Messrs. Lander, Bedells, and Crompton, in the later English Renaissance manner, for the foreign flower traffic, stand upon the site of Tavistock-row. The Row, consisting of fourteen houses, was erected after the demolition in 1704 of Bedford, or Russell, House, the town mansion of William, first Duke of Bedford, to whom King Charles II. granted a charter of right in freehold to establish a fruit and vegetable market within the area which had been a pleasaunce and herbarium, the Frère Pye Garden, of the monks of Westminster. On that side of the convent garden lay the north wall, having two bastions, of the gardens of Bedford House (Southampton-street). The Duke's gardens extended from the east end of Maiden-lane to his stables, from which they were separated by a passage—since Tavistock-court—between the new buildings we mention and the market-house, which was built nearly twenty years ago on the site of the stables and of Nos. 1-3, Tavistock-row. Tavistock-street has supplanted the carriage-way leading from the courtyard of the house to the stables, which had two gates at the elbow of Charles (since Wellington) and York streets and in Exeter-street. Tavistock-row was pulled down in 1885; in December of that year was standing the last remaining house, No. 13, where had lodged Zincke, the famous enameller and miniature painter, Nathaniel Dance, and Dr. Wolcott, who there, in a garret, began his literary career as "Peter Pindar." At No. 4, at the north-west corner of Tavistock-court, illustrated in the *Builder* of April 15, 1876, Charles Macklin, the veteran of the stage, passed the closing years of his life. In the adjoining house, No. 5, lived and died (1707) William Vandevelde the younger and Thomas Major, engraver to the Court and the Stamp Office, who in 1784 furnished in less than twenty hours a perfect substitute in brass of the Great Seal stolen from Lord Chancellor Thurlow's house in Great Ormond-street. The north side of Tavistock-street was pulled down in 1887.

In the south-east corner of the square, and opposite Tavistock-row, stood Tom King's coffee-house, which Hogarth, in his print—the view is reversed—of "Morning," depicts as in front of the portico of St. Paul's Church, and its equally notorious compeer, Mrs. Butler's "Finish," also the new "Hummums," pulled down in January, 1886, for the flower-market house, and the place where Powell exhibited his puppet-show of "Punchinello," mentioned by Steele in No. 14 of the *Spectator*, March 16, 1711. A good view of the Row is drawn in Canale's large picture, painted in or about 1750, of the market, which was sold at Christie's auction-rooms on July 7, 1888; it shows the red-brick houses before their fronts were covered with stucco and otherwise modernised, and before the balustrade was added in front of the attics on the fifth story.

THE SURVEYORS' INSTITUTION:

MEETING IN NEWCASTLE-ON-TYNE.

A COUNTRY meeting of the Surveyors' Institution was held in Newcastle last week, the members being welcomed on their arrival by the local committee at the County Hotel, which were the headquarters of the Institution during the visit. The Mayor and Corporation granted the use of the Council Chamber for the reception, and the North of England Institute of Mining and Mechanical Engineers the use of their Lecture Theatre in Neville-street for the subsequent meetings. On the 26th ult. there was a municipal welcome in the Council Chamber; and afterwards the members adjourned to the lecture theatre of the North of England Institute of Mining and Mechanical Engineers, where the President, Mr. A. Buck, took the chair. The remainder of the morning was devoted to the reading and discussion of papers.

The President said he regretted the absence of the Secretary (Mr. Julian C. Rogers) in consequence of an accident.

Mr. Richard Welford, M.A., delivered a lecture on old Newcastle. On the motion of Mr. H. T. Steward (President-elect), seconded by Mr. J. M. Clark (Haltwhistle), Mr. Welford was heartily thanked for his paper.

Re-housing.

Mr. Edgar J. Harper, professional Associate, contributed a paper on "The Re-housing of Displaced Populations." He referred to the law affecting the provision of accommodation for displaced persons of the working class, and said that Parliament had now declared that all displacements must be accompanied by the provision of new accommodation, and had indicated the suburbs rather than the busy centres as the proper locality for such accommodation. A great deal, however, still remained to be done in the direction of securing adequate provision for working class populations compulsorily displaced.

"In the session of 1902 a Joint Select Committee was appointed by both Houses of Parliament to consider and report whether any amendments should be made in the Standing Orders and Model Clauses relating to displacements of persons of the labouring classes, and especially whether any and what provision should be made for re-housing *all such persons*, if displaced. That Committee reported in favour of abolishing the limit of twenty houses in a parish and substituting one of thirty persons in a borough, urban district, or rural parish. They recommended that the new houses should not be too ambitious in character and design, and that the location of such houses should be left wholly to the discretion of the Government department concerned. It is clear, moreover, that they contemplated the erection of buildings some distance away from the area of clearance. They further recommend that the Government department should be empowered to *fix rents* for new houses thus provided, and that an amended model clause should be embodied in an Act of Parliament. The result was the passing of the Housing of the Working Classes Act, 1903, which adopted the substitution of thirty persons for twenty houses as the limit above which provision must be made for re-housing, and embodied a model clause as a schedule to the Act. The suggestion that the Government should fix the rents of dwellings was not adopted. Further amendments contained in the Act are:—

"(1) The extension of the maximum period for which money may be borrowed by a local authority for housing purposes from sixty to eighty years.

"(2) The Government department is empowered to take into consideration the displacement of persons of the working classes from a scheduled area within five years previous to its acquisition.

"[This is necessary in order to prevent arrangements whereby owners might be induced to get rid of their tenants and enable promoters to escape the re-housing obligation by selling to them with vacant possession.]

"(3) The Government department may also require that all or some of the new dwellings shall be fit for occupation before the displacement takes place.

"By far the most important of these reforms are the discretion of the Government department as to the locality of the re-housing and the abolition of the twenty houses limit. It may be broadly stated that Parliament has now declared that all displacements must be accompanied by the provision of new accommodation; and has indicated the suburbs rather than the busy centres as the proper locality for such accommodation. The beneficial effect of these two changes can hardly be over-estimated. In any important town in the kingdom displacements usually occur in the central and fully built-up districts. The compulsion to devote the cleared sites to the erection of dwellings often involved considerable pecuniary sacrifice. Land thus situated is much more valuable for commercial purposes than for housing; and the difference between its commercial value and its housing value had to be written off as a dead loss before the provision of new dwellings could be commenced. In one case in London this loss amounted to over 200*l.* her head of the persons to be accommodated on the site.

"This enormous sacrifice had to be made apparently without purpose, and certainly without securing any desirable object. Insanitary areas are cleared as a general rule because they are condemned by competent persons as unfit for residential purposes; and therefore, so far as the public health is concerned, the erection of dwellings on these areas is obviously undesirable. And if the intention was to accommodate the actual individuals who were displaced, it is now notorious that—but for a few exceptional cases—the idea proved a complete failure. But perhaps the worst result of the old policy was the serious obstacle it placed in the way of the material progress of the community by diverting land from its most profitable use and tying it up for another purpose, for which the march of events was year by year tending to make it less suitable.

"The twenty-house limit was liable to serious abuse. It was obviously possible to obtain statutory authority to displace a large population, without incurring any obligation, by limiting the number of houses scheduled in any one parish to nineteen; and, apart from profit-earning companies, it may be mentioned that a public body (now no longer in existence) succumbed to the temptation on one occasion. It will be noticed, too, that the new limit of thirty persons does not apply, as formerly, to a single parish, except in the rural districts; and a railway company which proposes to displace thirty persons in any part of the county of London, or in any borough or urban district, comes at once under the re-housing obligation. . . .

"A very great deal remains to be done in the direction of securing adequate provision for

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working class populations compulsorily displaced. Except Part III. of the Act of 1890, as extended by the Act of 1900, there is still no means of securing adequate housing accommodation in lieu of displacements by closing orders and by private enterprise, and this appears to be one of the strongest arguments in favour of municipal action in the direction of providing such accommodation.

"This is a matter affecting the health and moral character of the most numerous class in the population. Private enterprise is after all a matter of supply and demand, and if it is more profitable to build houses for the middle and upper classes, the housing provision for the proletariat may, and often does, come short. Thus we find thousands of poor families living in houses never intended for such use, and unprovided with adequate sanitary arrangements. In such a case it is difficult to see what satisfactory argument can be advanced against the conclusion that the necessary provision should be made by a public authority.

"In this connexion it may be useful to point out that a public authority is at least better fitted to provide housing accommodation than, let us say, a railway company. The chief aims of a railway company are to provide means of transit for the public, and—if possible—to earn dividends for its shareholders. It possesses no experience of the housing problem, no machinery for grappling with it. Yet Parliament decrees that it shall bear the responsibility of providing accommodation for persons displaced, often delaying its railway operations in the process. Some provision whereby the re-housing obligation could be transferred to a public authority—of course coupled with adequate pecuniary arrangements—would probably prove beneficial to all parties concerned. . . ."

Mr. Henry J. Potter, A.R.I.B.A., also read a paper on "The Housing of the Working Classes." He referred to the schemes for the laying out of estates for the erection of small houses, especially where the owner was the builder, and pleaded that it was not always necessary, by reducing the frontage allowed for each house, to squeeze as many houses as possible in a given area. The increased frontage, he said, and the consequent removal of the compartments forming the outbuildings, to a position under the main roof immensely improved the aspect from the back windows, permitted of a better circulation of air, and in certain aspects allowed the sun to penetrate a window where a shadow would otherwise have fallen. It provided also a means of contending against the difficulty of providing a sunny aspect for all living rooms, and that he feared was frequently shirked by architects.

Mr. W. Woodward said, on the question whether municipal bodies should undertake the building of dwellings for working people, he thought himself that, if the Building Acts were not so stringent, private enterprise would provide equal accommodation at a much lower rent than was possible under municipal control. The municipalities employed men who did not carry out their part of the bargain; and the great cost of dwellings for the working classes when the work was undertaken by municipal authorities, and the inability to provide rooms at a small rent, were consequent on the organised idleness of the very workmen who were proposing to occupy those dwellings.

Mr. J. W. Taylor, commenting upon the papers, and especially Mr. Potter's, said the plans sketched by the reader of the paper would not on any account be allowed in Newcastle by the local authority. The custom there was to have a back street, varying in width from 12 to 24 ft. The back street was for the passage of carts, for drainage and sewers; and the houses were usually two-story flats or tenements. The frontage varied from 19 to 22 ft. These houses were decent and sanitary, and were a good investment, paying as much as 6 per cent. if they were bought when the market was not inflated. These and the tramway system were solving the housing problem. They urged that workmen should become the owners of their own houses, because it gave them a larger stake in the country. The back to back house was insanitary.

Mr. A. M. Fowler (Manchester) denied that the back to back house was insanitary. The modern back-to-back dwelling was very different from the old rookeries that had been cleared away. There was not a town in England or in Europe that was built up like Leeds. Nor was there a town where the workmen were of such moral character. The Imperial Building Society turned over five millions a year in providing working men with their own dwellings. The working men owned their own dwellings, and paid only four shillings a week, whereas they would have to pay a landlord four shillings and threepence. He suggested that municipalities should assist working men to buy their own houses, and thus to become better citizens. They would never solve the housing problem until they made the workman feel that he belonged to the soil. He would have a bath in every house.

The President referred to the building of dwellings for agricultural labourers, in which he was concerned. It was necessary to provide houses of which the rent was a certain proportion of the wages earned by the workman. Thus it was a very difficult problem to build cottages which would not be a loss. There was no doubt that many labourers had left the country and come into the towns because their dwellings got into a bad state; and, if homes were made pleasant, they would not leave them.

Mr. J. Smith Hill, B.A., B.Sc., London (Associate), contributed a paper on "Agriculture in Cumberland."

A vote of thanks to the authors of the papers was heartily given.

Ancient Lights.

Mr. H. T. Steward expressed his regret that they could not have a paper on ancient lights—a question in which many of them had taken a deep interest. The House of Lords' decision had told them what the law was in the matter; and he could not help thinking it would be a great benefit to Newcastle, and to them in London and elsewhere. The Surveyors' Institution, in conjunction with the Royal Institute of British Architects, had been for some time engaged in framing a Bill which they had presented to Parliament this year. What was the exact position of the Bill, in the congested state of Parliament, he could not say; but he did not think there was much chance for it this year. They wanted to express in the Bill that the decision of the House of Lords was the law on the question.

The conference then adjourned.

The afternoon was devoted to visits to places of interest in the neighbourhood.

The members dined together in the evening in the County Hotel, Newcastle. Mr. Albert Buck (President) was in the chair, and was supported on the right by the Right Hon. Lord Armstrong, Mr. Herbert T. Steward (President-elect), the Sheriff of Newcastle (Mr. W. Cowell), Mr. G. Langridge, Mr. Howard Martin, the Rev. Principal Gurney, Mr. Edward Woolley, Mr. C. E. Carr, Mr. F. J. Edge (City Engineer), Mr. Tom Birkett, Mr. F. H. Holford (City Surveyor); and on the left by the Deputy Mayor (Ald. Jno. Goolden), the Hon. E. G. Strutt, Mr. Geo. Renwick, M.P., Mr. C. Bidwell, Sir Jacob Wilson, Mr. R. Horsfall, Ald. L. H. Armour (representing the Mayor of Gateshead), Mr. H. Chatfeild Clarke, Mr. James Walker (engineer to the River Tyne Commissioners), Ald. T. S. Carrick, Mr. G. M. Freeman, K.C., Mr. J. M. Clark, Mr. J. D. Walker (Under Sheriff), Mr. Henry Fowler, and Professor Gilchrist, of the Agricultural department of the Armstrong College.

The loyal toasts, proposed by the President, were cordially honoured, and Sir Jacob Wilson proposed "The Houses of Parliament."

Lord Armstrong and Mr. Geo. Renwick, M.P., responded.

Mr. Herbert T. Steward proposed "The Mayor and Corporation of Newcastle-on-Tyne," and expressed the appreciation of the Institution for the cordial welcome that had been extended to them that morning.

Ald. John Goolden (Deputy Mayor) having responded, Mr. Geo. Renwick, M.P., proposed "The Surveyors' Institution." He noticed that they had been discussing the housing of the displaced population, the housing of the working classes, and kindred questions. He knew they were interested in the question of small holdings, leasehold enfranchisement, and the valuation question. These were all important questions, and they might discuss them with profit. But the majority of the Members of Parliament knew very little about them. He referred to the Bill of Sir John Rolleston for the protection of incorporated chartered societies. That might seem a Bill which was harmless, and which they could all support; but he had letters from his constituents asking him to oppose it. So they saw there were two sides to every question.

The President replied. He said they had visited many towns, but they had never, in any one of them, received a more cordial welcome than they had received in Newcastle. They got great good from those visits, and he hoped they left some good behind them.

The toasts of "The Provincial Committees" and "The Guests" followed.

The following day was devoted to excursions.

Annual General Meeting.

The annual general meeting of the Institution was held on Monday at No. 12, Great George-street, Westminster, Mr. A. Buck, President, in the chair.

Mr. Percivall Currey, Hon. Secretary, read, in the absence of the Secretary, Mr. Julian C. Rogers, the scrutineers' report on the election of President and Council for the ensuing year of office. The new President is Mr. H. T. Steward, and the Vice-Presidents are Messrs. C. Bidwell, G. Langridge, T. T. Wainwright, and J. C. Penfold, late Hon. Secretary.

Mr. Currey also read the thirty-sixth annual report of Council and the statement of receipts and expenditure. The report shows that the present membership of the Institution is 3,560, which is an increase of 117 during the past year. The receipts for the year show, both on capital and income account, a satisfactory increase—the former of 83*l.*, and the latter of nearly 500*l.* The item hire of rooms for arbitrations shows a total of 648*l.*, being 30*l.* more than last year. The income from interest and dividends for the year amounted to 434*l.*, as compared with 373*l.* last year, but the shrinkage in the value of the invested capital, owing to the general depression in securities, has necessitated the writing off, for the purposes of valuation, of about 650*l.* on capital account. Expenditure shows an increase of some 380*l.*, including a payment of nearly 500*l.* for the cleaning and decorating of the principal rooms. There has been again a large increase in the numbers of candidates for the professional examinations, the entries and passes as regards the preliminary examination being practically the same as last year. Of the 480 candidates who presented themselves for the professional examinations, thirty-nine came up for re-examination in the "typical" subject, only one being in the Land Agency Sub-division, seventeen in the Valuation, and twenty-one in the Building and Quantity Surveyors Sub-division. Of these candidates, thirty completed their qualifying examinations by obtaining pass marks in their respective subjects. Among the 441 new candidates who presented themselves this year thirty-three failed to pass in their "typical" subject, although obtaining a sufficient aggregate of marks in the examination as a whole, and were "referred back" for re-examination in that subject. Six of these were in the Land Agency, ten in the Valuation, and seventeen in the Building Sub-division. At the examinations held in Glasgow simultaneously with the English examinations, under the superintendence of Mr. William Fraser and a Committee of Scottish Examiners, five candidates presented themselves in the Land Agency Sub-division and one in the Valuation Sub-division. Of these, five passed. For the Professional Examinations in Dublin, three Land Agency candidates for the Associateship presented themselves, and one Building candidate for the Fellowship, two candidates in the Associateship Division being successful in passing.

The prizes were awarded as follows:—The "Institution" Prize, value 15 guineas, to William Cecil Clemens, a Student Candidate in Sub-division III. (Building), with 795 marks out of 1,000. The "Special" Prize, value 10 guineas, to Charles Frederick Norman, a Student Candidate in Sub-division II. (Valuation), with 785 marks out of 1,000. The "Penfold Gold Medal" to Charles Edwin Widdicombe, a Fellowship Candidate in Sub-division II. (Valuation), with 821 marks out of 1,000. The "Penfold Silver Medal," for the highest proportion of marks in the two sections of the Associateship Examination, and the "Driver" Prize, value 15*l.*, to Gustavus Taylor Loban, a Non-Student Candidate in Sub-division II. (Valuation), with 841 marks out of 1,000. The "Beadle" Prize to Harold Robert Smith, a Non-Student Candidate in Sub-division I. (Land Agency), with 70 per cent. of the maximum marks in the subject "Agriculture." The "Crawter" Prize to Frank George Newnham, Fellowship Candidate in Sub-division II. (Valuations), for the best work in the subject "Principles and Practice of Valuation."

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In last year's report the Council announced a gift by Mr. F. T. Galsworthy of 500*l.* for the endowment of a prize in connexion with the Fellowship Examination, in a form not then determined. It has now been decided, with Mr. Galsworthy's consent, to devote each year's interest to a prize in respect of that year, to be awarded to the Fellowship Candidate who, having passed the Associateship Examination while a student, is found to have obtained the highest number of marks in his Associateship and Fellowship Examinations combined. The amount of the prize is to be devoted (until exhausted) towards the payment of the winner's annual subscriptions, or, under special circumstances, and at his request, partly towards that object, and partly to the purchase of books or scientific instruments. This prize was this year awarded to George Potter Knowles who passed the Associateship Examination as a Student Candidate in 1899, and whose aggregate of marks at that examination and at the Fellowship Examination, 1904, amounted to 1,586, or 79 per cent, of the possible maximum marks in the two examinations. The "Preliminary" Prize was awarded to Sidney Harold Stohwasser, who passed at the head of the list in the Preliminary Examination in January.

"The work of the examiners has been increased this year. The revision of the syllabus and rules of examination has introduced new subjects, and the further division of Subdivision III. into the two branches of Building Surveyors and Quantity Surveyors, each branch having its own special 'typical subject,' also added considerably to the number of papers to be set, and to the amount of work to be adjudicated upon. The resulting addition to the labours of the Honorary Examiners has been very great, and they have again earned the hearty thanks of all who have the interests of professional education at heart.

The Council also desire to express their obligations to the Members of the Local Committees in Glasgow, Dublin, and Manchester, who conducted the Preliminary and Professional Examinations with such careful attention to detail and generous expenditure of time as to ensure their complete success."

An application has been received by the Council from the Senatus of the University of Edinburgh to be included among the places of professional education approved in connexion with preparations for the Professional Examinations of the Institution. The Council have agreed to add the University to the list, subject to certain additions to the present curriculum to cover the requirements of the Institution Examinations. Similar applications have been received from other teaching bodies in England and Scotland, the effect of which will be to link the examination system with all the principal training colleges of the United Kingdom, thus greatly enlarging the opportunities for study available for young surveyors of all classes.

The Council record with deep regret the death of their colleague, Mr. George Spencer Mathews, of Birmingham, whose brother also served for some years on the Council, and whose father was one of the first Vice-Presidents and a Founder-Member of the Institution.

By the death of Mr. Gilbert Murray the Institution has lost a member devoted to its interests, who for many years rendered it valuable service as an examiner in one of the most important subjects, and whose sagacious advice on difficult points of professional practice was always willingly rendered to fellow members.

"Towards the end of last year the Council received with the greatest regret an intimation from Mr. Penfold of his desire to relinquish the office which he has held with such honour to himself and such advantage to the Institution since its establishment thirty-six years ago. A little later on Mr. Penfold will be asked to accept a presentation portrait, painted by Mr. G. P. Jacomb Hood, and subscribed for by a large number of members, when an opportunity will occur of expressing in fuller and more adequate terms the sentiments of cordial regard entertained for Mr. Penfold by the whole body of the members. The Council have been fortunate in securing, in the person of Mr. Percivall Currey, who has been for many years a Fellow of the Institution, and comes of a distinguished family of surveyors, an excellent successor to the office vacated by Mr. Penfold at the beginning of the present year.

'There is evidence of a marked tendency towards an increase in the number of Colonial members, which may be taken as a gratifying proof that the reputation of the Institution is spreading throughout the Empire, especially among persons in official circles, and it may become a question later on whether the Institution should introduce examinations in the Colonies for the admission of the various classes of surveyors not affected by the licensing ordinances of the different Colonial Governments."

The Council have given consideration during the session to the question whether anything further can be done in the interests of Professional Education and generally for the benefit of members, and, with this object in view, have been in communication with the various country committees as to the advisability and practicability of holding, at the expense of the Institution, courses of lectures on suitable subjects at the principal universities and technical institutes in the various provincial centres. Owing mainly to geographical difficulties, many of the committees do not see their way to give practical effect to the proposals, but in some of the larger centres, where the membership is less scattered, it is hoped that some arrangements of the kind may be made during the coming winter.

At the invitation of the London County Council, the Council of the Institution, assisted by a representative committee, have devoted considerable time and labour during the session to the framing of proposals for the amendment of the present London Building Acts. During the progress of the Bill of 1894 through Parliament, the Institution was largely instrumental in greatly modifying (and the Council venture to think improving) its provisions in the form in which the Bill was first introduced, and this being so, the most recent proposals of the Council were necessarily limited to defects in the Act of 1894 which have revealed themselves in practice, to provisions to meet new methods of construction introduced since the passing of the Act, and to the desirability of giving an appeal to the Tribunal created by the Act of 1894 on many points on which a discretionary power at present resides with the superintending architect. It is hoped that some, at any rate, of the suggestions referred to will commend themselves to the London County Council and the Legislature.

An effort will be made during the current session of Parliament to re-introduce the Bill, prepared and promoted by the Institution and the Royal Institute of British Architects, for the amendment of the law as to easements of light, but, like all private Bills, its chances of passing are small, unless the Government can be induced to regard it with a friendly eye. With the same object in view the Council agreed to contribute to the costs of the appellant in the action of Colls *v.* Home and Colonial Stores, in the hope that some recent decisions most adverse to building operations in London, and to the interests of property owners might be over-ruled by the House of Lords. This hope has now been realised, and the result will be regarded with general satisfaction.

The Institution, in common with other bodies incorporated by Royal Charter, has suffered from the unauthorised use by unscrupulous persons of its title and designatory letters. It is too early to make any definite announcement as to the steps being taken to remedy this state of things, but the Council are not without hope that the action which they are taking, in concert with other societies similarly situated, may result in the securing of some measure of protection against this growing evil.

"The Council have felt it their duty to oppose the grant of a licence of incorporation under the Companies Acts to a new body entitling itself the Quantity Surveyors' Association, on the ground that there is no necessity for the establishment of any new society of the kind, as this branch of practice is already adequately represented by the Institution, and enjoys in that connexion every advantage possessed by other classes of members. The Council invited the promoters of the new society to meet them in conference with a view to discovering, if possible, whether there were any respects in which the usefulness of the Institution to the general body of Quantity Surveyors could be increased, hoping in this way to remove any reasonable grounds for the formation of a separate society, but this invitation meeting with no response, it became necessary for the Council to do their utmost for the protection of the interests of the Institution."

The Council are glad to note that a much larger use is being made of the Loan Library as the members come to realise its advantages. During the year 496 works have been issued. The number of members who have made use of the Loan Library has been 196, of whom 93 were town and 103 country members. Steps are taken, from time to time, to multiply the number of copies of books proved to be in considerable request.

There have been some interesting additions to the Forestry Museum, for which the Council are indebted to some of the members specially interested in the subject. It is hoped that it is now fairly representative of the various features of British woodcraft, and at the request of the Royal Agricultural Society of England, the Council have undertaken to send an exhibit to the Show at Park Royal in June next.

During the past year the register has been a means of helping a good many of the younger members to obtain employment, and there is every reason to believe that, as it becomes better known, it will prove still more useful for the purposes for which it is designed.

The report and balance-sheet having been approved and adopted, a vote of thanks to Messrs. Newmarsh and Stanley Hicks, the auditors, was agreed to, and these gentlemen were re-elected.

A vote of thanks was also accorded to the President, Vice-President, and other members and associates of the Council for the manner in which they had administered the affairs of the Institution.

Mr. Stenning then moved that a hearty vote of thanks be accorded to Mr. Currey, the Hon. Secretary, Mr. Julian C. Rogers, the Secretary, and the other officers of the Institution for the able manner in which they had served the Institution.

Mr. Langridge seconded, and expressed the great regret of the meeting in the absence of Mr. Rogers owing to his recent accident.

The motion having been heartily agreed to, Mr. Currey briefly replied, stating that he hoped and believed that Mr. Rogers would soon be able to resumé his duties.

On the motion of Mr. Scoble, a vote of thanks was accorded to the scrutineers, and the President then distributed the prizes to the successful competitors.

On the motion of Mr. H. Chatfeild Clarke, seconded by Mr. Warner, a hearty vote of thanks was passed to the President, and Mr. Buck briefly replied. Mr. Steward, the newly-elected President, was then invested with the chain of office, and, having taken the chair, he thanked the members for the honour they had conferred upon him in electing him as their President.

The proceedings then terminated.

THE CLIFF AUTOMATIC FIRE-HOSE REEL.—This appliance is intended to be attached directly to a water pipe, and the hose coupled directly to a valve fixed in the pipe line. The reel consists of a cast-iron wheel of strong design, and the hose is wound on the reel in single layers one above the other, thus preventing folds or creases and greatly prolonging its life and utility. A great advantage possessed by this appliance is that it is perfectly automatic. The unwinding of the hose in any desired direction opens the valve gradually after 20 ft. of hose has been unwound, but the full supply of water is not obtained until the whole has been unwound. Although the reel does not swing, the hose can be drawn from it in any desired direction, and a stream of water may be directed against any point in a few seconds. On a recent occasion when an outbreak of fire threatened serious damage to the Hamburg Pier, New York, the night watchman was able to extinguish the flames with an appliance of this kind before the arrival of the city firemen; a very fortunate circumstance, as 1,000 barrels of lard were lying on the pier at a short distance from the point where the fire occurred. When once fixed this device is always ready, and can be used by anyone without previous instruction.

MEMORIAL, PETERBOROUGH CATHEDRAL.—At Peterborough Cathedral the Bishop of the Diocese recently dedicated a memorial to the late Dean of Peterborough. The base of the cenotaph was designed by Mr. Bodley, R.A., and the recumbent figure in white Carrara marble was the last work of the late dean's brother, Mr. Walter Rowlands Ingram, who died just after the work was completed.

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ARCHITECTURAL SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—The Seventeenth Annual Report of this Society shows that the number of members is at present 88—viz.: 49 members, 13 associate members, and 26 associates. The Report states that important steps have been taken to improve the ordinary local facilities for architectural education. At a meeting held on July 10 the President reported the result of a conference of presidents of the allied societies which he attended at the Royal Institute upon this question, and the Council entered into communication with the Architectural Association of London and the allied societies of Bristol and Cardiff with a view of co-operation in the provision of lecturers, the Architectural Association being asked if it was deemed feasible to extend its teaching to the provinces in connexion with the local technical schools and colleges; for instance, Exeter, Bristol, and Plymouth might form a district for a visiting teacher. The Architectural Association replied favourably, and the following copy of the report of their Committee was received:—

"Resolved that provincial students be allowed to submit drawings in the School of Design at a fee to non-members of 7s. 6d. per session, members 5s., the drawings to be criticised by the same visitor as in London, and it is proposed that his criticisms of the provincial designs should be written down and signed by him, and that at the end of the session the various societies will arrange for an exhibition of the designs submitted by their members.

"Resolved that a second visitor be appointed to assist if the number of drawings submitted is large, and that one of the visitors should visit one of the provincial societies and take with him some of the best London designs submitted.

"Resolved that it be suggested to the societies that they should institute prizes for their members on similar lines to those given in the Architectural Association School of Design.

"Resolved, with reference to the provision of a paid lecturer, that it would be possible to organise such a scheme by which a lecturer would deliver six lectures per session in each centre, say Cardiff, Devon, Exeter, and Plymouth, on the following subjects:—

1. General History of Architecture.
2. Principles of Design.

The fee suggested is twenty guineas for six lectures, plus the lecturer's expenses.

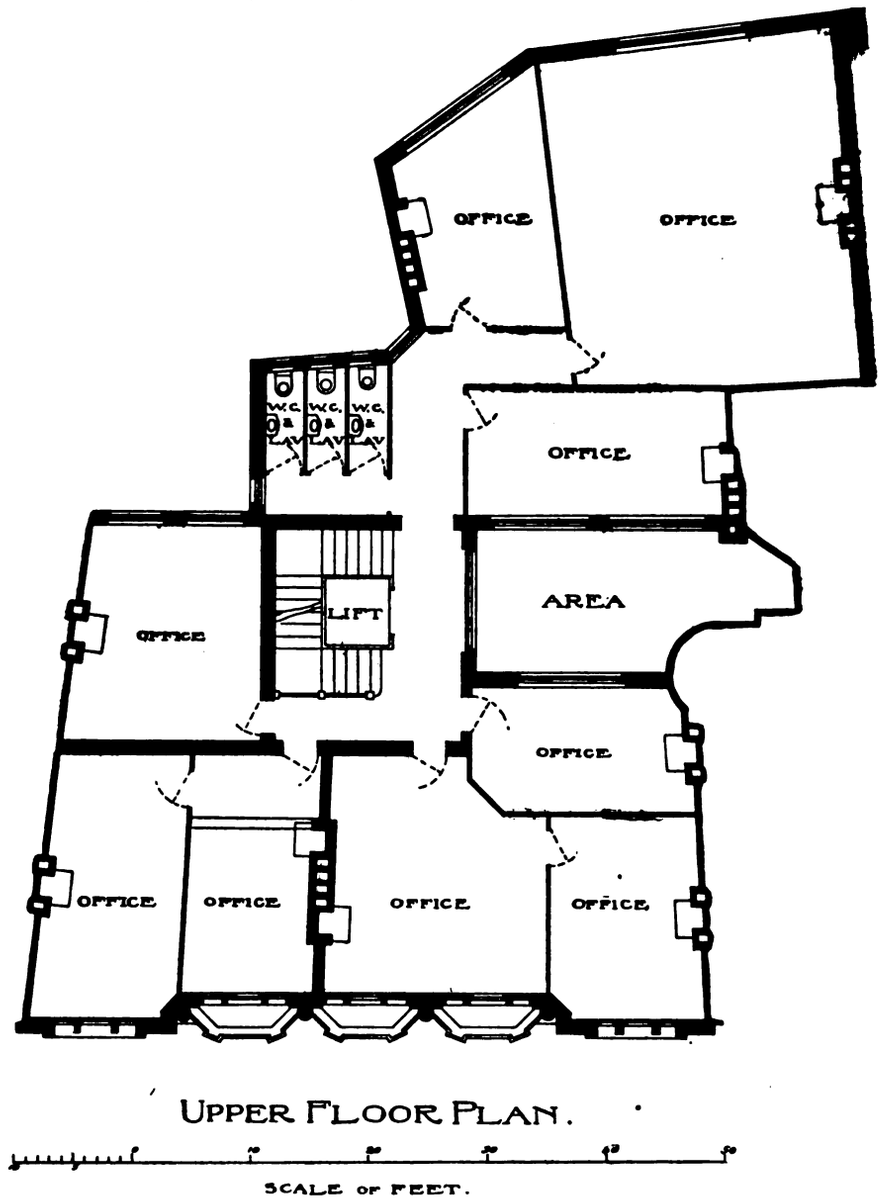
It would be required that provincial societies should pay travelling and hotel expenses to the visitor, or to arrange for his entertainment.

It is understood that the scheme shall be quite self-supporting, and entail no expenses to the Architectural Association."

A circular was then issued to every recognised practising architect in Devon and Cornwall asking whether they approved of and would support the extension to this province of the Architectural Association School of Design and the suggestion of a paid visiting lecturer. Seventy-five circulars were sent out, and twenty-one replies were received, all being in favour. Of the twenty-one principals, nine have no pupils, and the remaining twelve have sixteen pupils. At a general meeting on February 26 it was decided to accept the terms of the Architectural Association enabling their members to join the Class of Design. It was also resolved that further particulars be obtained with regard to the provision of lecturers.

PATENT REMOVABLE WINDOW BARS.—Messrs. Ellen and Co., of Billiter-street, send a description and diagram of their patent window bars, which are held by a fastening rail secured by a padlock, and detachable at pleasure by anyone who has the key. This would hardly do for outside bars, as the lock might be picked; but for bars fixed inside a window it may be a great convenience, as there are often occasions when the bars are for the moment in the way; and to be able to detach them without a lengthened operation of unscrewing and screwing up again may be desirable from time to time. The apparatus seems quite simple, and the bars would be as secure as usual so long as they were locked.

TUDOR HOTEL, OXFORD-STREET.—A novel project is about to be carried out at the Tudor Hotel by the conversion of the flat roof for purposes of an outdoor garden café, to be gained by means of a lift. The hotel is owned by members of the International Society of Waiters, the Geneva Union, and was built, at the corner (east) of Dean-street, a few years ago, after Mr. P. E. Pilditch's plans and designs.



UPPER FLOOR PLAN.

SCALE OF FEET.

Dominion of Canada Emigration Offices.

Illustrations.

SCULPTURE FROM THE ARA PACIS AUGUSTÆ, ROME.

THE reliefs, photographs of which are reproduced in the plate, belong to the wall of blocks of marble which surrounded the Ara Pacis Augustæ in the Campus Martius at Rome. Figs. 1, 2, 4, and 5 belong to the lower portion of the exterior, Fig. 4 having been one of the angle pilasters on the left, while Fig. 5 is precisely similar to the mass of acanthus leaves at the bottom of Fig. 1, but photographed on a larger scale. Figs. 3 and 6 belong to the upper portion, in which were shown two processions advancing to sacrifice; the bearded figure in Fig. 3 is probably a symbolical representation of the Roman senate, while the olive-crowned men in Fig. 6 are some of the immediate attendants of the Emperor—possibly members of his family.

All these fragments have been brought to light by the recent excavations, the first official report of which appeared not long ago in the last number of the *Notizie degli Scavi* (nominally for November, 1903). An account of a lecture on the subject by Mr. Stuart Jones appeared in the *Builder* for March 5 of this year.

DOMINION OF CANADA EMIGRATION OFFICES, CHARING CROSS.

THE front of this building is of Portland stone, the main columns being Red Mansfield, and those in the upper stories grey Scotch granite.

In order to obtain a proper foundation the main piers were carried down to a depth of about 26 ft. below the pavement level.

By an agreement made many years ago, Messrs. Cox, the bankers, adjoining, were entitled to carry up their building at the back to suit their requirements, and the owners of Nos. 11-15 have recently enjoyed the same privilege.

The building was erected by Mr. Henry Lovatt, of Wolverhampton, and Mr. Alfred H. Hart is the architect.

The drawing is exhibited at the Royal Academy.

HOUSE, EGLINTON DRIVE, GLASGOW.

THIS house was built as a town residence for Mr. Thomas Prentice, of Glasgow, and was completed in the summer of last year. A certain Italian feeling has been given to the design in order to be in harmony with the adjoining buildings and at the same time suitable to the locality in which the house is situated.

The external walls are built of local sandstone, and the roofs are covered with sand-faced tiles supplied by the Broseley Tileries Company. The whole is surmounted by a cupola, which lights the upper part of the staircase and landing.

A special feature has been made of the hall of this house by the introduction of intersecting plaster vaults supported on red sandstone Doric columns. The fireplace is also of the same material, with projecting Italian hood, while the steps of the staircase are of solid teak moulded on the under side.

On the first floor are five principal bedrooms, a dressing room, two servants' bedrooms, work room, and two bathrooms, etc. The architect is Mr. A. N. Prentice, of London, who also prepared the accompanying illustration.

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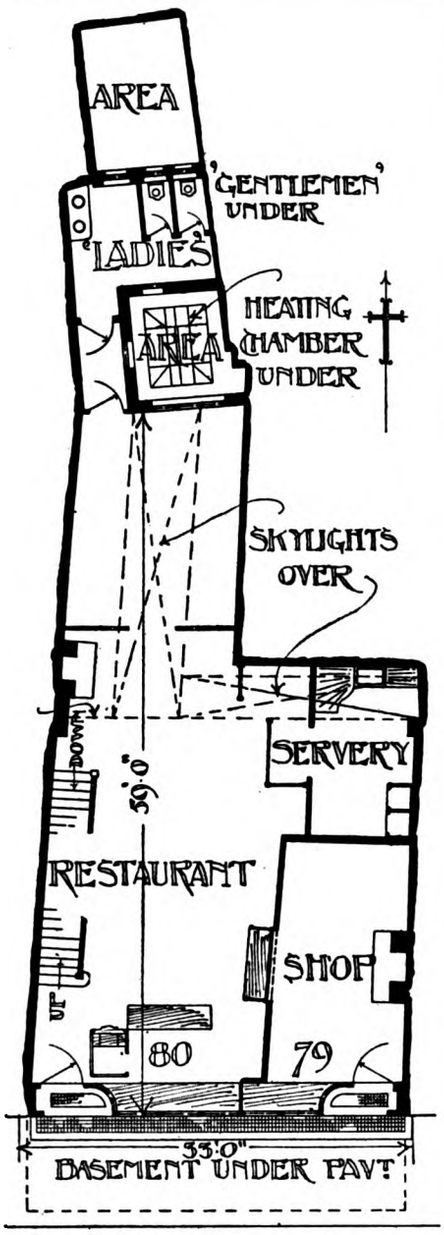
BUSINESS PREMISES, HIGH HOLBORN.

As originally designed, this building was to be in one occupation as a restaurant, the main feature of the ground plan being a central entrance opposite a good staircase in a central well leading to and lighting the basement. The upper floors were to be used as ladies' room, smoking-room, administrative offices and kitchen, etc., on top floor, all communicating with passenger and service lifts. The central stair from ground floor to basement and the passenger lift have been omitted, and the shop divided.

The shop front as executed is in teak with maple inlay, and is of a more architectural character than that illustrated.

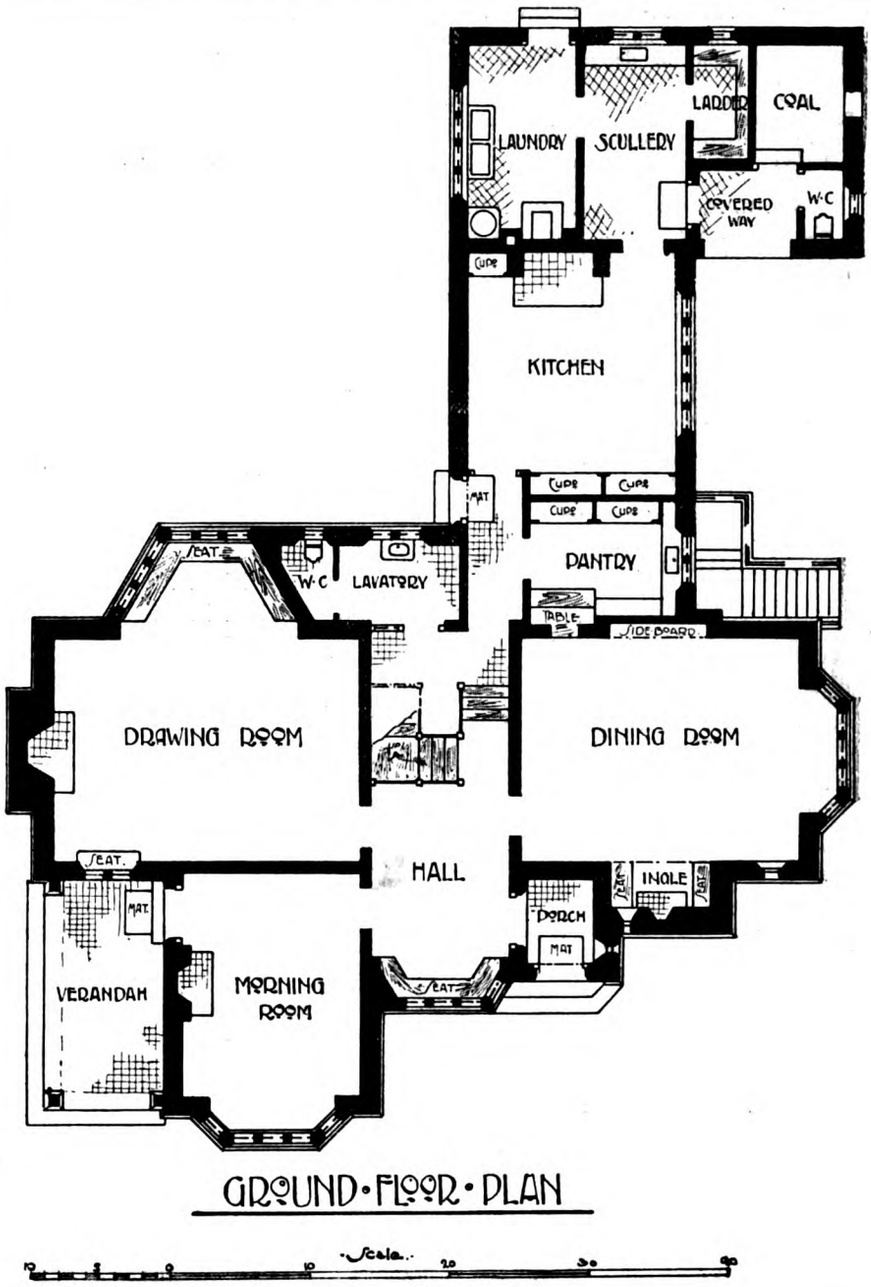


Business Premises, Holborn. Plan.

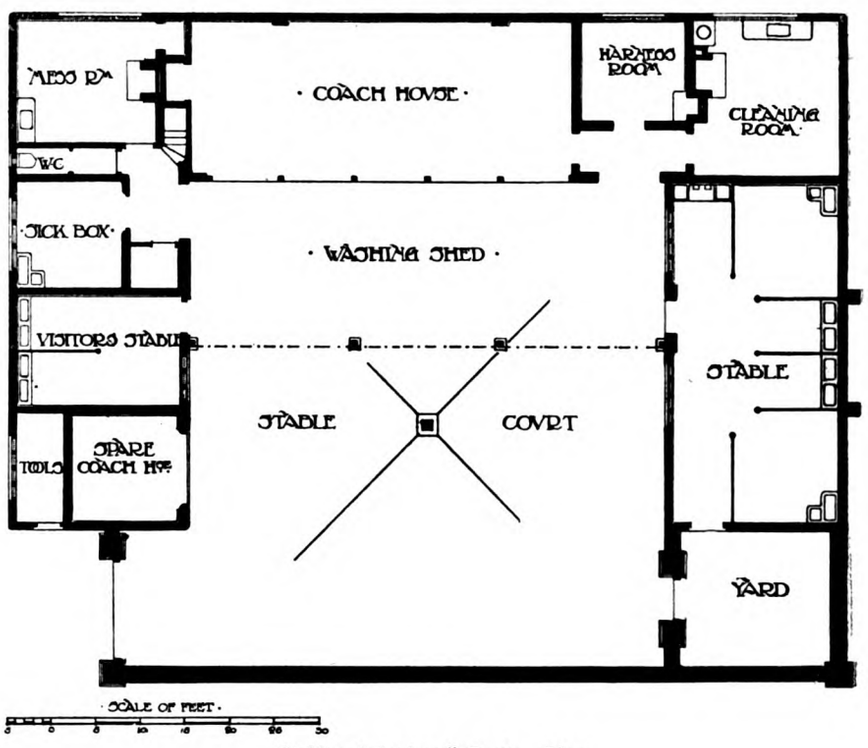
Each floor is carried without column or stancheon supports, and to get the maximum of light the main girders, which are deep and show below the ceilings, run from front to back walls, and in spite of low ceilings the lighting is successful. The basement and ground-floor walls are lined with tiling. Hot water for supply and heating is from a vertical boiler in the basement.

The front is of red brick and Portland stone, with bright green vitreous mosaic frieze and cheeks to the entrances.

Messrs. Patman and Fotheringham were the builders, and Mr. Waymouth, of Messrs. Lacy W. Ridge and W. Chas. Waymouth, architects, are responsible for the design.



"Dalguire," Harrogate.



Stables, "Brahan," Perth. Plan.

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"DALGUIRE," HARROGATE.

THIS is a house built a few years ago at Harrogate, from the designs of Mr. F. W. Bedford.

The ground-floor portion is built of Pateley Bridge stone and local sandstone, the upper walls being partly covered with red tiles.

A plan of the house is appended.

STABLES, "BRAHAN," PERTH.

WE gave in our issue of May 14 a view of the house built under the title of "Brahan," from the design of Messrs. Bedford and Kitson. The present illustration shows the exterior of the stables in connexion with it, in which an effort has been made to give some picturesque effect to what is really little more than an exterior enclosing wall. The effort was so far successful that the drawing was accepted at the Royal Academy at the time it was made.

The walls are covered with roughcast, and the roof with green slates. The plan shows the accommodation provided.

The Student's Column.

ARCHES.—XXII.

BRICK arches are sometimes built of specially-formed bricks, moulded or rubbed so as to suit the radius of the arch, and at others of ordinary bricks. In either case the bonding requires particular attention. When wedge-shaped bricks are employed ordinary methods of bonding may be adopted, but the joints between bricks with parallel surfaces frequently require the addition of packing, usually applied in the form of thin pieces of slate driven into the outer ends of the joints.

A very common method of construction is to build the arch in concentric rings, laying all the bricks as stretchers perpendicularly to the axis of the arch, and relying upon the adhesion of the mortar to connect the several rings. This form of construction is not to be recommended where great strength is required unless the bricks are laid in cement mortar. By Fig. 88 it will be seen that the radial joints are necessarily broken, owing to the different number of bricks in each of the concentric rings.

Another method is to lay some of the bricks as headers and some as stretchers, as in Fig. 89, thus practically forming a single ring with continuous or unbroken radial joints, which must be thickened at the outer end by mortar, preferably with the addition of slate packing.

Still another method is to adopt the *block in course bond*, which is formed by dividing the arch ring into a number of sections, each consisting of a block of brickwork, and making the joints continuous between the sections, as in Figs. 90 and 91. The bricks of the separate blocks may be laid with any bond, either with continuous or broken radial joints. Fig. 92 represents a variation of this type of construction, in which some of the blocks are divided by circumferential joints.

Strips of hoop-iron, laid circumferentially, laterally, and radially, in the joints of an arch add very considerably to their cohesion. The ends of the hoop-iron placed in the circumferential joints should be long enough to be turned down and inserted in the radial joints of the brickwork. Strips applied in a radial direction may also be bent over and built into the horizontal joints of the backing and spandrels.

Rankine says that by the aid of a hoop-iron bond Brunel built a half-arch of brick, laid in strong cement mortar, which stood projecting from its abutment like a cantilever to the distance of 60 ft., until it finally failed owing to the foundation being undermined.

In place of the thin gauge hoop-iron commonly used it is better to employ thicker strips of mild steel, for the additional strength afforded by the metal depends entirely upon the rigidity of the ends turned over into the joints, more or less perpendicular to those in which the greater length of the metal is embedded. Further, the rigidity of the ends is approximately as the square of the thickness. Hence the thickness of the strips might very well be made almost as great as that of the mortar joints. The strips ought to break joint with each other, and the ends should be bent down for at least 2 in.

TABLE IX.—ULTIMATE COMPRESSIVE STRENGTH OF BRICKWORK. (WATERTOWN ARSENAL TESTS.)

Mortar.				Strength of the Brickwork, lbs. per sq. in.	Strength of 6-in. Cubes of the Mortar, lbs. per sq. in.	Relative Strength of the Brickwork. Mortar = 1.
Lime.	Cement.		Sand.			
	Portland.	Natural.				
1·0	—	—	3·0	1,508	124	12·0
0·5	—	1	1·5	1,646	183	9·0
0·5	1	—	1·5	1,411	192	7·0
—	—	1	2·0	1,972	162	12·0
—	1	—	2·0	2,544	545	4·7
—	—	1	—	—	521	—
—	1	—	—	2,875	3,483	0·7

TABLE X.—ULTIMATE COMPRESSIVE STRENGTH OF BRICKS AND BRICKWORK.

Description of Bricks.	Average Strength of Bricks, lbs. per sq. in.	Strength of Brickwork in Mortar of Different Composition.			
		Lime 1 Sand 2	Lime 7 Cement 1 Sand 16	Cement 1 Sand 6	Cement 1 Sand 2
Clinker Stock	5,390	2,370	2,590	2,960	3,410
Selected Stock	3,669	1,620	1,760	2,020	2,320
Ordinary Stock	2,930	1,290	1,390	1,610	1,850
Perforated	2,759	1,210	1,320	1,520	1,710
Porous	2,617	1,150	1,250	1,440	1,650
Perforated Porous	1,195	530	570	650	750

One great objection to the use of concentric brick rings built as in Fig. 88 is that the rings act more or less independently, and it is, therefore, impossible to determine the precise proportion of the load carried by each ring.

Consequently, one ring may have to support a far greater load than that intended by the designer. In practice, however, this disadvantageous characteristic rarely causes danger, because the unit working pressures adopted are usually extremely small as compared with the ultimate strength of the brickwork. The mean working pressure on brick arches is rarely more than 40 lb. per sq. in., and it will be seen from Tables IX. and X. that this is low enough to permit very considerable divergency from theoretical conditions without involving the slightest risk.

These tables also serve to suggest that, so far as pressure is concerned, modern practice errs very largely on the side of safety. Table IX. is based on tests made at Watertown Arsenal upon brick piers 12 in. square, and from 1 ft. 4 in. to 10 ft. high, and Table X. gives the results obtained from German tests quoted in "The Proceedings of the Institution of Civil Engineers," Vol. lxxix.

For some reasons, however, the ring bond is to be preferred in practice. It affords a 4-in. toothing for cement, and the work can be executed rapidly with less risk of inferior workmanship than in the case of the other bonds mentioned.

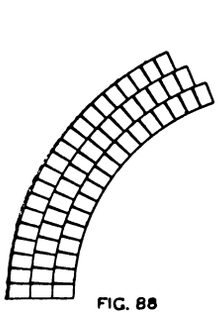

FIG. 88

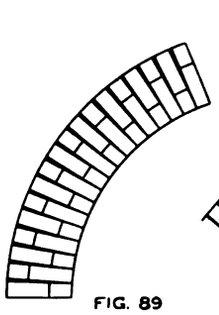

FIG. 89

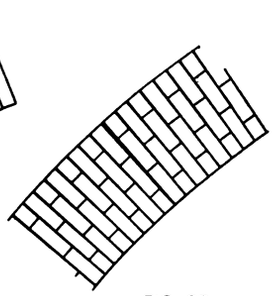

FIG. 90

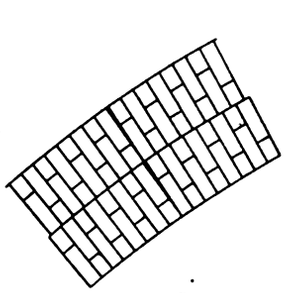

FIG. 91

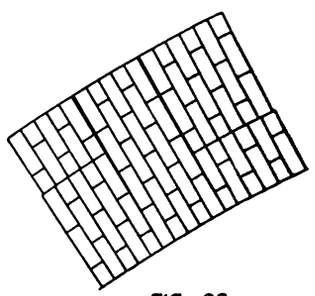

FIG. 92

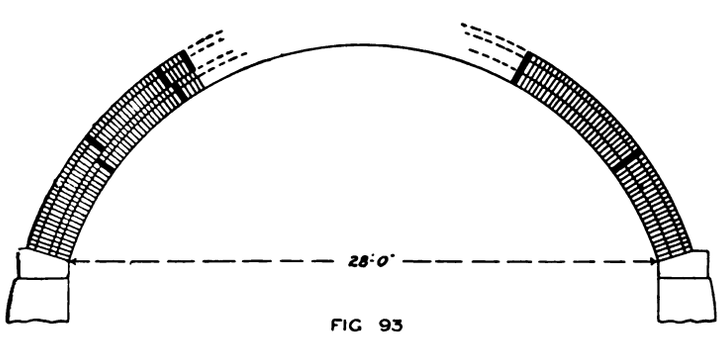

FIG 93

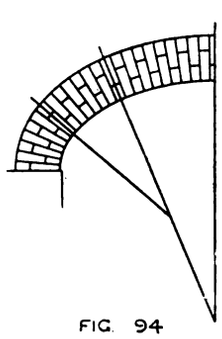

FIG. 94

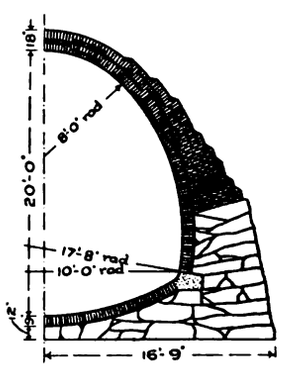

FIG. 95

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When the bond with continuous radial joints is adopted the thickened outer ends of the joints become compressed on the removal of the centring, thus concentrating pressure at the intrados. This effect is less marked when the bond is applied to comparatively narrow sections of an arch, as in the middle section of brickwork in Fig. 92. For arches in which heavy pressure is to be imposed on the brickwork the block in course bond is to be recommended.

Owing to the large number of joints in brick arches, the settlement taking place after the removal of the centring is always comparatively great. Consequently, stone is preferable for arches of large span or of small rise. Nevertheless, as will be seen by reference to Table VIII., Article XX., many brick arches of large span have been built, and Trautwine cites examples of 50-ft. brick arches in which the rise is only 7 ft.

The latter form part of a viaduct on the Philadelphia railroad, and have been subjected to heavy goods and passenger traffic since the year 1880. The arch rings are 2 ft. 6 in. thick, the joints being in lime mortar and about ¼ in. thick. One of the arches settled about 3 in. after the centring was struck, but no further settlement was observed.

The following specification for brick arch masonry is that adopted on the Atchison, Topeka, and Santa Fé Railway, U.S.A. :—

"The bricks must be of the best quality of smooth, hard-burnt paving bricks, well tempered and moulded, of the usual size, compact, well-shaped, free from lime, cracks, and other imperfections, and must stand a pressure of 4,000 lb. per sq. in. without crushing. No bats will be allowed in the work except for making necessary closures. All bricks will be culled on the ground after delivery and selected in strict accordance with these specifications.

"The mortar must be made of 1 measure of good natural hydraulic cement and 2 measures of clean, sharp sand—or such other proportion as may be prescribed by the engineer—well mixed together with clean water, in clean mortar-beds constructed of boards, and must be used immediately after being mixed.

"The brick must be laid flush in cement mortar, and must be thoroughly wet when laid. All joints and beds must be thoroughly filled with mortar so as to leave no empty spaces whatever in the masonry of the walls and arches, which must be solid throughout. The thickness of mortar-joints must be as follows:—In the walls and in the arch between bricks of the same ring not less than three-eighths of an inch (⅜″) nor more than one-half inch (½″). In the arch between rings not less than one-half inch (½″) nor more than five-eighths of an inch (⅝″). Each brick is to be driven into place by blows of a mallet. The bricks must be laid in the walls with the ordinary English bond, five stretcher courses to one header course. They must be laid in the arch in concentric rings, each longitudinal line of bricks breaking joints with the adjoining lines in the same ring and in the ring under it. No headers to be used in the arch."

Fig. 93 represents the left and the right halves of two brick arches each with a span of 28 ft. One of these is built in four rings, two of 9 in. and two of 4½ in.; and the other in three rings, two of 9 in. and one of 4½ in. It will be observed that the rings are bonded at various points by continuous or partly continuous radial courses.

Fig. 94 represents a so-called elliptical arch built with wedge-shaped or gauged bricks. A truly elliptical curve would be extremely inconvenient for an arch built with gauged bricks, for, as the bed joints must be normal to the intrados, all the bricks would be of different shape, and this would entail much unnecessary expense. By adopting a three-centred curve, as in the figure, only three templets are required for shaping the bricks, and the radial bed joints can be struck from the centres of the segments forming the curve of the intrados.

Fig. 95 is an example of brick masonry as applied to the construction of a large sewer.

Brick arches are very largely used in this country in highway and railway bridges, as well as in railway tunnels. Actual examples are, therefore, available for examination by the student in almost every district. The general principles governing the design of brick arches are the same as those applying to stone arches, and which have already been discussed in previous articles.

COMPETITIONS.

CHURCH, HALIFAX.—The plans of Messrs. Sutcliffe and Sutcliffe, architects, Hebden Bridge and Todmorden, for the new St. Hilda's Church to be erected at King Cross, Halifax, have been selected by Mr. H. Scott, the diocesan architect, to whom they were submitted along with five other sets. The estimated cost of the edifice is about 10,500*l*.

NEW SOMERBY CHURCH SCHEME.—The time for sending in plans is extended to July 31.

Books.

British Engineering Standards Coded Lists. Issued by authority of the Engineering Standards Committee. Vol. I. Rolled Sections for Constructional Iron and Steel and Tram Rails. Compiled by ROBERT ATKINSON. London: Robert Atkinson, Limited. 1904.

WE have already reviewed some of the matter contained in the present volume, which has appeared in separate form—namely, the history and work of the Engineering Standards Committee, and the lists of rolled sections for constructional iron and steel, and of tramway rails and fishplates. Much other material will be found in this book, which ought to be of great service to architects, engineers, and merchants in all parts of the world. It includes directories of rolling mills, constructional engineers, and iron merchants, together with the sizes of structural iron and steel rolled or stocked by them, and of railway carriage, wagon, and tramcar builders, and shipbuilders, these directories covering some 168 pages. After them comes the Engineering Standards Code, which, with its index, occupies over 200 pages, and appears to provide for telegraphic communication upon almost every contingency likely to arise in connexion with the ordering of materials. The work is a handsome quarto volume, well printed on paper which, like the binding, seems well adapted to stand the heavy and constant usage it is likely to receive.

Dynamo, Motor and Switchboard Circuits for Electrical Engineers. By W. R. BOWKER, C.E. London: Crosby Lockwood and Son. 1904.

THE author has compiled a volume consisting mainly of diagrams, most of which will prove instructive to youthful electrical engineers. The diagrams of electric car connexions and controllers are clearly drawn. Several different ways of representing these are shown, and this will be a real help to the beginner. A few of the diagrams should be redrawn; for example, Figures 69 and 108. In Fig. 108 there are two ammeters in series with a wattmeter, and if the double-pole switch L is closed they would all be burned out. The discriminating transformer is also put in apparently for ornamental purposes, as it is only connected with one bus bar. The descriptive letter press is not good. We are fairly familiar with electrical jargon, but we never heard of "phasing-up the phases" before coming across it in this book. The introduction, which is inaccurate, should be rewritten. Some of the definitions seem to consist of putting the words defined within inverted commas. Section 9 is entirely erroneous, and the definition of the power factor in section 11 is wrong. Users of this volume had better get their knowledge of the subject from books which adopt what the author calls the "Theoretical, Mathematical, and Text-book point of view."

Recent Improvements in Methods for the Bacterial Treatment of Sewage. With a description of the Author's Multiple Surface Bacteria Beds (Patent No. 16,851, 1903), giving double the usual working capacity, with Aërobic Action throughout. By W. J. DIBDIN, F.I.C., F.C.S., etc., formerly Chief Chemist to the Metropolitan Board of Works and the London County Council. London: Sanitary Publishing Co., 5, Fetter-lane, Fleet-street, E.C.

WE are not quite sure from the title-page (which we have printed *in extenso*) whether this pamphlet ought to be noticed under "Trade Catalogues" or under "Books," but have decided to give it the benefit of the doubt. It is a small pamphlet of thirty-two pages, of which eleven are occupied by a synopsis of the reports of the Royal Commission on Sewage Disposal. The author states in the Prefatory Note that it "may be looked upon, in some respects, as a supplement" to the third edition of his *Purification of Sewage and Water*, which was reviewed in these columns a few months ago. Mr. Dibdin, quite naturally, is prepossessed in favour of the contact-bed system, which he was the first to adopt on a large scale, and for the improvement of which he has done so much, and some of his arguments appear to us to bear evidence of this prepossession. Surely it is somewhat far-fetched to compare the Thames, prior to the construction of the main intercepting sewers, to "a large septic tank," and thus to convey the impression (consciously or not) that the septic-tank system is as offensive as the practice of turning large volumes of crude sewage into a tidal river at low water. The argument based on the improvement in the condition of the Thames in the neighbourhood of London Bridge, by conveying the sewage to Barking and Crossness, and discharging it into the river twelve or fourteen miles lower down "during the first portion of the falling tide," is also beside the mark. Neither aërobic nor anaërobic action had much to do with the improvement. The most interesting part of the pamphlet is that in which the author describes and illustrates the tiles and slates which he now advocates for use in the coarse primary contact-bed. They give a larger liquid capacity than coke, do not disintegrate, and can be more easily cleaned. Whether they will effect as great a degree of purification remains to be seen, but they are certainly worth a trial.

Résumé, Historical and Practical, with Notes and Comments on the Subject of Sewage Disposal. By W. H. KNIGHT, M.S.I. London: The Sanitary Publishing Co. (No date.)

THIS little pamphlet of thirty-eight pages appears to be a reprint of articles contributed to a technical paper, but we do not think that the republication will be of much service. The subject is too great to be discussed with advantage in a small pamphlet, and the author is not always a sure guide. It is not true that broad irrigation is "invariably" a failure, nor is sub-irrigation the only other method of treatment on land. It is a libel on the engineering profession to say that there is "a widespread idea entertained by engineers and others (who ought to know better) that the *whole* process of purification is carried out by the septic tank." The author in writing about the filtration of chemically-precipitated sewage (through artificial filters of coal, coke, etc.) seems to have no knowledge of the Local Government Board's insistence on subsequent treatment on land, and hazards the dangerous statement that the effluents from these filters were in many cases "as pure as some drinking waters"; from the chemist's point of view the organic matter in the effluents may perhaps have been small in quantity, but the bacteriologist would certainly not consider them to be as innocuous as the author's words would lead the ignorant reader to imagine. The author confesses that he has "no data" as to the purification effected by the one type of percolating filter which he mentions, and does not appear to have seen the reports and appendices which have already been published by the Royal Commission on Sewage Disposal.

Drainage, Sewerage, and Conservancy in Tropical Countries and Elsewhere. By MAJOR F. SMITH, D.S.O., R.A.M.C., D.P.H. London: John Bale Sons and Danielsson. 1904.

MAJOR SMITH'S work gained the prize offered by the Hon. E. R. Belilios, C.M.G., for the best article on "The System of Drainage and Sewerage (Domestic and Municipal) Best Suited for Tropical Climates." It appeared in the *Journal of Tropical Medicine* at the end of last year, and is now published as a little book of ninety-two pages. The author writes with an intimate knowledge of the conditions obtaining in tropical countries, and reviews briefly the different methods of drainage, sewerage, and conservancy which are now in use. We certainly think that he underestimates the dangers of cesspools and the advantages of bacterial systems of sewage purification, but there is much to be said in favour of his contention for simplicity and economy. The elaborate and costly methods adopted in this country are, according to the author, inappropriate in countries where poor and ignorant "natives" form the bulk of the population. The book cannot fail to be of use to those engaged in the sanitation of towns situate in tropical countries.

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A Handbook of Sewer and Drain Cases, noted in "The Surveyor and Municipal and County Engineer." Revised and corrected by J. B. R. CONDER, solicitor. London: The St. Bride's Press. 1904.

THIS book will be useful as a collection of memoranda of the legal decisions on the above subject. But the layman will have to use it with caution, for County Court decisions are included, and these are of no value as precedents. Likewise cases of first instance are reported; and those of the Court of Appeal are stated, as indeed are all the cases, so shortly, that the basis of the decision may sometimes be misapprehended. Subject to this caution the book will be serviceable.

A Practical Guide for Sanitary Inspectors. By FRANK CHARLES STOCKMAN, A.San.I., with an introduction by Henry Kenwood, M.B., D.P.H. Second edition. London: Butterworth and Co., and Shaw and Sons. 1904.

THIS is the second edition of a work which we noticed favourably about two years ago. The author states in the preface that the matter has been "carefully revised, brought up to date, and considerably extended." A chapter on "Building Construction" has been introduced, and additions have been made to the chapters on "Cubic Space," "Infectious Disease," etc. The book is undoubtedly a valuable work of reference for the sanitary inspector; it is well arranged, and contains all the legal enactments which he is likely to require in the execution of his duties, and much useful information on nuisances, drainage, inspection of buildings, food, etc. Some of the new matter, however, is not above criticism. The chapter on "Building Construction" shows that the author has not an intimate knowledge of the subject. It is said, for example, that Portland cement "is made from materials containing *when burnt* some 33 per cent. of clay combined with lime *and shale*," and that "footings are formed of brickwork, *generally three courses.*" The italics are ours. On page 72 a table of the L.C.C. weights of lead (misprinted "land") and iron soil-pipes is given, and is said to apply only to soil-pipes "situated within any building" and not to those fixed outside. This statement is erroneous in more respects than one. In the chapter on "Cubic Space," 0·78 on page 103 should be 0·75; on page 105 the author in calculating the area of a trapezoidal bay ignores the simple rule given on page 103; and the calculation of the area of the trapezium on page 106 by means of the lengths of the four sides only is a blunder of surprising magnitude, and seems to indicate that the author does not understand the simple rule given by him on page 102 for calculating the area of a triangle. It is a pity that such errors have crept into the second edition of a work which is otherwise of considerable value.

The Pocket-book of Refrigeration and Ice-making. Edited by A. J. WALLIS-TAYLER, A.M.Inst.C.E. Third edition enlarged. Illustrated by thirty-one diagrams. London: Crosby Lockwood and Son. 1904.

THIS little book might justly be described as a treatise on the subject to which it is devoted, for, in addition to formulæ, data, tables, and memoranda, it contains a very intelligent explanation of the principles involved in refrigerating and ice-making apparatus and machines. The architect who is called upon to provide cold storage chambers and ice-houses will find much information for his guidance, especially in the chapter dealing with "Insulation." There is also a very complete index, which enables the reader to turn at once to the place where particulars are given relative to any part of the subject discussed.

A Pocket-book of Tables and Memoranda for Plumbers, Builders, etc. By J. WRIGHT CLARKE. Fourth edition. London: B. T. Batsford; 1904. 1s. 6d.

THIS is a new edition of an old and useful work, which has the merit of being really a "pocket-book" in size, so that it can be easily carried about. It contains many useful tables, practical directions for different kinds of work, and the section of electrical work especially is very fully treated.

A Précis of the English Law Affecting Landlord and Tenant. By LAURENCE DUCKWORTH, Barrister. London: Effingham Wilson. 1904.

THIS is a useful little manual on a subject interesting to very many persons. It is one of the well-known series of Wilson's Legal Handbooks. It appears to be an accurate and concise summary of the law.

BOOKS RECEIVED.

THE MODERN CARPENTER, JOINER, AND CABINET-MAKER. Edited by G. Lister Sutcliffe. Divisional-Volume VIII. (The Gresham Publishing Co.)

GAS WORKS: THEIR CONSTRUCTION AND ARRANGEMENT. By Samuel Hughes, C.E. Ninth edition, revised by Henry O'Connor, Assoc.M.Inst.C.E. (Crosby Lockwood and Son. 6s.)

GREAT MASTERS: REPRODUCTIONS IN PHOTOGRAVURE. Part XVI. (W. Heinemann. 5s.)

TRADE CATALOGUES.

THE Fireproof Company have sent us two catalogues in which their "dovetail corrugated sheeting" is described and illustrated, and also a number of drawings to a larger scale than those in the catalogue. As the name implies, the sheeting is of iron formed into a series of corrugations of dovetail section, which afford an excellent key for plaster. It is used for partitions, the finished thickness when plastered on both sides being from 2 in. to 3 in. according to the height, and is also adopted for the permanent centring of fireproof floors, for ceilings, for encasing columns and girders, and for external walls. The cross section of the sheeting ensures considerable strength, as well as a good key for the plaster, and the recent fire at 198, Oxford-street, W., proves that partitions of this kind offer great resistance to the spread of the flames; in this case the floors were of wood, and the only damage done to the Fireproof Company's partitions appears to have been the flaking of the setting coat in the parts principally affected by the fire and water.

We have received from Messrs. Johnson and Phillips, of Old Charlton, Kent, an illustrated pamphlet on "Electric Power," describing the results obtained at several of the power plants they have installed. They seem to have been particularly successful in applying electricity for mining purposes, and as some of the power stations they have erected have been working for about ten years there can be no question as to whether this application of electricity has been a success financially. Many of the points discussed will be of great interest to all concerned in mining undertakings.

Messrs. W. James and Co. send us an illustrated pamphlet of their designs for stained and leaded glass, and sections of their casements in wrought iron, gunmetal etc. The stained glass designs are only given in monochrome, and therefore we can form little judgment of them; some of the designs executed in leaded white glass, the leads forming the design, are very good. The pamphlet also describes their method of strengthening leaded glass, while doing away with the detached stay bar. This consists of a steel rod applied at intervals to the lead cames in such a way as to render it an integral part of the came. The detached bar is thus superseded; the copper wire "tie" (which is always apt to tear the clothes and scratch the hands) is entirely dispensed with; and greatly increased strength and rigidity are attained. It can be adapted to follow the lines of an ornamental design.

The B. and S. Folding Gate Company send us a small book containing illustrations of their ornamental treatment of elevator car enclosures, bank railings, etc. Most o these look well as to general appearance, and the Company are to be commended for endeavou ng to give decorative effect to such work; but the illustrations are on too small a scale for us to form any opinion as to the detail.

Messrs. English Brothers (Wisbech and Peterborough) send an illustrated pamphlet of their creosoted farm shedding, wood fencing, field gates etc. They make a point of the importance of covered yards in farms: "any improvement in shelter for stock is equivalent to an actual shortening of winter"; and also draw attention to the important addition to the life of wooden structures and fencing by creosoting. We quote the following, which we have no doubt is correct:—

"There exists a very good example in the sheet piling of the river Nene opposite our office, where the creosoted wood piling, driven in 1854-6, is still standing firm after fifty years in work, while similar piling executed in 1890, only fourteen years ago, with the same class of timber, without creosoting, has seriously decayed and has now to be replaced."

The designs for the work are plain and practical in character; for the railings and gates they are just what is wanted; in the case of the farm shed illustrated some attempt might be made to give a little more character to it; an architect could show them how to do this.

Messrs. Reid and Co. send us a book of designs prepared in their house for the decorative treatment of fire-places, sides of rooms of different classes, etc. Some of these are very good, the "Small Morning Room" and "Small Dining Room," for instance, and some of the fire-place arrangements. Of course the designing of the whole treatment of the side of a room is rather trenching on what we think ought to be the province of the architect, but if people will not go to architects to design these things, it is well that there should be trading firms who are able to carry them out in good taste.

Mr. John P. Whyte (Bedford) sends us a book of illustrations of various garden furniture—summer houses, pavilions, pigeon cotes, garden treillage, etc. As would be expected by those who know Mr. Whyte's work, these things are mostly in excellent taste; in some cases, for simple work—the dovecotes, the "Caxton" garden pavilion, the palm boxes, Nos. 1, 2, 8, and 9, etc., they could hardly be better. We do not like rustic garden houses like the "Silsoe" and "Shelton" designs, but some people will have them; and we should prefer the "rustic bridge" in squared wood, and not in the rough, bark-covered pieces; but at all events the design is treated symmetrically, and not made to look as if it were wriggled by accident. But "rustic" things generally are a mistaken taste. As a whole, however, this is a catalogue we can recommend.

Messrs. Edison and Swan send us a book of illustrations of their "Artistic Electric Light Fittings." These are elaborate and varied, but from the artistic point of view they are not very satisfactory; there is too much "wriggle" about the designs; a want of simplicity of line. The effort to produce what are called "artistic" designs too often leads to this kind of over-elaboration, which is not really artistic in spirit, unless it is accompanied by the most refined taste in details, which is hardly the case here.

The Cloisonné Glass Company send a catalogue of numerous designs made in their house for execution in their glass. There is a good deal of praiseworthy work in the designs, but too much is attempted in many of them; the pattern ones are the best, those numbered 76 to 99 (with some exceptions), and that numbered 13 for a staircase window, which is very good, and seems to be the product of a special designer. Figure subjects like Nos. 8, 9, and 10 are the kind of thing that should be done very well if done at all. The coloured plate for a conventionally treated landscape (5) is good, and reduces landscape pretty fairly to the capabilities of stained glass. The Cloisonné glass is produced as a thin layer between two sheets of glass, and cemented to the back plate by a translucent cement to keep it in position. We cannot understand how it (or any stained glass) can show "equally well with the light either transmitted or reflected"; which seems an impossibility in the nature of things. There are some practical advantages in the method, however, enabling it to be used where ordinary stained glass could not so well be employed. We notice that throughout the catalogue it is printed "Cloisonne" without the accent, which looks awkward; it is right on the outside cover.

Correspondence.

COUNTRY BUILDERS' CLERKS.

SIR,—Can any of your readers inform me if any benevolent institution exists for country builders' clerks? Such an institution is in existence in London, but, so far as I can ascertain, this is for Londoners only. INQUIRER.

BRITISH FIRE PREVENTION COMMITTEE.—The Tsar of Russia has conferred upon Mr. Edwin O. Sachs the Gold Medal for Services with the ribbon of the Order of St. Vladimir, and upon Mr. Ellis Marsland the Gold Medal for Services with the ribbon of the Order of St. Stanislas. The Home Secretary has intimated that the King has been graciously pleased to accord Mr. Sachs and Mr. Marsland permission to wear these medals.

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OBITUARY.

MR. CHAPMAN.—We have to announce the death, in his fiftieth year, at his residence, King's Field House, King-street, Newcastle-under-Lyme, of Mr. Robert J. Chapman, senior partner of the firm of Messrs. Chapman and Snape, architects, surveyors, and valuers, of No. 3, Lad-lane, Newcastle-under-Lyme. In 1885 the firm submitted designs in the competition for the new Public Municipal Buildings in Newcastle-under-Lyme, for which the first premium was awarded to the designs of Messrs. Wm. Sugden and Son, Mr. John Blood, and Mr. W. H. Sugden, as joint architects. But inasmuch as Messrs. Chapman and Snape's designs contained some features which highly commended themselves to the Town Council, the successful competitors were asked to agree to an arrangement whereunder they and Messrs. Chapman and Snape undertook, conjointly, to prepare further designs which the Town Council adopted after consultation with Mr. Thomas Lewis, architect, a member of their own body. The modified plans and designs are illustrated, with two elevations and four plans, in the *Builder* of April 24, 1886. Four years ago Messrs. Chapman and Snape were appointed architects of the laundry, with other additions and improvements, of the Hospital for the Poor Law Guardians of Cheadle.

MR. ALEXANDER.—We have to announce the death, on May 15, in his sixty-fourth year, of Mr. William Alexander, of No. 32, Bank-street, and No. 4, Albany-terrace, Dundee. Mr. Alexander had been City Architect and Valuator during many years past. Amongst the more important of the buildings for which he prepared the plans and designs we may instance the following:—In Dundee, Her Majesty's Theatre, in Seagate, having a front after the manner of a Florentine palace, and a capacity of about 1,600 persons, 1885; the completion of the eastern portion, comprising the free museum and picture gallery, of the Prince Albert Institute, begun in 1865-8 by Sir George Gilbert Scott (see the article "Dundee" in the *Builder* of August 13, 1898; the business premises in Murraygate for Messrs. Smith Brothers, of which the upper four floors were planned for occupation by the Conservative Club, an insurance office, and private residents, 1897; the new offices in West Bell-street for the Combination Parish Council; the Children's Shelter, with alterations and additions, at Laurel Bank, Constitution-road, at an estimated cost of some 10,000*l.*, opened in October, 1899; the Alexander Moncur Sanatorium for consumptive patients, on the Airlie Estate, at Greenford Muir, near Auchterhouse-hill, at an outlay of about 15,000*l.*; the Andrew Carnegie Free Library, at the corner of Arthurstone-terrace and Maitland-street, for which, being the first, the Dundee District Libraries Committee approved the plans in October two years ago; the Gaiety Theatre of Varieties, in Victoria-road, in 1902, which accommodates an audience of about 1,500 persons; and the Victoria Art Galleries, near the Prince Albert Institute, opened on October 26, 1839. Mr. Alexander was the architect also of the New Theatre and Opera House in the High-street, Perth, which provides room for an audience of about 1,300 persons, and was opened in the autumn of 1900.

GENERAL BUILDING NEWS.

NEW CHURCH, KINSLEY, YORKSHIRE.—The foundation-stone of a new church at Kinsley was recently laid. The church, which is to accommodate 250 persons, will be built of red brick, and was designed by Mr. Francis Inigo Thomas. The total cost of the building will be 2,395*l.*

RESTORATION OF ASTLEY CHURCH, WORCESTERSHIRE.—The Parish Church of Astley is situated amidst enchanting scenery, and the old massive tower, which still stands as erected in the early part of the XVth century, is a conspicuous object in the landscape. From an archæological point of view the church is one of the most interesting in Worcestershire. Its history goes back to the days of the Norman Conquest, and there are features still preserved which reveal the skill of the old builders. The Norman doorway on the south side of the church is most interesting, and it has now been protected by the erection of an oak porch. Some portions of the church had got into a state of decay, and some of the pleasing characteristics of the original building were obscured. The old sandstone walls were covered with about 2 in. of plaster, and various coats of coloured wash and paint. The nave roof, dating from about 1470, was hidden behind a circular plaster deal ceiling, while the high, painted deal pews made kneeling almost an impossibility. About two years ago the Rector, the Rev. Martin B. Buckle, undertook the work of restoration, and 2,400*l.* was raised, which has been expended on the the body of the church, leaving the restoration of the tower, the insertion of new windows and buttresses to the north aisle, the provision of oak seats in the nave and north aisle, and chancel benches, and the restoration of the old churchyard entrance, at an estimated cost of 1,200*l.*, to be carried out at some future date. The Rector, who, before his ordination, was a member of the Institute of Architects, prepared the plans, and personally superintended the work, the contractor being Mr. Henry Smith, of Kidderminster and Wolverley. The nave roof has been restored and new roofs erected on the other portions of the church. The east wall of the chancel was modern. This has been removed, the chancel lengthened about 6 ft., being thus restored to its original length. The chantry chapel, which was used as a vestry and lumber-room, has been restored as a side chapel, and will now be used daily for prayer and weekday celebrations. The north aisle, erected in the time of the late Mr. Havergal in the place of the original Norman aisle, has been reroofed, and, with the exception of the windows, brought into harmony with the XVth century work of the church. The tower has been screened off to form a choir vestry, the screen being formed out of some old oak panelling found in the church. A new oak screen, to form a sacristry and entrance to the chancel, has been been erected at the east end of the north aisle. All the old walls have been restored, no rebuilding having been done except where entire disintegration had taken place, and, in all instances, the ancient characteristics of the work have been faithfully copied. The church has been enriched by several memorial gifts. Mrs. Wm. Jones has erected a stained-glass window, in the east end of the church, in memory of her husband, the patron of the living. It represents the Crucifixion of the Redeemer, in the two outer lights being inserted figures of the Virgin and St. John. The canopy work is copied from a window still existing in Evreux Cathedral, erected in 1402. Mr. J. H. Crane, of Okehampton, and members of his family have given a new altar and reredos, carved in oak, the back panels being filled with tapestry.—*Worcester Herald.*

RESTORATION OF THE PARISH CHURCH, EAGLE.—The reopening of the nave, chancel, and aisle of the Parish Church, Eagle, took place recently. The nave erected is an exact replica of the old Norman architecture. The tower, which is Early English, is left intact. The treatment of the whole edifice, with the exception of the arcade, is Free Perpendicular, and the roofs are of English oak, while the floor is made of Hopton wood. The east window is by Messrs. Heaton, Butler, and Bayne. In the course of the restoration some Saxon work was brought to light, including the remains of a Saxon cross and Norman bases, which have been reproduced in the new fabric. The restoration was carried out, under the superintendence of Mr. J. T. Lee, architect, London, by Messrs. Bowman and Son, Stamford, at a cost of 1,685*l.*

RESTORATION OF BREADSALL CHURCH, DERBYSHIRE.—The first portion of the restoration work, in connexion with All Saints' Church, Breadsall, has been completed. The roof of the edifice has been retimbered with English oak, and the foundations have been underpinned with blue brick and concrete. The architects were Messrs. Naylor and Sale, Derby, the contractor being Mr. A. Smith, Derby. The cost of the improvements has been 2,000*l.*

CATHOLIC CHURCH, STIRLING.—The foundation stone of the new church which is in course of erection for the Roman Catholic denomination in Stirling was laid on the 4th inst. The church is built from designs of Messrs. Pugin and Pugin. It is 134 ft. long, and from floor to ceiling will measure 55 ft. The outer walls are faced with Dumfriesshire red sandstone, while the pillars and inside dressings are of white Prudham sandstone. The baptistry projects towards the right front, the corresponding projection on the left having the stair which leads to the choir and organ gallery, which are placed over the front of the building. The sacristies are placed at the chancel end, and there are confessionals on each side of the church, with a porch on the south side.

BAPTIST CHURCH AND SCHOOLS, WAVERTREE, LIVERPOOL.—The foundation-stone of these buildings was laid on the 26th ult. The buildings are designed in Perpendicular Gothic, freely treated; the facings are in whole white flints with red dressings. The block comprises church, having four vestries, large school-room with six class-rooms opening into it by means of swivel partitions, boys' and girls' cloak-rooms, heating chamber and coal store, and the usual conveniences. The plan of both church and school is based upon the Greek Cross. The church provides accommodation for a mixed congregation of about 1,175 persons. Provision is made for future extension by means of side galleries, which can be put in without structural alteration at any time. The whole of the seating is circular on plan, so that the entire congregation directly faces the preacher. The contract was for 8,693*l.* The architects, whose design was selected in a competition, are Messrs. George Baines, and R. Palmer Baines, of London.

NEW FREE METHODIST CHURCH, SOUTH SHIELDS.—The foundation-stones of the new Free Methodist church and schools at South Shields were laid recently. The buildings will stand on a site at the corner of Birchington-avenue and Oxford-street, and the estimated cost of the work is 4,500*l.* Mr. G. R. Smith is the architect, and the contractor is Mr. W. J. Robertson.

WEST U.F. CHURCH, ALLOA, N.B.—The improvements in connexion with this church have now been completed. Messrs. Sydney Mitchell and Wilson, Edinburgh, were the architects for the work, and the cost has been between 7,000*l.* and 8,000*l.*

WESLEYAN MISSION HALL, TUNBRIDGE WELLS.—The foundation-stones were recently laid of a new Wesleyan Mission Hall in Hill-street, Tunbridge Wells. The building, which has been designed by Mr. C. H. Strange, consists of two portions, the main meeting-room in the rear, and vestries and classrooms in the front. The former will be about 42 ft. long by 26 ft. wide, and capable of seating about 200 people. The front building will contain a classroom on the upper floor, 26 ft. long by 13 ft. wide, large enough to accommodate a class or meeting of fifty persons. This room will have openings into the main meeting-room, making it available as a gallery. Beneath, on the ground floor, will be two rooms, fitted as a vestry on the one side, and a kitchen on the other, but these will be enclosed only by partitions or curtains so that, if necessary, the whole of the ground-floor space can be thrown into the meeting-room. With the addition of the gallery and ground-floor rooms, the total accommodation for a public service or meeting will be from 250 to 260 persons. The heating will be by hot-water radiators, and the lighting by electric light. The amount of the building contract is 1,172*l.*, and the contractors are Messrs. J. Jarvis and Son.

NEW WESLEYAN SUNDAY SCHOOL, HALIFAX.—The memorial-stones of a new Wesleyan Sunday school, at Halifax, were laid recently. The plans for the work have been prepared by Mr. A. G. Dalzell, architect, and the estimated cost, including site, is 6,000*l.*

NEW SUNDAY SCHOOLS, SUTTON-IN-ASHFIELD.—The new Sunday schools, which have been erected in connexion with the Wesleyan chapel, Sutton-in-Ashfield, were opened recently. The new school has a hall, which will seat 650 people; there will be, when complete, sixteen class-rooms, and, by utilising these, 800 people can be accommodated. The internal woodwork is of pitch-pine; the building is lighted by incandescent lights. The cost is 3,056*l.*, inclusive of the site, which cost 750*l.* The schools are situated in Welbeck-street, adjoining the old school. Mr. H. Harper, architect, of Nottingham, designed the building.

CHANCEL AT ORPHANAGE, BRIXHAM.—The foundation-stone has just been laid of the chancel and sanctuary of the British Seamen's Orphan Home, Brixham. The new building is to be carried out in accordance with the plans of Mr. E. Appleton, architect, of Torquay, a member of the committee, and it will be 20 ft. by 12 ft., with a small side vestry. There will be a chancel arch with screen between the school and the chancel.

SCHOOLS, NORTH SHIELDS.—The Queen Victoria Schools, North Shields, are situated in Coach-lane. Accommodation is provided for 1,350 pupils on two floors, each floor having ten class-rooms and assembly halls. The one on the first floor is 92 ft. long by 28 ft. wide. There are two cookery rooms on the third floor, accommodating fifty students each. Each class-room is fitted with dual desks, and left-hand light is obtained in every case. The first part of the school was built by Alderman Jos. Elliot, contractor, of North Shields. The new portion has been erected by Mr. Thomas Patterson, contractor, of North Shields and Whitley Bay. Mr. J. T. Heslop had the plumbing contract, and Messrs. Harding and Co., Whitley Bay, the decoration. The heating contract has been in the hands of Messrs. Emley and Sons. The electric lighting and fans were installed by Messrs. Dagman and Ryder, of North Shields. The North of England School Furnishing Co. are responsible for the furniture and fittings. The plans have been carried out by Messrs. Marshall and Tweedy, architects, Newcastle, under whose superintendence the buildings have been

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erected. The plans were selected in competition some five or six years ago, when the firm was Messrs. Marshall and Dick, who designed the whole scheme.—*Newcastle Chronicle.*

WORKMEN'S DWELLINGS, SHEFFIELD.—New workmen's dwellings are to be erected on the Croft area in Sheffield. The new buildings will accommodate 322 people, and the cost is estimated at about 24,962*l.* The plans for the work have been prepared by the staff of Mr. C. F. Wike, the City Surveyor.

NEW LIBRARY, KETTERING.—The new free library at Kettering, situated in Sheep-street, was opened on the 7th ult. The structure is built of red brick, with Ketton stone windows and dressings. The contract was awarded to the Kettering Co-operative Builders, whose tender was for 7,145*l.* The architects were Messrs. Goddard and Co., of Leicester. The library is a one-floor building, with 130 ft. frontage and a depth of 85 ft.

MUNICIPAL ART GALLERY AND MUSEUM, BRISTOL.—A new block of buildings has been erected in Queen's-road, Bristol, to serve for the double purpose of a municipal art gallery and an extension to the museum. The work has been carried out by Messrs. W. Cowlin and Son, Bristol, from plans prepared by Mr. Frank Wills, architect.

ASYLUM AT BANGOUR, EDINBURGH.—A meeting of the Edinburgh Lunacy Board was held on the 23rd ult., at which a report by Dr. Keay on the accommodation to be provided in the eight additional homes for patients at Bangour was submitted. Dr. Keay stated that the five wood and iron villas already built would eventually accommodate 225 male patients of the quiet and easily managed class, with the staff required to look after them. It was expected that they would be chiefly employed on the farm and in the garden and grounds of the institution. The architect had in preparation plans for four homes, providing accommodation of a similar kind for quiet, easily managed, female patients. In these industrial homes they should have accommodation for 415 patients—225 males and 190 females—of the quietest, most trustworthy, and most easily managed class. It could not be expected, however, that all, or nearly all, the patients who would be sent would be quiet and easily managed. He would, therefore, recommend that the remaining four houses, making up the eight which it had been resolved to build, should be designed to accommodate these troublesome patients. Two of the houses would be for male patients and two for females, and they would accommodate seventy-two of each sex. If the arrangement was carried out as proposed there would be accommodation for 337 males and 302 females, a total of 639 patients. The report was approved, and plans prepared by Mr. Blanc of the four homes were remitted to the Building Committee.—*Glasgow Herald.*

MESSRS. BROADWOOD'S NEW PREMISES.—In connexion with Messrs. Broadwood's new show-rooms in what was formerly Limmer's Hotel, which were mentioned in a Note in one of our recent issues, we may here add that the extensive structural alterations and the decoration of the premises were carried out from the plans and under the supervision of Mr. H. Tanner, jun., by Messrs. Patman and Fotheringham. The hot water fittings were carried out by Messrs. Mitchell and Co.; the lifts by Messrs. Richmond and Co., and the electric wiring by Messrs. Rashleigh Phipps and Co. Mr. Thomas was the clerk of works.

WORKMEN'S DWELLINGS, HELENSBURGH, N.B.—New workmen's dwellings have been erected in Maitland-street, Helensburgh. The new buildings consist of an east block and a west block, each of four stories, and attics, and each contains about twenty separate dwellings. There are ten one-apartment, twenty-three two-apartment, and ten three-apartment houses in all, and those above the ground-level are entered from balconies, which are reached by steel and concrete bridges from the staircase block, which block contains two staircases. In addition there are wash-houses, water-closets, a creche, and caretaker's house on the ground floor, and there is also a hall (capable of seating 100 persons) and committee-room in the back block. Messrs. John Burnet and Son, architects, Glasgow, prepared the plans for the work.

NEW CLUBHOUSE, CRAIL, N.B.—A new clubhouse is now in course of erection at Balcomie Links, Crail. The work is being carried out from the designs of Messrs. John and T. W. Currie, architects, of Elie, at a cost of 700*l.*

NEW POST OFFICE AND LIFEBOAT HOUSE, LLANDUDNO.—On the 20th ult. the new post office at Llandudno was opened. The premises are situated in the main thoroughfare from the railway station to Mostyn-street and the Parade, and stand on a site 150 ft. long by 45 ft. wide. The elevation to Vaughan-street is treated in a free Renaissance style in golden buff terra-cotta, from Mr. J. C. Edwards' works at Ruabon, with teak doors and windows. The main entrance, through a teak-wood vestibule, leads into a large public office, fitted up with horseshoe counter, writing spaces, telephone box, etc. This part has a Minton-Hollins glazed tile dado all round, with tile floor to the public space, and wood floor behind the counter. Behind the public office is a sorting office, and between the public office and sorting office is a special enclosure where registered letters are dealt with, and on a raised level, commanding the whole of the ground floor, through glazed screens, is the chief clerk's office. At one corner of the sorting office is a room for messenger boys, and, in the rear thereof, bicycle-house, truck-shed, etc. In the basement is the boiler-house, by which the premises are heated on the low-pressure hot-water system. Approached by two separate staircases from the rear of the sorting office are two common rooms for men clerks and postmen. There is a private entrance for staff, and a staircase connecting the different floors. On the same day the new lifeboat house in Lloyd-street, Llandudno, was opened. The building has been erected of limestone, and has a timbered slated roof. Both buildings are from the plans of Mr. G. A. Humphreys, architect, Llandudno.

NEW LIBRARY, BARNET.—The new library at Barnet, which has been erected in connexion with the Hyde Institute, was opened recently. The new building has been erected in the Renaissance style, and has a frontage of 46 ft., the walls being 20 in. thick. The flooring is of oaken cubes, diagonally laid. The plans of the building were prepared by Mr. T. G. Jackson, R.A., and most of the work was carried out by Messrs. Shillito, contractors.

GOLF CLUB HOUSE, BANGOR.—The new golf club house at Bangor was opened recently. The building has been erected at a cost exceeding 1,000*l.* from the plans of Mr. Ernest L. Woods, C.E., Bangor. Messrs. J. and R. Thompson, of Dublin and Belfast, were the general contractors for the work, the plumbing and gasfitting being carried out by Mr. W. Morrow, Bangor.

EXTENSIONS TO THE SANATORIUM, ST. HELENS.—The new extensions to the St. Helens Corporation Sanatorium, at Peasley-cross, were opened on the 26th ult. The enlargements consist of a large pavilion, a small pavilion, a discharging ward, a new mortuary, and sixteen additional bedrooms, the total area now covered being 5a. 3r. 36p. The total cost of the extensions has been 8,750*l.*, and the work has been carried out under the supervision of the Borough Engineer, Mr. G. J. C. Broom, M.Inst.C.E.

READING AND RECREATION ROOMS, BELFAST.—The opening of the new recreation and reading rooms in Northumberland-street, Belfast, took place recently. The new building has been erected from the designs of Mr. W. J. Fennell, architect, and the general contractor was Mr. G. Callen. The plumbing work was entrusted to Messrs. Riddel, Ltd., Belfast; Mr. John I. Law carried out the gas-fitting; and the heating arrangements have been fitted by Messrs. Musgrave and Co.

STAINED GLASS AND DECORATION.

STAINED GLASS WINDOW, CHRIST CHURCH, BELFAST.—This church was recently reopened after having been renovated and repaired. The improvements carried out consist of general repairs, painting, and decoration of the interior. A new stained-glass memorial window, representing the women at the tomb, as recorded by St. Mark, has been placed in the edifice. Messrs. Heaton, Butler, and Bayne, stained-glass artists, of London, executed the work.

SANITARY AND ENGINEERING NEWS.

PROPOSED TUNNEL UNDER THE ELBE.—It is stated that the Hamburg Senate proposes to arrange for the construction of a tunnel under the Elbe. The Clyde tunnel at Glasgow has been taken as a model for this plan. It is intended that the tunnel shall run from the St. Pauli landing-place on the north bank of the river to the Steinwarder bathing establishment on the southern bank. It is proposed that two tunnels of 4·8 mètres internal diameter shall run beneath the river at the two points named, and passengers be conveyed by means of a lift at each extremity of the tunnel. The lifts are to be built to convey twenty, eighty, and one hundred and twenty persons respectively. The time of building is estimated at about from two to three years. It is proposed to collect a small charge upon persons and vehicles making use of the tunnel, with the object of eventually covering the cost of construction and working expenses.

AIR-INLET FOR DRAINS.—A sheet, describing and illustrating a new patent air-inlet for drains, has been sent us by Messrs. Thomas Crapper and Co. Instead of the usual mica flaps, a copper dome is used, to which a sheet-copper counterweight is attached in such a manner as to hang immediately over the opening into the ventilating pipe. External pressure of air is said to open the valve, and internal pressure to close it; but the illustrations do not show clearly how this is effected. The satisfactory working of the inlet depends, to a large extent, on the nice adjustment of the weights of the dome and counterweight.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. R. L. Curtis and Sons, surveyors, have removed their offices from 119 and 120, London-wall, to 11 and 12, Finsbury-square, E.C.——Banks' Fireproof Construction Co. is now known as "Banks' Helical Fireproofing System, Limited."

POLAND AND LITHUANIA.—Reporting on the trade and commerce of these countries for the year 1903, Mr. Consul-General Murray writes from Warsaw that for the preceding two or three years, owing to general depression, little building was done, but last year better times and the wants of the growing population of the towns led to a considerable revival in the building trade. This has had a very good effect, not only on the iron industry, but also on the prices of cement and bricks, and in providing occupation for a large number of artisans and labourers, who otherwise would be hard put to it to find work. The cement syndicate of Poland, started in 1900, was wound up towards the end of 1903, the immediate result of which was a considerable increase in the consumption of that article, owing to the fall of prices from 2r. 75c. to 2r. per barrel of ten pouds (360lb.). The united works of Poland sold in 1902 some 460,000 barrels, whereas in 1903 this figure rose to nearly 1,000,000 barrels, but this rise had no beneficial effect on the industry from the financial point of view, the large output and consequent cheaper production being more than counterbalanced by low prices. The German import of cement during 1903 was practically nil, as competition was out of the question at such low prices, after payment of a duty of about 1r. 50c. per barrel of ten pouds. "If, therefore" (comments Mr. Murray), "German cement cannot compete with the local article it would be all the more difficult for the United Kingdom to find a market in this part of Russia, even were it shipped to Dantzig, and from there by river to Warsaw. The industry must consequently be looked upon as purely local, and can only be of indirect concern to Englishmen interested in this country as giving an idea of the prosperity of trade and industry, the prosperity of the cement industry going hand in hand with the general prosperity of the country." The report goes on to say that the general depression which prevailed for the last four years, and consequent small amount of building carried out, brought down the demand for bricks and building materials to such a low figure that most of the brickfields in Poland, which had sprung up like mushrooms during the previous building fever, had to close again, and but few found it worth while to keep working. In 1903, however, came a renewal of building at Warsaw, which, competition being less, raised the price of bricks again, which stood at from 1*l.* 6s. 6d. to 1*l.* 9s. 6d. per thousand throughout the year, though prices fell off a couple of shillings towards the close. This year (1904) was expected to be an exceptionally good year, as much building was intended, but the war has in this, as in everything else, rendered credit difficult, and much of the proposed construction has been temporarily abandoned. The year 1903 was a good one for the timber trade, which had been in a bad way for the three preceding years. Prices ruled high both in Poland and Lithuania. The export of all sorts of wood for consumption in Germany is increasing, but the demand for wood (especially oak) from this district for the United Kingdom and France is diminishing on account of American competition.

GERMAN CEMENT TRADE.—This subject is dealt with at some length in the annual report of the British Consul-General, from which we gather that, after many fruitless endeavours, a "Sales Union," of fourteen cement works in Rhenish Wesphalia, was formed in December, 1903, and this was followed by the establishment, in January, 1904, of the South German Cement Syndicate, with branch offices at Heidelberg, Würzburg, Stuttgart, Metz, and

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Munich. The Rhenish-Westphalian Syndicate was formed (as a company with limited liability) on condition that a similar contract should be entered into with the South German Cement Works. The extent to which "members" (Gesellschafter) participate, is determined according to their productive capacity, that is to say, one share is allotted to each member for every 1,000 casks of annual production. The aggregate capacity of the fourteen works amounts to about 4,370,000 casks of 170 kilos. per cask, of which 2,337,000 casks were sold in 1902, and 1,181,222 casks in the first six months of 1903. The members bind themselves to sell cement only as agents of the syndicate, that is to say, to bring cement into commerce neither in their own name nor in the name of others, to deposit 1*l.* 5s. in cash for each share as working capital, and 2*l.* 10s. in bills for each share as security. Sales are effected exclusively through the sale office of the company. The syndicate does not sell any cement in its own name. When a member has sold 40 per cent. of his quota, further sales by him can only be effected on condition that the syndicate is empowered to substitute the particular brand sold by that of some other member of the syndicate. The syndicate collects the invoices. Members receive as agency commission whatever they succeed in obtaining for their own brand over and above the purchase price fixed by the syndicate. The price which the syndicate grants to the separate members (calculation price) is fixed every year before October 1 for the following business year. Settlement is effected at the end of the business year, and any surplus is divided among the members in accordance with their shares in the syndicate. If a member has sold less than 25 per cent. of his quota, or if a member, through his own fault, is in arrear with his deliveries, he loses one share of the profit for each 10,000 casks less sold or delivered by him. The organisation of the syndicate comprises the sale office, the committee of management, and the meeting of the members. For the present the export trade is not included in the contract, but while members are permitted to export on their own account and in their own name, they are bound to announce the quantity sold to the sale office. A tax of 5s. for every ton exported is levied by the syndicate. Taking the average of seventy-five cement works, the sale price per cask (170 kilos., exclusive of packing) receded in the year 1902, on account of the severe competition, to 3m. 62pf., compared with 4m. 44pf. in 1901, 5m. 35pf. in 1900, and 5m. 46pf. in 1899. Sixty-five cement factories were working in 1902, with an aggregate capital of 6,933,500*l.*, and 2,500,000*l.* consolidated debts; some works had reserve funds, the majority, however, large book debts. According to particulars issued by a number of works, their sales in 1902 averaged about 60 per cent. of their productive capacity, so that there was at least a slight improvement over the preceding year, in which the average was only 46 per cent. How unremunerative the works were may be judged by the fact that only twenty-eight out of sixty-five made profits amounting, in the aggregate, to 297,000*l.*, while the remainder had deficiencies totalling 215,500*l.*, and nineteen out of these thirty-seven factories had been working at a loss, although fifteen of the whole sixty-five had already undergone financial reorganisation. The dividends of those companies, which were in a position to distribute them, varied between 1 and 15 per cent.. In the year 1900, dividends of, and exceeding, 6 per cent. were distributed by thirty-six companies, in 1902 only by seven; dividends of less than 6 per cent. were distributed by only eleven companies in the year 1900, but by sixteen companies in 1902. In 1900 only fifteen companies were unable to pay a dividend; in 1902, forty-three companies were in that position. Most of the works commenced business in 1903 with diminished stocks and increasing employment. The foreign trade, which has considerably increased in recent years, is still on too small a scale to balance in any degree the disproportion between the capacity of production and the home consumption. Last year the producing capacity was about 30,000,000 casks, but hardly more than 20,000,000 casks were absorbed by the market, and it is obvious that an exportation which does not amount to quite 750,000 tons, or, approximately, 4,500,000 casks, is too insignificant to be of any importance. The cement industry of Upper Silesia showed better returns as to employment, but an increase of prices was not possible on account of the severe competition.

HOUSING IMPROVEMENT AND TRANSFERABLE BUILDING LEASES IN GERMANY.—The German Government (according to a recent report by Mr. Consul-General Schwabach) has prepared a Bill to promote the erection of small dwellings, which are to be unimpeachable from sanitary, moral, and social points of view, and, at the same time, obtainable at a reasonably low rent. One of the greatest obstacles in this connexion is the speculation in land, and in order to counteract this to the utmost extent it is proposed to render it incumbent upon urban and rural communal authorities to lay out and build streets, and parts thereof, whenever and wherever there is a need for dwellings. To encourage private builders to erect houses with healthy and suitably arranged apartments they are to be granted certain facilities in contributing towards the cost of street and road building, and it is intended to set aside any legal hindrances which may exist against granting such builders further advantages as regards reduction of drainage and water rates, building licences, &c. Such privileges are to be accorded to joint stock companies, associations, and limited liability companies proposing to erect houses with small dwellings, without seeking to obtain a larger than the ordinary local rate of interest on the capital invested. In communes with more than 10,000 inhabitants special police regulations are to be issued for the use of living and sleeping rooms. Only such rooms may be used for living or sleeping as are approved as such by the police authorities, and these rooms must contain at least 10 cubic mètres of space and 4 square mètres superficial area for every inhabitant over ten years of age. A large number of other detailed regulations are intended to promote sanitation and morality. It will be the duty of the communes to carry out the supervision of dwellings, while in towns with 100,000 or more inhabitants a special housing office ("Wohnungsant") is to be established. The Imperial Ministry of the Interior, which has already frequently granted building credit at low rates to mutual building societies, has lately purchased a building block of 8,200 square mètres from the Saxon fiscal authorities for 12,000*l.*, which it has assigned to the Dresden Savings and Building Society as a transferable building lease. The four-storied buildings to be erected upon it will contain 300 dwellings, each comprising one to two rooms, a pantry, kitchen, and offices. On the ground floor there is a kindergarten for the children of the tenants, and for the social needs of the adults there will be provided in the basement a club room, with library and reading-room, baths, wash kitchen, and laundry. Each "Wohnung" or set of apartments will have a superficial area of from 38 to 65 square mètres at an annual rent of, approximately, 5s. 6d. per square mètre. During the continuation of the lease, which has been concluded for a term of eighty years, the association pays the Imperial fiscal authorities interest amounting to 288*l.* 10s. per annum for the building plot. It is stipulated that the dwellings are to be let only to workmen, small tradesmen, and lower-grade civil servants, or persons on a social footing with these. Factory premises or workshops may only be erected by special permission, whereas licensed victuallers and the sale of spirituous liquors are prohibited. The rental for the dwellings may not exceed the amount necessary for the interest and amortisation of the capital expended in building the houses and their management and maintenance. A similar contract has been made between the Prussian fiscal authorities and the Civil Servants' Building Society in Berlin, and for the present a plot of fifty acres at Dahlem, near Berlin, has been singled out for the erection of transferable leasehold houses. This contract is for a term of seventy years, and stipulates that factory premises, or other industrial plant causing noise, smoke, or smell, may not be erected at all, and restaurants or public-houses only with the special permission of the authorities, who undertake the laying out of the streets. The association pays the authorities interest at the rate of two per cent. per annum on the value of the plot, which has been fixed at 7s. 6d. per square mètre, the said plot being available only for the erection of houses. Dwellings or sets of more than four apartments may not be erected as single habitations, but only as parts or sections of buildings.

FIBRE TILES.—The Canadian Commercial Agent for New South Wales, Queensland, and New Zealand, in a report to the Department of Trade and Commerce, writes:—"In the cities what is known in the trade as 'French tile' is used for roofing. I have had an inquiry whether a tile is not, or could not be, made of paper pulp that would take the place of the French tile. It may be that, if consideration is given to it, such a tile could be produced by a process somewhat akin to that used in making indurated fibreware. The objection to the French tile is its tendency to absorb moisture, thus increasing its original weight and creating a growth of vegetation that speedily discolours it. A fibre tile would be much lighter, be moisture-proof, preserve its colour better, be less liable to break than either slate or tile, suffer less from expansion and contractions through variation in temperature, and be free from the rattle in a storm characteristic of metal. Could a fibre tile be produced at a moderate cost, there would be a large demand for it in Australia."

BUCCLEUCH HOUSE, RICHMOND.—This fine old house, of the Georgian period, is offered for sale by its present owner, Sir John Whitaker Ellis, Bart., who is about to leave the neighbourhood. The house had latterly been a residence of the Dukes of Buccleuch, and, with its beautiful gardens, and lawn that extends to the bank of the Thames, forms a well-known feature of the river-side just above Richmond Bridge.

REBUILDING IN UPPER THAMES-STREET, E.C.—A site has been cleared on the south side of the street between Broken Wharf and Castle-yard for Messrs. Lever Brothers' new premises, to be erected after plans and designs prepared by the late Mr. F. W. Tasker. The place "is so-called"—says Stow—"of being broken and fallen down into the Thames," and there formerly stood the inn, or town-house of the Bigods and Mowbrays, Earls and Dukes of Norfolk, as well as the engine, which was worked by horse-power, and the water-house set up in 1594 by Bevis Bulmer for supplying that part of London with water raised from the Thames. Bulmer's water-works are depicted in the rare panoramic view, 1610, by Nicholas John Visscher of the river-side, of which an original print is preserved in the King's collection of maps and drawings in the British Museum.

GREEK MARBLE TRADE.—According to the annual report sent to the Foreign office by Mr. Consul Walsh, the British Company, Marmor, Limited, is now pushing the marble trade of the Piræus with vigour, and has acquired most of the more important marble quarries in Greece, including those of the late "Greek Marble Company," at Naxos, Antiparos, and Paros, where lay the quarries of the famous white statuary marble, called "lychnite." This company sent last year to its various markets abroad the not inconsiderable amount of 1,175,238 cubic metres (about 1,537,500 cubic yds.) of different marbles. In addition to the export, there is a good market in the country itself for the white marble, not of the first quality, and the blue Melana marble, of Pentelicus, for building purposes. In this connexion, it is, perhaps, worth mentioning that building blocks of marble, which are specially cut so as to be easily adapted to balconies, window and door frames, etc., form one of the latest developments at these quarries. Great hopes are entertained of the development of the market in the United States of America, where the demand for Greek marble is increasing. The output of the quarries belonging to Marmor, Limited, in 1903, was 5,104,351 cubic metres. By far the larger portion exported went to Germany. The shipments to London were 62,359 cubic metres of Pentelicus marble, 4,564 cubic metres of Styra, and 307 cubic metres of Tinos; 920 cubic metres of Pentelicus marble were also sent to Bristol.

JAVA TEAK.—Mr. Consul Fraser reports to the British Foreign Office that the output of Java teak (*Tectona grandis*) during the year 1903 was most unsatisfactory. This was principally caused by the scarcity of labour, the large rice crop enabling numbers of regular wood-cutters to remain in their villages without working until their supply of rice was consumed. The year was also an abnormally wet one, and, therefore, not in favour of the output, which is estimated at about 3,531,600 cubic ft., as against about 5,650,000 cubic ft. in 1902, and 4,944,000 cubic ft. in 1901. About 353,000 cubic ft. were shipped to South Africa in the form of railway sleepers; the balance was exported as squares, logs, sawn wood, etc., to Europe—chiefly to the Netherlands and the United Kingdom. A few small parcels were shipped to China, and during the last few months of the year regular shipments of from 10,000 to 14,000 cubic ft. were made to Bombay. It would appear that British India promises to be a good market for Java teak. According to the latest official returns, the area of the teak forests in Java at the end of 1900 was 265,175 acres, of which 12,140 acres have been planted by the Netherlands Indian Government, the remainder being of natural growth. The average production of wood per acre may be taken as about 2,825 cubic ft.

ROYSTON CEMENT AND BRICK WORKS.—At the Mart, Tokenhouse-yard, on May 31, Messrs. Fuller, Horsey, Sons, and Cassell offered for sale by auction the freehold property, known as the Royston Cement and Brick Works, situate at Barrington, near Cambridge, about a mile from Shepreth station, on the G.N.R., to which there is a siding. The works occupy, with the farm lands adjoining, a total ground area of about 230a. 2r. 35p., and underlying the estate it is claimed that there are prac-

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tically inexhaustible deposits of cement, marl, and gault clay, suitable for the production of high-class Portland cement and best white facing bricks. Erected on the property (according to the particulars furnished by the auctioneers) are substantial brick buildings, forming the cement and brick works, fitted with modern, fixed plant, machinery, and fixtures, equal to an output of about 300 tons of cement and lime, and 100,000 white facing and gault bricks per week. Included in the lot were also a manager's dwelling-house, offices, mechanics' shops, and stores attached to the works; also a farmhouse and outbuildings, cottages, orchard, barn, etc., let, with the available surface land, at rentals amounting in the aggregate to 170*l.* per annum. It was explained that the entire estate was held in fee simple, subject to annual corn rents amounting to about 35*l.* 10s. The vendors were prepared to give possession of the property on completion of the purchase, and it was suggested by the acting auctioneer that, if a few thousand pounds were spent on necessary repairs, the estate would be worth upwards of 50,000*l.*, though, as it was desired to sell in order to close up certain transactions, a much less sum would be accepted. The first offer made was 12,000*l.*, and this was increased by bids of 500*l.* each to 15,500*l.* As no advance was forthcoming, it was announced that the property was withdrawn; but an intimation was given that for 20,000*l.*, or perhaps a little less, the lot could be secured by private treaty.

WHISTLER'S PEACOCK ROOM.—The famous Peacock Room, which Whistler designed for the late F. R. Leyland, in Prince's Gate, was recently placed in the hands of Messrs. Ernest Brown and Phillips, of the Leicester Galleries, for disposal, and has been purchased from them by Messrs. Obach and Co., who will, in a few days, exhibit it to the public in their rooms in New Bond-street. The removal of this work of art at first appeared most difficult, but on examination it was found that the decoration was separated from the actual structure of the room, and it has been removed and re-erected by skilful workmen in a most complete manner. The public will now have an opportunity of seeing the room exactly as originally designed.

THE ROMAN TOWN UNEARTHED IN DERBYSHIRE.—The results of the recent excavations at the Roman fort of Brough, about midway between Bradwell and Hope, conducted by Mr. John Garstang, of Liverpool University College, are stated, with some details, in the Journal of the Derbyshire Archæological Society. It is considered established that Brough was the Roman station Anavio. The fort, as roughly defined by the excavations, is nearly a regular four-sided and walled enclosure, about 336 ft. inside length and 275 ft. broad, with corners rounded to a curve, and an arched gateway at each side, protected by flanking towers. The most important structure within the walls was the prætorium. The feature in which the greatest public interest is taken is the underground chamber, containing a well. During the excavation there were found numerous stones, animal bones, horns of the deer family, and of oxen, a few small coins of the IVth century, three fragments of a IInd century tablet, two Roman altars, a broken column, a large stone vessel, fragments of pottery, and certain smaller objects. While excavating the chamber, four fragments of a large inscribed tablet were discovered. The inscription tells of the work effected by the commander of Cohort I. of Aquitanians at a time when Julius Verus governed Britain, and Antoninus Pius was Emperor, about the middle of the IInd century. These fragments were all found in the pit or well within the prætorium, and, it is reasonable to believe, that the tablet itself was erected in the same vicinity to commemorate the completion of some work, possibly the building of the fort itself. Perhaps the point of greatest local interest is the name of the cohort, Cohors I. Aqvitanorvm. It is not suggested that this was a detachment specially detailed for engineering work. One of the altars found bears the words "Deo Marti," indicating its dedication to Mars. The objects found are being exhibited at the Buxton Museum. Mr. F. Haverfield (Oxford) has made some notes on the inscription on the tablet, which, he says, may be taken as showing that the fort at Brough was built, or repaired, or at least occupied about A.D. 158, and was apparently rebuilt later. Melandra Castle, near Glossop, with coins of Domitian, Marcus, Julia Mæsa, and Severus, may have been occupied during the same period as Brough. Slack, near Huddersfield, with coins of Nero to Hadrian, may have been both occupied and abandoned sooner. Templeborough, near Rotherham, may have also dropped out of military use before the end of the IInd century.—*Manchester Guardian.*

Legal.

ACTION AGAINST BUILDERS FOR TRESPASS.

THE case of Ward *v.* Swain and others came before Mr. Justice Darling and a common jury in the King's Bench Division on the 31st ultimo—an action by the plaintiff, a general dealer of Tooting, to recover from the defendants, Messrs. Swain and Selby, builders, Mr. Coulson, a contractor, and Mr. Johnson, a man working under the contractor, damages for alleged trespass.

Mr. Biron and Mr. Doughty appeared for the plaintiff, and Mr. Ricketts for the defendants.

Mr. Biron, in opening the case, said the claim was by the plaintiff for damages in respect of a trespass which took place under the following circumstances. The plaintiff was a man who had for some years carried on business in the neighbourhood of Tooting as a general dealer, and he also combined with that farming. In August, 1902, plaintiff obtained the tenancy of a house and land, called Bygrove House, Tooting—a tumbledown old building which had been allowed to fall into disrepair. The house and land, however, suited the plaintiff, and he had it upon an agreement by which he could be compelled to give up possession on a month's notice. The plaintiff held the house and land from the Heaver trustees, who were anxious to sell for the purpose of developing for building. The trustees entered into a contract to sell to Messrs. Swain and Selby, but they forgot to give his client a month's notice. In February of this year, the defendants came on to the plaintiff's land and, without leave or licence, committed the acts of trespass complained of—viz., damaging the fences, and cutting down trees, etc.

His lordship asked what the defence was.

Mr. Ricketts said that the defence was that defendants had leave and licence to go upon the land, and, further, that the plaintiff had notice to give up possession.

The plaintiff, in his evidence, said that on February 17, he gave the defendants leave to deposit some scaffolding poles on the ground, Messrs. Swain and Selby stating that they had bought the land for building purposes. Plaintiff said this was news to him, as he had received no notice to quit. Later in the day, the defendants, without leave, broke down one of his fences, and put some scaffolding on the land. On February 18, defendants burnt the bushes and pulled down the trees on the land, and erected a carpenter's shop in the orchard. On February 25 an interim injunction was granted restraining the defendants from interfering with the land during his tenancy.

For the defence, Mr. Harry Coulson stated that at no time did the plaintiff make any protest against what they did. In fact, the plaintiff gave permission for the scaffolding, etc., to be placed on the land.

In the result the jury awarded the plaintiff 25*l.* damages.

Judgment accordingly.

THE LIABILITY FOR DEFECTIVE DRAINS.

AT the West London Police Court recently, there was a summons against Mrs. Nunn, of Binfield-road, Clapham, in respect of an alleged defective drain at 45, Melrose-gardens, West Kensington. Mr. A. B. Watson supported the summons on behalf of the Hammersmith Borough Council; and Mr. Stuart Bevan, barrister, represented the defendant. Complaint was received from the occupier of the house about bad smells, and the sanitary inspector made a test and found a leakage. Notice was then served on the owner containing a detailed account of the work necessary to be done to remedy the defect. Mr. Watson pointed out that the owner had not availed herself of the right of appeal to the London County Council, as provided in section 211 of the Metropolis Management Act, and, therefore, according to the decision laid down in "Clerkenwell Vestry *v.* Feary," the only question for the magistrate to decide was whether the notice was properly made out and served. Mr. Stuart Bevan contended that, inasmuch as the requirements set out in the notice really amounted to a reconstruction of the whole drainage system in the house, the question of the validity of the notice was quite within the province of the magistrate. The requirements, continued learned counsel, were precisely similar to those established under the London County Council's regulations of 1901; and, as the latter only applied to new buildings, the Borough Council were clearly endeavouring to put on the owner an obligation that was not even imposed by the London County Council. The Borough Council could, if the drains were irreparable, have instituted proceedings under the Public Health (London) Act in respect of a nuisance. Mr. Rose decided, on the point of law, that the notice was a construction notice, and, therefore, liable to revision at his hands; and, after hearing evidence, he held that the notice was invalid, and dismissed the summons.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

10,005 of 1903.—E. F. CLARKE: *Burners for Gas Stoves, and other similar purposes.*

According to this invention the area of the orifice through which the gas is injected into the mixing chamber or tube is capable of being varied from that necessary to pass the maximum quantity of gas required; for example, by a stove of the maximum heating capacity to that required for a stove of the smallest capacity, or to a complete closure of the orifice so that thus the flame is capable of being regulated with precision to the extent required to ensure perfect combustion and the highest efficiency. According to the invention, also a movable member is mounted upon the gas inlet pipe, and means are provided for regulating the position of this member with reference to the gas inlet pipe to vary the quantity of gas passing into the mixing tube or chamber. This member advantageously consists of a valve-stem, adapted to enter the gas inlet pipe to any required extent, so as partially or wholly to close it, and this valve stem may be provided with a tapered extremity, or, as is preferable, with a number of inclined faces, by means of which the annular space between the valve-stem and the gas inlet pipe orifice, or the space between the inclined faces on the valve-stem, and the gas inlet pipe orifice, is adjusted in area, and thus admits a greater or less quantity of gas as may be required according to the size and capacity of the stove, and according to the height and extent of flame required.

10,013 of 1903.—A. GOLIGHTLY: *A Safety Support for Window Cleaners, and others.*

A safety support for the use of window cleaners, and others, consisting essentially of two bars held parallel with one another by crossbars, one end of each of the said parallel bars being upturned and returned; rings at the ends of the bars opposite to the upturned ends; a bar to slip through the said rings and of greater length than the probable greatest width of the window opening, in connexion with which the support is likely to be used: runners free to slide on the parallel bars near the upturned ends of the said bars; a hanger to each runner, and having a projecting and somewhat upwardly-inclined arm, the free end of which is bifurcated; a pin upstanding from each runner, and a platform having holes to put over the said pins.

10,891 of 1903.—J. C. SELLARS: *Moulding Bricks, Blocks, and other articles.*

According to the invention, a base-plate or support is provided, to which are attached a plurality of parallel or substantially parallel plates or partitions, at any desired distance apart; and at the end of same, and at right-angles thereto, a removable board or boards or plates which board or boards or plates are adapted to rest on or against the parallel plates or partitions. The ends of the plurality of moulds so formed are closed by means of a plate which is adapted to move up to, and close the moulds during the moulding operation, and be removed when the moulding of the articles is completed, and it is required to eject them. This end plate, may, in some cases, be hinged or pivoted to the base-plate or support, and swung into and out of position as desired (a suitable stop or stoppers being provided to retain it when in position for moulding), or the plate may slide in grooves provided on the base-plate for this purpose. The side of the mould or moulds is removable, as stated, and comprises (when ornamentations or patterns are to be imparted to the articles being moulded), two movable boards or plates, preferably of wood, the inner board, *i.e.*, the board next to the row of moulds and having the patterns on it, being drawn back and away from the parallel partitions after the moulding operation is completed, and it is required to eject the moulded articles.

11,075 of 1903.—O. DIETRICHKEIT: *Iron Insertions for Cement or Beton Ceilings, Floors, and Roofing.*

Flat-iron insertions for concrete ceilings and roofing of great supporting power, and having

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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a large supporting surface for concrete, thus avoiding the danger of the latter being cut through, characterised by the flat-iron throughout its length—between the ends bent in the well-known manner round the cross-iron situated on the well—being twisted round its own axis into a spiral shape as often as required, so that its cross-section continues to be brought into different positions, and invariably in the same direction of twist.

13,057 of 1903.—H. C. WEBB and A. A. WEBB: *Bath-water Systems of Private Dwelling-houses.*

A bath-water system, supplying a bath from a clothes-boiling furnace or copper, or the like, which consists in providing means for closing the open top of the furnace or copper watertight or airtight, and arranging in conjunction with this closing, water, air, or steam-pressure supply, by which the water in the furnace can be forced or made to flow out of the furnace into the bath.

15,283 of 1903.—W. MEAKIN: *Windows.*

According to this invention, the slides and the slide rails of the sashes are cross rebated, and to effect this economically, the machine-moulded lengths of wood are prepared with a groove on their contiguous faces of a depth equal to the intended rebate. At the pivot, the full width of the rail is cut away to this depth, and replaced by a metal piece strengthening it, and forming also a bearing for the pivot. The rebates above and below the pivot are then readily formed by cutting away the wood to the right or left of the groove provided.

17,366 of 1903.—A. CLARK: *Folding or Collapsible Gates, Window Guards, and the like.*

The invention consists in a form of collapsible frame, in which a series of horizontal members are guided by vertical posts and connected together by links forming a lazy tongs arrangement, having balance weights provided if necessary to facilitate the raising or lowering of the frame. In carrying the invention into effect, according to one form, the vertical guide-posts are formed of T-section, the horizontal sliding members consisting of two bars riveted together with distance pieces between them. Two or more of these horizontal members are provided with a roller at each end, which rollers work on the guide-posts. The connecting links are pivoted to the horizontal bars at the centres of the former, the ends of the connecting links being provided with pins adapted to work in horizontal slots in the sliding bars. By means of these links the horizontal members are kept parallel and equidistant.

17,673 of 1903.—THE COALBROOKDALE COMPANY, LTD., and D. SINCLAIR: *Fireplaces.*

A fireplace, consisting in the combination with a fire basket of a canopy or sliding shutter, and a back brick projecting forward almost, or quite to, the canopy or sliding shutter, and having a series of holes or notches cut through the upper part for the escape of the gases whereby the residual heat of these gases is largely taken up by the brickwork and radiated into the room.

26,737 of 1903.—F. HARPER and A. DOMAN: *Hinges.*

Hinges, characterised by the top and bottom sockets being attached to, or forming part of, a back plate, which is so slotted that the strap and pins are secured thereto with the back of the strap knuckle working flush with the back of the plate.

5,371 of 1904.—C. A. SOUTHWICK: *Automatic Controllers for Return Traps of Heating Apparatus.*

In a heating apparatus having a steam generator, means, including a return trap, to return condensation water to the generator, a receiver in which such water collects, and an inlet for the trap, communicating with the receiver, the construction, arrangement, and use of means to control automatically the speed of operation of the trap in accordance with the rate of accumulation of the condensation water in the receiver.

5,651 of 1904.—G. BARKER (C. H. Phillips): *Apparatus for Flushing Water-closets, Supplying Domestic Boilers, and other similar purposes.*

This consists in the combination with a tank having an outlet, of an inlet valve, and automatic means for opening the inlet valve when the tank is emptied, and closing the inlet valve when the tank is filled, comprising an open receptacle for water which is filled and emptied in the operation of such means, the capacity of which receptacle is such that when filled it will exert an excessive valve-closing pressure on the inlet valve.

7,035 of 1904.—P. JENSEN (C. Arnesen): *Extension or Dining-room Tables, and the like.*

This invention relates to an extensible rail for dining-room tables, and the like. The connexion between the staves or bars of the rails is formed by clamping-irons, which are fixed on the bars near their ends and slide in grooves in the outer edges of the adjoining bars. These clamps are so arranged that one such at the one end of the rail engages with grooves in the adjoining bar, whilst the clamp at the opposite end of the rail is fixed on the last-named bar and engages with the grooves in the outer edges of the first-named bar. In this manner any two neighbouring bars of the rail engage with each other by means of two clamps, of which one is fixed on one of the bars at one end of the rail, while the other is fixed on the other bar and at the opposite ends of the rail. As these clamps are fixed at opposite ends of the adjoining sides of two bars, they serve at the same time as stops, which prevent the bars from being pulled quite apart. Stoppers are also applied for the return, a piece of wood being for this purpose inserted in that end of the groove where the rail slides out. The edges compassed by the clamps are a little narrower than the bars themselves, in order that the ends shall not reach beyond them.

7,557 of 1904.—J. P. PIKE: *Gas Stoves.*

A gas stove, distinguished by having the burner or burners arranged in the passage in such a way that the heat, travelling along the passage, passes round the outside of the oven, boiler, or other chamber to be heated before escaping into the flue.

7,764 of 1904.—G. LEVY: *Certain kinds of Latches for Doors, and other similar hinged parts.*

A door or like latch in which a sliding spindle, to which is attached knobs, carries an inclined piece, to act upon another inclined piece of a shifting locking bolt, which is thereby operated to release or free the catch-piece of the latch.

12,372 of 1903.—A. S. NELSON AND A. STEWART: *Valve Apparatus for Controlling the Discharge of Water, Spray, Sand, or the like, on roadways and other tracks.*

The apparatus comprises an outer casing of cast-iron or other suitable metal, preferably constructed in two portions, with flanges for the purpose of bolting the portions together. An inner plug is provided, formed in such a manner, and provided with such holes or ports suitably shaped as will, upon the plug being caused to revolve, bring the holes or ports into such position as will allow the liquid to flow from the main pipé, either from above or below the plug, to any of the desired directions, either singly or conjointly at will, through branch pipes to perforated pipes or sprinklers situated in any convenient position upon the vehicle. A spindle provided with a hand-wheel or lever, or handle, or the like, is furnished with indicating letters, figures, or other characters to indicate the position of the holes or posts in the valve, and suitable stops are also provided for the purpose of locking the controlling device in the "off" or in any other desired position.

5,713 of 1904.—G. H. THURSTON: *Rock and Ore Breakers.*

A rock and ore breaker, consisting of a crushing head formed of a vertically grooved cone-shaped core portion, having cam surfaces extending to the grooves, and a cone-shaped mantel provided with lug mechanism engaging cam surfaces of the core portion, whereby both parts are held in engagement and rotated simultaneously in operation, or may be separated whenever desired.

6,830 of 1904.—D. D. MCBEAN: *A Method and Means for the Construction of Subaqueous Tunnels and the like.*

A tunnel construction, consisting of a fixed subaqueous working chamber, covering and enclosing the site, or a cross sectional portion thereof, a section of the upper portion of the tunnel tube constituting the roof thereof, and the walls thereof being seated upon bed-rock, or extending to a sufficient depth in other material to prevent lateral inflow during the work of excavation.

7,437 of 1904.—W. L. H. HAMILTON: *Manufacture of Metal Pieces or Tessaræ, used in the Construction of Mosaics.*

This invention has for its object to protect the pieces or tessaræ composed of two or more layers of material by covering with an upper or surface layer of glass or enamel the edges and sides of each piece or tessaræ in such a manner as to give to the under layers complete protection from damp, and, at the same time, to render impossible the falling away of the glazed or enamelled surface.

7,605 of 1904.—F. VON HARDTMUTH: *Lead Pencils, Crayons, and the like.*

A pencil having a movable core or "lead," and provided with a hook or the like for pulling out and fixing the said core in position, the said hook or the like being made of wood, fibrous material, ebonite, horn, or the like, and provided with an enlarged end part having an inclined surface, by means of which the core can be wedged in the desired position.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 14.—By DILLEY, SON, & READ (at Huntingdon).

Alconbury Weston, Hunts.—"The Hill Farm," 96 a. 1 r. 8 p., f. and c., y.r. 125*l.* £2,300

Brington, Hunts. — A freehold farm, 221 a. 1 r. 10 p., y.r. 160*l.* 2,350

May 19.—By WALTER LUDLOW & BRISCOE (at Birmingham).

Knowle, Warwick.—"The Springfield Hall Estate," 616 a. 3 r. 28 p., f. (in lots) 23,585

By W. & S. FREEMAN (on the premises).

Highbury.—19 and 21, Hamilton-rd. (Highbury Park Livery Stables), u.t. 16 yrs., y.r. 72*l.* 10s. (with goodwill)..... 310

May 20.—By THOMAS HAWKES & Co. (at Minehead).

Cutcombe, Somerset. — "North Wheddon Farm," 90 a. 2 r. 5 p., f. 2,875

By DOWSETT, KNIGHT, & Co. (at Walthamstow).

Walthamstow.—4 to 10 (even), Colebrook-rd., u.t. 72 yrs., g.r. 13*l.*, w.r. 119*l.* 12s. 490

May 24.—By FRASER & HEIGH.

Kentish Town.—59 to 71 (odd), 77, 79, and 81, Leverton-st., u.t. 61 yrs., g.r. 26*l.*, y.r. 40*l.* 4,855

26, 28, 30, 32, 33, 35, and 37, Falkland-rd., u.t. 58 yrs., g.r. 28*l.*, y.r. 313*l.*..... 3,480

By SIMMONDS & Co.

Norwood.—6, Shirley-villas, u.t. 92 yrs., g.r. 6*l.*, y.r. 30*l.* 290

By WAGSTAFF & SONS.

Holloway.—62 and 64, George's-rd., area 4,500 ft., f., p..... 480

May 25.—By BISLEY & SONS.

Bermondsey.—76 to 81, Enid-st., u.t. 13 yrs., g.r. 18*l.*, w.r. 202*l.* 16s. 620

9 and 10, Cadbury-rd., u.t. 62 yrs., g.r. 9*l.*, w.r. 75*l.* 8s. 580

By W. BRACKETT & SONS.

Catford.—10, Rushey-green (s.), u.t. 77 yrs., g.r. 20*l.* 6s., y.r. 55*l.* 625

By DYER, SON, & HILTON.

Lewisham.—17 and 18, Lewisham-pk., u.t. 70 yrs., g.r. 24*l.*, y.r. 120*l.* 950

26 and 29, Lewisham-pk., u.t. 70 yrs., g.r. 4*l.*, y.r. 120*l.* 1,330

53, Lewisham-pk., u.t. 70 yrs., g.r. 15*l.*, y.r. 70*l.* 550

Lewisham-pk., l.g.r. 9*l.*, u.t. 70 yrs., g.r. nil yrs. 180

Dulwich.—76, Adys-rd., u.t. 71 yrs., g.r. 5*l.*, y.r. 34*l.*..... 340

By GREEN & LINES.

Chiswick.—34 to 40 (even), Annandale-rd., u.t. 75 yrs., g.r. 25*l.* 4s., y.r. 201*l.* 10s. .. 1,355

By V. S. LEIGH.

Old Ford.—27 and 29, Ford-st., u.t. 59 yrs., g.r. 12*l.*, w.r. 91*l.* 385

Peckham.—104, Kimberley-rd., u.t. 69½ yrs., g.r. 4*l.* 10s., e.r. 36*l.* 265

By MATTHEWS, MATTHEWS, & GOODMAN.

Holloway.—Hillmarten-rd., l.g.r. 16*l.*, u.t. 88 yrs., g.r. 2*l.* 230

By GUY & SON (at Hailsham).

Hellingly, etc., Sussex. — "Bowlers" and "Haglye" Farms, 136 a. 1 r. 38 p., f. (in lots) 2,775

By N. EASTON & SON (at Hull).

Brough, Yorks.—"Glenrock" and 12 a. 1 r. 0 p., f. 6,300

May 26.—By CHANCELLOR & SONS.

Kew Green, Surrey.—"White House," f., p. 850

By C. C. & T. MOORE.

Hackney-road.—Nos. 293 and 295 (s.), f., y.r. 85*l.* 1,060

Commercial-road East.—27, White Horse-st. (s.), f., w.r. 20*l.* 16s. 205

Stepney.—11 and 15, Brenton-st., c., w.r. 54*l.* 12s. 475

9, Repton-st., c., w.r. 27*l.* 6s. 225

35, Samuel-st., c., w.r. 26*l.* 255

Limehouse.—90, 92, 94, and 94A, West India Dock-rd. (shops and workshops), area 5,000 ft., f., y.r. 146*l.* 10s. 2,220

64, West India Dock-rd. (s.), c., e.r. 55*l.* .. 615

5, Limehouse-causeway (s.), c., e.r. 55*l.* 515

Poplar.—439 and 441, East India Dock-rd., u.t. 69 yrs., g.r. 10*l.* 10s., y.r. 60*l.* 560

By HARRIS STACEY.

Reigate, Surrey.—Wray Park, "Brightlands" and 1¼ acre, f., y.r. 130*l.* 2,350

By STIMSON & SONS.

Fulham.—Stephendale-rd., f.g. rents 164*l.* 7s., reversion in 92 yrs..... 4,125

Chiswick.—Fielding-rd., f.g.r. 5*l.*, reversion in 92 yrs. 125

Forest Gate.—Romford-rd., f.g. rents 12*l.*, reversion in 81 yrs..... 315

Sutton, Surrey.—Ringstead-rd., f.g. rents 40*l.*, reversion in 84 yrs..... 1,000

Forest Hill.—Upper Colfe-rd., four freehold residences (named), y.r. 109*l.* 16s. 1,000

Battersea.—104 and 106, Livingstone-rd., u.t. 60½ yrs., g.r. 11*l.*, w.r. 72*l.* 16s. 410

15, 17, and 19, Howie-st., f., w.r. 91*l.* 880

Balham.—119, Broomwood-rd., u.t. 75½ yrs., g.r. 7*l.* 7s., y.r. 41*l.*..... 350

New Cross.—6 and 7, Eckington-gdns., u.t. 71½ yrs., g.r. 9*l.*, w.r. 67*l.* 12s. 550

59, 61, 65, and 67, Barlborough-st., u.t. 71½ yrs., g.r. 16*l.* 10s., w.r. 141*l.* 14s. 1,165

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By D. L. GOOCH.

Acton.—20 and 22, Gloucester-rd., u.t. 61 yrs., g.r. 12*l.*, w.r. 62*l.* 8s. £400
Anerley.—102 and 106, Croydon-rd., u.t. 91½ yrs., g.r. 24*l.*, y.r. 120*l.* 1,150

By STOKES & PINDER.

Caledonian-road.—155, Copenhagen-st. (s.), u.t. 36 yrs., g.r. 24*l.* 10s., y.r. 104*l.*..... 475

By VENTOM, BULL, & COOPER.

Barking Creek, Essex.—Fisher-st., "Lower" and "Bangor" Wharves, f., y.r. 750*l.* .. 5,000

By WALTON & LEE.

Lewes, Sussex.—"The Malling House Estate," ¼ 51 a. 2 r. 14 p., f. 9,500

By WORSFOLD & HAYWARD.

Camberwell.—20, 22, 24, and 26, Mawbey-rd., f., y.r. 153*l.* 8s. 1,750

By BARBER & SON (at Wellington).

Malinslee, etc., Salop.—The Old Park and Stirchley Estate, area 180 a. 1 r. 20 p., f., including mines and minerals (in numerous lots) 3,015

May 27.—By W. A. BLAKEMORE.

Kilburn.—167, 169, and 171, Canterbury-rd., u.t. 59 yrs., g.r. 18*l.*, w.r. 93*l.* 12s. 735

By DOLMAN & PEARCE.

Holloway.—39 and 41, Pemberton-ter., u.t. 80 yrs., g.r. 10*l.*, y.r. 90*l.* 960
Hampstead.—5, Lawn-rd., u.t. 46¼ yrs., g.r. 17*l.*, e.r. 85*l.* 650

By PERCIVAL HODSON.

Stamford Hill.—6, 14, and 16, St. Andrew's Pavement (s.), u.t. 79 yrs., g.r. 30*l.*, y.r. 250*l.* 3,600
Tottenham.—427, West Green-rd. (s.), u.t. 63 yrs., g.r. 7*l.* 10s., y.r. 36*l.* 320

By REYNOLDS & EASON.

Islington.—Arlington-sq., l.g. rents 63*l.*, u.t. 23 yrs., g.r. 25*l.* 4s. 435
Linton-st., l.g. rents 55*l.*, u.t. 23 yrs., g.r. 21*l.* 380
Walthamstow.—19 and 21, East-av., f., y.r. 72*l.* 950
Kingston, Surrey.—Eden-st., freehold granary and malting premises, area 12,000 ft., p. (including goodwill) 1,570

By A. J. SHEFFIELD.

Hackney Wick.—26, 28, and 30, Victoria-rd., u.t. 61 yrs., g.r. 15*l.*, w.r. 101*l.* 8s. 670
Poplar.—76, 78, 88 to 94 (even), Teviot-st., u.t. 61 yrs., g.r. 25*l.* 10s., w.r. 218*l.* 4s. .. 1,840
Blackwall.—22, Prestage-st., f., w.r. 31*l.* 4s. .. 325
Stepney.—1 to 9 (odd), Duckett-st., u.t. 13 yrs., g.r. 12*l.* 12s., w.r. 81*l.* 18s. 250

By S. WALKER & SON.

Whitechapel.—39, 45, 47, and 51, Whitechapel-rd. (s.), f., y.r. 435*l.* 8,480
49, Whitechapel-rd. (The Victorian Restaurant), f., y.r. 120*l.* 2,650

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, JUNE 3.

Royal Institution.—Professor Svante Arrhenius, of Copenhagen, on "The Development of the Theory of Electrolytic Dissociation." 9 p.m.

SATURDAY, JUNE 4.

Royal Institution.—Sir W. Martin Conway, M.A., on "Spitsbergen in the XVIIth Century," II. 3 p.m.

Northern Architectural Association.—Visit to West Hartlepool.

British Institute of Certified Carpenters.—The Annual Dinner, at the Holborn Restaurant. 7 p.m.

Institute of Sanitary Engineers.—Visit to the new buildings of the University College Hospital, Gower-street, London, W.C. 3 p.m.

MONDAY, JUNE 6.

Royal Institute of British Architects.—(1) Special General Meeting. The Chairman to move that the following words be added at the end of the first clause of by-law 3:—"After the 31st December, 1906, every person desiring to be admitted a Fellow shall be required to have passed the Examination or Examinations qualifying him as an Associate. But in special cases the Council by the votes of three-fourths of such Members of the Council as are present and voting at a meeting of the Council shall have power to dispense with such Examination or Examinations." (2) The Fifteenth General Meeting (Business and Ordinary). (*a*) To receive the Report of the Scrutineers appointed to direct the election of the Council, Standing Committees, etc., for the year of office 1904-5. (*b*) To elect candidates for membership under By-laws 7, 8, and 9. (*c*) To resume the discussion on "The Plenum System of Ventilation," adjourned from the Meeting of December 4 last, on the occasion of the Paper by Messrs. Wm. Henman and Henry Lea on the Royal Victoria Hospital, Belfast. 8 p.m.

Society of Engineers.—Mr. Percy G. Scott on "Railway Surveys and Design in New Countries." 7.30 p.m.

THURSDAY, JUNE 9.

Institution of Electrical Engineers.—Annual General Meeting. 5 p.m.

SATURDAY, JUNE 11.

Edinburgh Architectural Association.—Visit to Castle Campbell.

St. Paul's Ecclesiological Society.—Visit to the Church of St. Mary-le-Bow, at 2.30 p.m., and afterwards to St. Mary Aldermary at 3.15, and St. Mildred, Bread-street, at 3.45, under the guidance of Mr. Philip Norman, F.S.A.

TO CORRESPONDENTS.

G. G.—R. B.—F. T. (Below our limit).—H. S.—J. F. S. (Amounts should have been stated). — A. H. M. (Next week).

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We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents, sent to or left at this office, unless he has specially asked for them.

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We are compelled to decline pointing out books and giving addresses.

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PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks ...	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" at railway depôt.
Red Wire Cuts ...	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire ...	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks.....	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats.....	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers...	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints.	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats.....	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers...	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand.....	7 3	per yard, delivered.
Thames Ballast.....	6 0	" "
Best Portland Cement	30 0	per ton, "
Best Ground Blue Lias Lime	21 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 2½	" "

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks...	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality*

	s. d.	
Scappled random blocks	2 10	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "

STONE.—(*continued*).

	s. d.	
6 in. rubbed two sides		
ditto, ditto	2 6	per ft. super. deld. rly. dpt.
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube, "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides (slabs random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube,
" " " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt
" " " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 first quality "	13 0 0	" "
20 × 12 " " "	13 15 0	" "
16 × 8 " " "	7 5 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 "	6 12 6	" "
20 × 10 best Eureka unfading green .	15 17 6	" "
20 × 12 " "	18 7 6	" "
18 × 10 " "	13 5 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 12 6	" "
18 × 10 " "	9 12 6	" "
16 × 8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles .	42 0	per 1000 at rly. depôt.
Hip and Valley tiles ...	3 7	per doz. " "
Best Brosely tiles.....	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " "
Hip and Valley tiles ...	4 0	per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire do. (Peakes).....	51 9	per 1000 " "
Do. Ornamental do.....	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles.....	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000 " "
Do. pressed.....	47 6	" " "
Do. Ornamental do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD.

	At per standard. £ s. d.	At per standard. £ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4.....	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in....	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in....	8 10 0	9 10 0
Foreign Sawn Boards—		
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
⅔ in.	1 0 0	"
	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.) ...	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0
JOINERS' WOOD.		
White Sea: first yellow deals,	At per standard.	
3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.....	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.....	18 0 0	19 10 0
Battens.....	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.....	14 10 0	16 0 0
Battens.....	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.....	13 10 0	14 0 0
Do. 3 in. by 9 in.....	13 0 0	14 0 0
Battens.....	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens.....	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0

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WOOD.—(*continued*).

	At per standard. £ s. d.	£ s. d.
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Dantzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 6
Small "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
½ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks—per ft. cube	0 4 0	—
	Per square.	
Prepared Flooring—		
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ...	7 5 0
Compound Girders, ordinary sections	8 2 6 ...	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ...	8 17 6
Flitch Plates	8 5 0 ...	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ...	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 5 0 ...	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0 ...	8 5 0
Staffordshire "Marked Bars"	10 0 0 ...	—
Mild Steel Bars	8 15 0 ...	9 5 0
Hoop Iron, basis price	9 5 0 ...	9 10 0
" Galvanized	17 10 0 ...	—
("And upwards, according to size and gauge.)		
Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ...	—
" " 24 g.	10 15 0 ...	—
" " 26 g.	12 5 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ...	—
Ordinary sizes to 22 g. and 24 g.	13 5 0 ...	—
" " 26 g.	14 5 0 ...	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ...	—
" " 22 g. and 24 g.	16 10 0 ...	—
" " 26 g.	18 0 0 ...	—
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0 ...	—
" " 22 g. and 24 g.	13 0 0 ...	—
" " 26 g.	13 15 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0 ...	—
" " " 26 g.	14 0 0 ...	—
Cut nails, 3 in. to 6 in.	9 0 0 ...	9 10 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 7 6 ...	—
Pipe in coils	14 17 6 ...	—
Soil pipe	17 7 6 ...	—
Compo pipe	17 7 6 ...	—
ZINC—Sheet—		
Vieille Montagne ...ton	27 5 0 ...	—
Silesian	27 0 0 ...	—
COPPER—		
Strong Sheet...per lb.	0 0 10½ ...	—
Thin " ... "	0 0 11½ ...	—
Copper nails ... "	0 0 11 ...	—
BRASS—		
Strong Sheet ... "	0 0 10 ...	—
Thin " ... "	0 0 11 ...	—
TIN—English Ingots ... "	0 1 4 ...	—
SOLDER—Plumbers' ... "	0 0 6½ ...	—
Tinmen's ... "	0 0 8 ...	—
Blowpipe ... "	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

	2½d. per ft. delivered.
15 oz. thirds	2½d. " "
" fourths	1⅞d. " "
21 oz. thirds	3½d. " "
" fourths	2⅝d. " "
26 oz. thirds	4d. " "
" fourths	3⅛d. " "
32 oz. thirds	5d. " "
" fourths	4¼d. " "
Fluted Sheet, 15 oz.	3d. " "
" 21 oz.	4d. " "
½ Hartley's Rolled Plate	1⅝d. " "
⅜ " " "	1⅛d. " "
¼ " " "	2⅜d. " "

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes or barrels . per gallon	0 1 5
" " " in drums "	0 1 8
Boiled " " in pipes or barrels . "	0 1 8
" " " in drums "	0 1 11
Turpentine, in barrels "	0 3 7
" in drums "	0 3 9
Genuine Ground English White Lead per ton	19 0 0
Red Lead, Dry "	19 0 0
Best Linseed Oil Putty ... per cwt.	0 6 6
Stockholm Tar ... per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

PUBLISHER'S NOTICES.

Nat. Tel., 6113, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXV. (July to December, 1903) was given as a supplement with issue of January 9 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each.

THE EIGHTY-FIFTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, &c., &c.

Six lines or under ... 6s. 0d.
Each additional line ... 1s. 0d.

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PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps must not be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE noon on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS advertising in "THE BUILDER" may have *Replies addressed to the Office*, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BALRATH (co. Meath).—For the erection of a new wing and alterations to residence and stables at the Grove, Balrath, for Mr. F. Douglas Osborne. Mr. F. Shaw, architect, 36, South Frederick-street, Dublin :—

Smith Bros.	£2,100	McDonnell, Drogheda*	£1,790
H. Henly	1,820		

BRISTOL.—For the erection of first section of All Saints Church, Fishponds. Messrs. Lingen Barker & Son, architects, 9, Clare-street, Bristol :—

W. Hopkins	£4,300	G. Humphreys & Son	£3,443
A. S. Ingleton	4,186	E. Love	3,310
H. A. Forse & Son	4,158	R. Wilkins & Son	3,189
A. E. Denby & Co.	4,109	E. Clark, Bristol*	3,113
Stephens & Bastow	3,873	S. H. Eastwood	2,993
E. Walters & Son	3,537		
J. Browning	3,488		

CHESTER-LE-STREET.—For water-supply works at Usworth, for the Rural District Council. Mr. J. H. Mole, surveyor, Chester-le-street. Quantities by Surveyor :—

J. Tweddle & Co.	£995 14 6	J. Coton & Son	£708 11 3
J. Archibald	893 15 0	Bushby & Sons	679 18 3
W. Straughan	871 14 10	W. Elliott	647 17 4½
W. & T. Lant	825 0 3	J. G. Rutter & Sons, Washington Station*	618 19 11
J. Carrick	795 10 0		
Bland & Co.	789 10 0		
J. Laidler & Son	714 9 7		

[Surveyor's estimate, £667 4s. 6d.]

CLONES.—For additions and improvements to Ardrumsee Church, for the Very Rev. L. J. Canon O'Neill. Mr. W. A. Scott, architect, 72, Hollybank-road, Drumcondra, Dublin :—

P. Duffy, Carrickmacross* ... £728 2 0

COMPTON (Berks.).—For building villa residence, for Mr. W. A. Hughes. Messrs. Cowell & Shaw, architects, 49, Finsbury-pavement, E.C. :—

H. J. Trinder, Caversham, Oxon* ... £325

CROYDON.—For about 900 yds. of 12-in. and 900 yds. of 9-in. sewer, Plough-lane, Beddington, for the Rural District Council. Mr. R. M. Chart, Surveyor, Town Hall, Croydon :—

Johnson & Langley, Silver Arcade, Leicester* ... £2,200

CROYDON.—For erecting two padded rooms at infirmary, Mayday-road, for the Guardians. Mr. F. West, surveyor, 23, Coombe-road, Croydon :—

Sedgwick Bros., Trant-road, Thornton Heath* £109

EAST GRINSTEAD.—For sewerage works, Forest-row, for the Rural District Council. Messrs. Bailey-Denton, Lawford, & Symons, engineers, 9, Bridge-street, Westminster :—

Pethwick Bros.	£13,941 0 0	Dixon & Co.	£11,846 2 2
W. Manders	13,020 0 9	Wilkinson Bros.	11,334 0 0
F. Osenton	12,691 0 0	Peerless, Dennis, & Co.	11,267 0 0
F. W. Trimm	12,543 0 0	J. Jackson, Forest Gate*	11,140 8 1
B. Cookes & Co.	12,513 0 0	J. G. Pickard	10,054 13 2
Killingback & Co.	12,485 0 0		
J. & T. Binns	12,414 16 8		
Wallis & Co.	11,948 4 5		

EXETER.—For new wall along the riverside, from Exe Bridge to Shooting Marsh Stile, for the City Council. Mr. T. Moulding, City Engineer and Surveyor :—

W. Harris, Clysthydon, near Exeter .. £3,695 19 0

FERRYHILL (co. Durham).—For rebuilding the Black Bull Inn. Mr. Stephen Wilkinson, architect, 30, Mosley-street, Newcastle-on-Tyne :—

C. Groves	£1,583 0 0	Manners	£1,435 0 0
Young	1,575 17 6	Mann	1,405 10 0
W. Foster	1,552 0 0	Howe, West Hartlepool*	1,400 0 0
Draper & Son	1,450 0 0		

GUILDFORD.—For converting the old boiler house at Millmead into a public mortuary, for the Town Council. Mr. C. G. Mason, Borough Surveyor, Tuns Gate, Guildford :—

A. J. Gibson	£320	A. Franks	£258
R. Wood	274	R. Smith, Guildford*	238
Tribe & Robinson	262		

HITCHIN.—For erecting block of three shop premises in Brand-street, for Mrs. Robert Hood Baker. Mr. Walter Graves, architect, Winchester House, London, E.C. Quantities by Messrs. Henry Gritten & Son, Westminster, S.W. :—

W. Seymour & Son	£1,120	W. Jeeves*	£1,062 14 6
F. Newton	1,097		

HITCHIN.—For alterations and additions to Wine Warehouse, "Bancroft," for Mrs. Robert Hood Baker. Mr. Walter Graves, architect, Winchester House, London, E.C. :—

F. Newton* ... £228 0 0

ILFORD.—For widening Loxford Bridge, Ilford-lane, for the Urban District Council. Mr. H. Shaw, Surveyor to the Council, Town Hall, Ilford :—

D. T. Jackson, 104, Ripple-road Barking, Essex* ... £748 16 10

KILMARNOCK.—For permanent way construction, excavation, concrete foundations, etc. (Contract No. 10, Electric Light and Power Supply), for the Corporation. Messrs. Kennedy & Jenkin, engineers, 17, Victoria-street, Westminster, S.W. :—

D. Kerr & Co., Ltd., London* .. £22,784 6 6

LINCOLN.—For erecting public elementary school, Monk's-road, for the Lincoln Education Authority. Messrs. W. Watkins & Son, architects, Silver-street, Lincoln :—

F. Messom	£7,050	H. S. & W. Close	£6,555
S. & R. Horton	6,961	W. Wright & Son, Lincoln*	6,200
T. Cuthbert	6,700		
Mawer Bros.	6,632		

LONDON.—For the erection of casual wards, Waterloo-road, Victoria-park, N.E., for the Bethnal Green Board of Guardians. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C. Quantities by Mr. C. H. Goode, 22, Buckingham-street, Adelphi, W.C. :—

Wellerman Bros.	£7,163 0 0	H. Lovatt	£5,650 0 0
A. Porter	6,091 0 0	F. & T. Thorne	5,647 0 0
R. A. Lowe	5,989 0 0	S. E. Moss & Co.	5,600 0 0
F. G. Minter	5,987 0 0	J. Appleby & Sons	5,590 0 0
A. Reason	5,947 0 0	W. Lawrence & Co.	5,487 0 0
Whitehead & Co., Ltd.	5,892 0 0	H. Kent	5,420 0 0
F. & A. Willmott	5,798 0 0	J. Ferguson & Co.	5,397 18 7
C. Dearing & Son	5,782 0 0	Foster Bros.	5,231 0 0
Leslie & Co., Ltd.	5,697 0 0		

[Architect's estimate £5,491 5s.]

TENDERS—*Continued on page* 621.

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Extension of Mill, New Lane Mills, Laisterdyke	.....	T. Barker & Son, Engineers and Architects, 5, Bank-st., Bradford	June 6
Painting and Colouring Council Schools	Halifax Education Committee	J. Lord, C.E., Town Hall, Halifax	do.
Two Dwelling-h'ses, Houseley Hall-lane, Chapeltown	Messrs. J. & W. Kay	E. Hutchinson & Son, Surveyors, 18, Howard-street, Rotherham	do.
Milling Machinery	Warrington Property Purch. Com. ..	T. Longdin, Borough Engineer, Town Hall, Warrington	do.
Steel Sole-plates, Clips, etc.	Dublin & Blessington S. Tram. Co. ..	P. H. McCarthy, 32, Bachelor's-walk, Dublin	do.
Making-up Lyttleton-road, Stechford	Yardley R.D.C.	A. W. Smith, Eng. & Surv., Council Ho., Sparkhill, nr. Birm'ham	do.
Draining, etc., Parkfield-avenue, Rusholme	Manchester Paving, etc., Committee	Paving, etc., Department, Town Hall, Manchester	do.
Sewering, Paving, etc., Marwood-street	do.	do.	do.
Draining, etc., Brunt-street	do.	do.	do.
Draining, etc., Parkfield-street	do.	do.	do.
2,800 lin. yds. of Creosoted Morticed Fencing	Lancashire County Council	W. H. Schofield, County Surveyor, County Offices, Preston	do.
Painting, etc., at Workhouse, Thrapston	The Guardians	Master of Workhouse	do.
Hospital, Cloverhill, Ayr	Ayr District Committee	D. W. Shaw, 5, Wellington-square, Ayr	do.
*Laying and Maintaining Compressed Asphalte Paving	Portsmouth Town Council	The Clerk, Town Hall, Portsmouth	do.
Normanton Isolation Hospital, Featherstone	.....	W. H. Fearn ey, Architect, Station-lane, Featherstone, Yorks. ..	June 7
House, Surgery, etc., Wesley-road, Armley	Dr. J. Lamonby	C. F. Wilkinson, Architect, 35, Park-square, Leeds	do.
Repair of Roads	Croydon Borough Council	Borough-road Surveyor's Office, Town Hall, Croydon	do.
Repairing Roadway Girders, Victoria Bridge, Chelsea	The L.C.C.	Engineer's Department, County Hall, Spring-gardens, S.W.	do.
Repairing Carriageways, Victoria Bridge, Chelsea ..	do.	do.	do.
Sea Wall	Truro River Committee	M. Lea, City Surveyor, Truro	do.
Excavation and Removal of Bank	do.	do.	do.
Excavation from Bed of River	do.	do.	do.
Street-making, Part of John-street, etc., ...	Crewe Town Council	G. Eaton-Shore, Borough Surveyor, Crewe	do.
Farmhouse, Burthy-row, St. Enoder	Rt. Hon. Viscount Falmouth	Farmhouse, Burthy-row	do.
Stores	Bradford Cleansing, etc., Committee	Superintendent Call, Hammerton-street Depot	do.
Alterations, etc., Rehoboth Congre. Ch., Brynmawr	.....	Habershon & Fawckner, Architects, 41, High-street, Newport	do.
Street Works, Clive-ter. and Church-st., Ynysybwl..	Mountain Ash U.D.C.	W. G. Thomas, Surveyor to Council, Public Offices, Mountain Ash	do.
Broken Whinstone	Gosforth U.D.C.	C. J. Baff, Surveyor, Council-chambers, Gosforth	do.
Carting Work	do.	do.	do.
Pair of Houses at Cwmffrwdoer	Mr. A. Jeremiah	Mr. Jeremiah, Bridge End Inn, Cwmffrwdoer	do.
Five Dwelling-houses at Field Head, Kirkheaton ..	.....	J. Berry, Architect and Surveyor, 3, Market-place, Huddersfield	do.
Three Self-contained H'ses, etc., Stephen-st., Consett	Mr. W. Aynsley	T. H. Murray, Architect and Surveyor, Consett	do.
Mosaic Paving of Engine Room Floor	Wimbledon U.D.C.	Electricity Works Offices, Durnsford-road, Wimbledon	do.
District Fire Station, Odsal Top	Bradford Corporation	City Architect, Whitaker-buildings, Brewery-street, Bradford	June 8
Plumbing, etc., Temporary Hospital, Swinton Schools	Manchester Guardians	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester	do.
Painting Outside of Crumpsall Workhouse	do.	do.	do.
Superstructure of Temp. Hospital, Swinton Schools	do.	do.	do.
Primitive Methodist Church Schools, Abbeydale-road	Trustees of Carterknowle Prim. C'h.	Hall & Fenton, Architects, 14, St. James'-row, Sheffield	do.
Painting, etc., at Children's Homes, Rothwell Haigh	Hunslet Guardians	F. W. Mee, Clerk, Union Offices, Hunslet, Leeds	do.
Painting, etc., at Union Offices, Hunslet	do.	do.	do.
Stores	Middleton Corporation	E. E. J. Anderson, Gas Engineer, Middleton	do.
Enlargement of Water Filter Beds, Layland Green..	Ashton-in-Makerfield U.D.C.	T. Burgess, Waterworks' Engineer, Ashton-in-Makerfield	do.
Vicarage, Newry	Vicar, etc., St. Mary's, Newry	W. J. Watson, Architect, Benvenue, Rostrevor	do.
Road Works, Whitton-road	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham	do.
Agricultural Drain Pipes	Manchester Cleansing Committee ..	R. Williamson, Town Hall, Manchester	do.
Repairs to Labourers' Cottages in Duleek	Meath R.D.C.	T. Dowdall, Clerk, Board Room, Drogheda Workhouse	do.
New Road, etc., Gilfach Bargoed	Mr. A. C. Thomas	W. Harris, Architect and Surveyor, Gilfach Bargoed	do.
Materials	Raunds U.D.C.	T. Yorke, Engineer and Surveyor, Raunds, Northants	do.
Alter., etc., Caersalem Newydd Bap. Chap., Tirdennaw	.....	Chapel House, Tirdennaw, near Swansea	do.
Casual Working Cells, etc., Workhouse, New Romney	Romney Guardians	Master of the Workhouse	do.
*Erection, etc., of Wall	Kingston-on-Thames Corporation ..	Borough Surveyor, Kingston-on-Thames	do.
Painting, etc., Calverley Hospital, Thornbury	Joint Hospital Board	At the Hospital, Thornbury	June 9
Restoration, Muiryhall Croft Dwelling H'se, Urquhart	.....	G. R. M'Garva, Factor, Innes, Elgin	do.
Additions to Broomhill Farmsteading, Urquhart	.....	do.	do.
Additions to Hatton Farmsteading, Lhanbryd	.....	do.	do.
Pair of Semi-detached Villas at Heaton	.....	Walker & Collinson, Architects, Swan-arcade, Bradford	do.
Painting 4,500 lineal yds. of Iron Fencing, also Bridge	Hartwood Asylum	Clerk of Works at the Asylum, Hartwood, Lanark	do.
Stone-breaking Machine and Screening Plant	Gravesend Town Council	Borough Surveyor's Office, Town Hall, Gravesend	do.
Sewer, Ann-street, etc., Blairgowrie	Town Council	Burgh Surveyor's Office, George-street	do.
Sewerworks, Lower Hove, Plymstock	Plymton St. Mary R.D.C.	F. A. Clark, 83, Old Town-street, Plymouth	do.
Paving, etc., of Carriageways	Edinburgh City Council	Mr. Proudfoot, City Road Surveyor, City-chambers, Edinburgh..	do.
Granolithic Work on Footways	do.	do.	do.
Retort Bench	Renfrew Town Council	Engineer at the Gasworks	do.
Engines and Exhausters	do.	do.	do.
Condensers	do.	do.	do.
Purifiers	do.	do.	do.
Boiler	do.	do.	do.
Additional Rooms for Nurses at Cardiff Workhouse	The Guardians	E. Seward, F.R.I.B.A., Queen's-chambers, Cardiff	June 10
Electric Light Installation, Uphall Lighting District	Bathgate District Committee	A. Lindsay, Engineer, 11, Jamaica-street, Glasgow	do.
Superintendent's House, Royal Victoria Hos., Belfast	.....	S. P. Close, Architect, Donegall-square-buildings, Belfast	do.
Three Sliding Partitions at Schools	Plymouth Education Authority	E. Chandler Cook, Secretary, 18, Princess-square, Plymouth	do.
Gamekeeper's Cottage, Dykeside, Birnie	.....	J. Smith, Factor, Seafield Estates Office, Elgin	do.
Alterat'ns, etc., Wesleyan Methodist Chp, Teignmouth	The Trustees	T. Hambley, Bank-street, Teignmouth	do.
Making-up Streets	Rhondda U.D.C.	W. J. Jones, Engineer, Public Offices, Pentre, Rhondda	do.
Relaying Sewer at Tynybedw	do.	do.	do.
Granite	Halesworth U.D.C.	C. H. White, Clerk, Halesworth	do.
Alterations to Protestant Hall, Enniskillen	.....	T. Elliott, Architect, Darling-street, Enniskillen	do.
*New Coastguard Buildings at Leven, Fife	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
Repairs, etc., Hartley University Coll., Southampton	The Council	The College Office	June 11
Painting Externally Twelve Schools	Hull Education Committee	J. P. Riley, Education Offices, Albion-street, Hull	do.
Colouring and Whitewashing Thirteen Schools	do.	do.	do.
Condensing Plant	Portsmouth Town Council	A. Hellard, Town Clerk, Town Hall, Portsmouth	do.
Materials, Cornsay Colliery	.....	Ferens & Love, Market-place, Durham	do.
Cleaning and Painting Poulton-road Schools	Wallasey Education Committee	W. H. Travers, Dis. Engr., Public Offices, Egremount, Cheshire..	do.
Cleaning & Painting Riverside Schools, Desmesne-st.	do.	do.	do.
Wesleyan Chapel, Exelby, near Bedale	.....	T. Hogg, Exelby, Bedale	do.
904 tons of Broken Granite	Wakefield R.D.C.	F. Massie, A.M.Inst.C.E., Tetley House, Wakefield	do.
765 tons of Broken Whinstone	do.	do.	do.
3,675 tons of Broken Furnace Slag or Limestone	do.	do.	do.
370 tons of Broken Ballast	do.	do.	do.
Team Labour	do.	do.	do.
Painting, etc., Fingerposts, Milestones, Fencing, etc.	do.	do.	do.
Thirty-four Dining Benches at Workhouse	Plymouth Guardians	W. Adams, Clerk, 13, Princess-square, Plymouth	do.
Police Court at Merthyr Tydfil	Glamorgan County Council	W. E. R. Allen, Glamorgan County C'l. Offices, Westgate-st., Cardiff	do.
Painting, etc., Bethlehem Congregational Chap., Rhos	.....	54, Hall-street, Rhos	do.
Farmhouse and Pair of Cottages, Chisledon, Wilts ..	.....	W. Drew & Sons, Archs. and Survs., 28, Regent-circus, Swindon	do.
Stores	Edinburgh & District Tramways Co.	J. E. Pitcairn, 1, South Charlotte-street, Edinburgh	do.
Mission Hall, etc., Troedyrhiw	.....	The Church Vestry	June 12
Painting, Repairs, etc., Uplands Schools, Bexley Heath	The Managers	E. Box, Architect, Market-place, Bexley Heath	June 13
Stores	Direct'rs, Powell-Duffryn St. Coal Co.	Stores Manager, Aberaman Offices, near Aberdare	do.
Lancashire Boiler	Southampton Corporation	J. A. Crowther, Boro' Engineer, Municipal Offices, Southampton	do.
Painting Railings, Central Park, Ilford	Ilford U.D.C.	H. Shaw, Surveyor, Public Offices, Ilford, Essex	do.
Painting Pavilion and Bandstand	do.	do.	do.
Paving Ley-street, Ilford	do.	do.	do.
Rebuilding Fox and Hounds Inn, Bridestowe	Trustees of Hamlyn Estate	E. H. Harbottle & Son, Architects, County-chambers, Exeter	do.
Making-up Russell-road	Felixstowe and Walton U.D.C.	Office of the Surveyor, Town Hall, Felixstowe	do.
Granite, Wickham Market	Plomesgate R.D.C.	T. W. Read, Clerk, Board Room, Wickham Market	do.
Carting Road Material	do.	do.	do.
Four Dust Vans	Wimbledon U.D.C.	C. H. Cooper, Engr. & Surv., Council Offices, Broadway, Wimbledon	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be Delivered
Cranes, Granton Works	Edinburgh, etc., Gas Commissioners	W. R. Herring, M.Inst.C.E., New-street Works, Edinburgh	June 13
*Workmen's Cottages and Making-up Rowsley-avenue	Hendon U.D.C.	Council's Engineer, Council Offices, Hendon, N.W.	do.
Permanent Way for Tramways	Warrington Corporation	Preece & Cardew, 8, Queen Anne's-gate, Westminster	June 14
Broken Granite	Hertford Corporation	T. J. Sworder, Town Clerk, Hertford	do.
*Reconstruction of Bridges, etc.	Kent County Council	F. W. Ruck, County Architect, Maidstone	do.
*Reconstruction of Bridge, Dartford	do.	do.	do.
*Works of Street Improvement	Bromley Borough Council	Borough Engineer, Municipal Offices, Bromley, Kent	do.
Steel Lattice Girder Bridge over the Rye at Ness	Kirbymoorside R.D.C.	J. E. Parker, C.E., Post Office-chambers, Newcastle-on-Tyne	June 15
Deck Spans for New Baraker Bridge	East Indian Ry. Co.	C. W. Young, Nicholas-lane, London, E.C.	do.
Extensions to Offices, etc., Dudley	Electric Lighting & Tramways Com.	R. P. Wilson, Engineer, 66, Victoria-street, Westminster, S.W.	do.
Transept at Leannor Church, Pwllheli	.....	Harold Hughes, Diocesan Architect, Bangor	do.
*Making-up Road	Chiswick U.D.C.	Council's Surveyor, Town Hall, Chiswick	do.
Coastguard Station, Achill Head, co. Mayo	Board of Public Works	H. Williams, Secretary, Office of Public Works, Dublin	June 16
Road between Cleave and Higher Storridge, Diptford	Totnes R.D.C.	A. Tucker, Highway Surveyor, Hazard, Totnes	do.
Whinstone, Slag	Norton U.D.C.	W. Watson, Surveyor, Council-buildings, Norton, Malton	do.
*New Coastguard Detachment, Speeton, Yorkshire	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	June 17
*New Coastguard Buildings, Prawle Point, S. Devon	do.	do.	do.
Byre, Cumberland Lunatic Asylum	Asylum Committee	G. D. Oliver, F.R.I.B.A., County Architect, Carlisle	June 18
Granite	Yeardsley-cum-Whaley U.D.C.	S. Taylor, Solicitor, Buxton	do.
Painting, etc., Padfield Wesleyan Buildings	.....	W. Smith, 37, Port-street, Padfield, Glossop	do.
Sewage Pumps and Gas Engines	Kingswinford R.D.C.	W. Fiddian, F.S.I., Stourbridge	June 20
Thirty-two Miles of Pipe Sewers, etc.	do.	do.	do.
Engine Houses, Wordsley and Ashwood	do.	do.	do.
Twenty-eight Miles of Pipe Sewers	do.	do.	do.
Electric Light Plant, Parkside Asylum, Macclesfield	Committee of Visitors	Lacey, Sillar, & Leigh, 2, Queen Anne's-gate, Westminster, S.W.	do.
Electric Light Wiring and Fittings	do.	do.	do.
Electric Light Installation at Baths, Goulston-st., E.	Stepney Borough Council	M. W. Jameson, Borough Engineer, 15, Gt. Alie-st., Whitechapel, E.	do.
Painting Isolation Hospital, Thorne	The R.D.C.	J. Stanley, Surveyor, Thorne	do.
Church, Loughglynn, co. Roscommon	Very Rev. Canon White	D. W. Morris, 68, Harcourt-street, Dublin	do.
Tower, etc., Catholic Church, Mountmellic	Very Rev. J. J. Doyle	W. H. Byrne & Son, Architects, 20, Suffolk-street, Dublin	do.
Two 25-k.w. Steam Dynamos, etc.	Deptford Borough Council	F. H. Medhurst & Lloyd, Engineers, 13, Victoria-st., Westminster	June 21
Switchboard	do.	do.	do.
Low Level Sewer, Hancock-road, Bow, etc.	The L.C.C.	Engineer's Department, County Hall, Spring-gardens, S.W.	do.
Heating, etc., Apparatus, Mousehole-lane, Pavilion	Southampton Corporation	J. A. Crowther, Boro' Engineer, Municipal Offices, Southampton	do.
Westgate and Junction Roads	Dartford U.D.C.	Surveyor's Office, Dartford	do.
1,000 Tons of Broken Guernsey Granite	Great Yarmouth Town Council	J. W. Cockrill, Borough Engineer, Town Hall, Great Yarmouth	do.
1,500 Tons of Broken Basalt	do.	do.	do.
*Underground Public Convenience	Brentford U.D.C.	Council's Engineer, Clifden House, Brentford	do.
*Extension of Wholesale Produce Market	do.	do.	do.
*Making-up Street	Wanstead U.D.C.	Council's Surveyor, Council Offices, Wanstead, N.E.	June 22
*Enlargement of Schools	Wimbledon U.D.C.	The Clerk, Council Offices, Wimbledon, S.W.	June 23
Broken Granite	Loughborough Finance Committee	A. H. Walker, Borough Surveyor, Town Hall, Loughborough	June 24
*New Coastguard Buildings	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
C.I. Double-faced Sluice, Valves, and Hydrants	Nottingham Water Committee	S. Moore, Water Manager, St. Peter's Churchside, Nottingham	June 25
C.I. Main Pipes and Special Pipes	do.	do.	do.
Lead Piping and Ingots	do.	do.	do.
Gunmetal Taps and Ferrule Fittings	do.	do.	do.
Clay Cross Sewerage	Clay Cross U.D.C.	H. W. Taylor, Engineer, St. Nicholas-chambers, Newcastle-on-Tyne	June 27
*Enlargement of Parcel Office, Ipswich	Commissioners of H.M. Works	H.M. Office of Works, Storey's Gate, S.W.	June 28
Additions, etc., to School Buildings, Stoke-rd., Slough	.....	Lee & Farr, Architects, Slough	June 30
Chancel, St. Cuthbert's Church, Hebburn-on-Tyne	.....	Hedley School, Argyle-street, Hebburn	do.
*River Wall and Embanked Wharf, Belvedere-rd., S.E.	Borough of Lambeth	Henry Edwards, C.E., 346, Kennington-road, S.E.	do.
Slating Six Cottages	.....	Stainer Bros., Masons, Rothwell, Leeds	No date.
Making, etc., New Street, North-lane, Roundhay	.....	W. H. Lister, Architect, 5, Greek-street, Leeds	do.
Tunnelling under N.E. Railway, Stonefall	.....	R. Annakin, Contractor, 7, Dragon-avenue, Harrogate	do.
Alterations, etc., Kyle Union Poorhouse, Ayr	.....	W. Kerr, Architect, Ayr	do.
Additions to Kineholme, Otley	Mr. J. Hastings Duncan, M.P.	Messrs. Adkin & Hill, Architects, Prudential-buildings, Bradford	do.
Making of Holywood Golf Links	.....	J. S. Reade, Rialto, Holywood, co. Down	do.
200 yds. of Wood Fencing	.....	J. Brunton, New Cross-street, Hull	do.
Sunday School Buildings, West End, Hexham	United Methodist Free Church	T. E. Davidson, Architect, 32, Clayton-street West, Newc.-on-Tyne	do.
Altera., etc., Heating Appara., Arthur's Hill School	Newcastle-on-Tyne Educa. Commtt.	A. Goddard, Sec., Educa. Offices, Northumberland-rd., Newcastle	do.
Painting and Cementing of Steamships	.....	Box P 7, Newcastle "Chronicle" Office	do.
Clearing and Opening-up Craighead Quarry	.....	R. Stewart, 66, Hanover-street, Edinburgh	do.
Alterations, etc., to Spelsbury School, near Charlbury	.....	Tollit & Lee, Architects, 7, St. Aldate's-street, Oxford	do.
English C.M. Chapel at Ferndale	The Trustees	W. M. Lewis & Morgan, Architects, Market-square, Pontypridd	do.
Alterations, etc., Midland Inst. for Blind, Nott'ham	.....	H. W. P. Pine, Secretary	do.
*Erection of School Buildings	Walthamstow Education Committee	H. Prosser, Architect, Committee Offices, Walthamstow	do.
*Painting, etc., Military Hospital, Colchester	War Department	R.E. Office, Colchester	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Head of Engineering Department	Northern Polytechnic	275*l.*	June 8
*Teacher of Cookery	do.	110*l.*	do.
*Teacher of Architectural Drawing	do.	Not Stated	do.
*Teacher of Brickwork	do.	Not Stated	do.
*Drawing Office Assistant	Northampton Institute, E.C.	Not Stated	June 11
*Craftsmaster, Darenth Asylum	Metropolitan Asylums Board	200*l.*, etc.	June 13
*Clerk of Works	Portsmouth Drainage Committee	4*l.* 4*s.* per Week	June 16
*Clerk of Works	Ealing Corporation	Not Stated	No date.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, —. *Contracts*, iv. vi. viii. x. *Public Appointments*, xvi.

TENDERS.—*Continued from page* 619.

LONDON.—For the erection of chancel, lady chapel, organ chamber, and west porches at St. Peter's Church, Hornsey, N. Messrs. James Brooks, Son, & Godsell, architects, 35, Wellington-street, Strand, W.C. :—

H. Knight & Son ..	£4,896	Rudd & Son.....	£4,360
Collins & Godfrey ..	4,757	W. Parmenter* ..	4,348
T. Rider & Son	4,697	Bentley & Son‡ ..	4,162
J. J. Wise	4,482		

‡ Withdrawn.

LOUGHBOROUGH.—For erecting new union offices, Ashby-road, for the Guardians. Mr. W. T. Hampson, architect, Ashby-road, Loughborough :—

Builder: A. J. Wileman, Boyer-street, Loughborough*	£425	0	0
Plumber: J. Perkins, Leicester-road, Loughborough*	93	9	4
Joiner: Watson & Camm, Nottingham-road, Loughborough*	159	10	0
Painter: J. Warriner, 20, Cobden-street, Loughborough*	16	0	0

MANSFIELD.—For painting and cleaning Rosemary Schools, for the Education Committee. Messrs. Vallance & Westwick, architects, Mansfield :—

W. Thompson ..	£258 5 0	C. G. Greenwood	£168 3 11
C. Scott.....	243 6 0	J. Millott	108 8 8
J. Robinson & Son West Hill Drive*	168 0 0		

MERTHYR TYDFIL.—For rebuilding 103, High-street, Merthyr, for Messrs. J. Jones & Sons, drapers. Mr. Charles Morgan Davies, architect, etc., 112, High-street, Merthyr Tydfil :—

S. Hawkins	£1,010	J. Jenkins, Canal Wharf, Merthyr* ..	£889
J. Williams	963		

MERTHYR TYDFIL.—For rebuilding No. 104, High-street, for Mr. Bernasconi, fancy goods dealer. Mr. C. M. Davies, Architect, 112, High Street, Merthyr :—

J. Williams ..	£1,113 3 9	E. L. Sullivan Mardy House, Merthyr*	£905 0 0
J. Jenkins....	970 0 0		

MOUNTAIN ASH.—For erecting a chapel, High-street, for the Welsh Congregational Church. Mr. T. W. Millar, architect and surveyor, Mountain Ash :—
Jones Bros., Mountain Ash..... £2,500

NORWICH.—For provision of a Lancashire boiler, for the Norwich Isolation Hospital. Mr. A. E. Collins, City Engineer, Norwich :—

Smithdale & Son	£590 0 0	A. Dodman & Co.	£409 0 0
Mansfield, Owen, & Co.	515 0 0	Tomlinson & Milan.....	400 0 0
Cradley Boiler Co.	430 0 0	Low Moor Co., Ltd.	390 0 0
Davey, Paxman, & Co.	422 10 0	E. R. & F. Turner, Ltd.	379 0 0
Coltman & Sons	420 0 0	Galloways, Ltd..	370 0 0
E. Danks & Co.	415 0 0	D. Young, Witney, Oxfordshire*..	348 0 0
J. Thompson ..	410 0 0		

Seating and Setting of Boiler.

Mansfield, Owen, & Co.....	£110 0 0	A. S. Lincoln ..	£79 0 0
A. D. Boddy & Son	97 0 0	J. S. Smith	69 0 0
D. Young	95 0 0	Downing Bros., Victoria-street, Norwich*	65 10 0
W. J. Hannant..	88 0 0		

PARRACOMBE.—For erecting a house at Parracombe, near Barnstaple, for Mr. A. G. Buhl. Mr. J. C. Southcombe, architect and surveyor, Barnstaple Quantities by the architect :—
R. Goss & Sons, Combe Martin, R.S.O.* £1,019 15

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PENGAM.—For erecting thirty houses near Rhymney Railway Station, for Glan-y-nant Building Club. Mr. P. Vivian Jones, architect and surveyor, Hengoed :—

E. Edwards	£5,598 15 0	Paul & Sons	£5,280 0 0
Lewis & Evans	5,580 0 0	Matthews	5,250 0 0
Gibbon	5,550 0 0	L. Davies	5,190 0 0
Vodden & Lee	5,475 0 0	E. Hughes, Bargoed, via Cardiff*	5,145 0 0
Edwards & Hopkins	5,400 0 0		

REIGATE.—For street improvement works in Lyndale-road, for the Town Council. Mr. F. T. Clayton, C.E., Borough Surveyor, Municipal-buildings, Reigate :—

S. Kavanagh & Co.	£499 0 0	Streeters & Todhunter	£352 0 0
J. Jackson	450 0 0	G. S. Faulkner, Reigate*	345 0 0
E. Isles	399 0 3		

ROTHERHAM.—For erecting an isolation hospital, with boundary wall, drainage, roads, etc., Badsley Moor-lane, for the Borough Council. Mr. J. Platts, County Borough Architect, High-street, Rotherham. Quantities by Architect :—

W. Thornton & Son, Rotherham‡ £11,994

‡ Recommended for acceptance.

ROTHERHAM.—For paving, etc., Shaftesbury-street and Truro-place, for the Highway Committee. Mr. G. Jennings, Borough Surveyor, Rotherham. Quantities by Surveyor :—

Shaftesbury-street.

T. Green, Rotherham‡ £156 10 0

Truro-place.

T. Green, Rotherham* 185 8 0

‡ Recommended for acceptance.

SHEFFIELD.—For alterations and additions to Truant Industrial School, Hollow Meadow, for the Education Committee :—

Thomas Roper & Sons, Ashdell-road, Broomhill, Sheffield* .. £1,389 2 6

SITTINGBOURNE.—For the erection of new business premises in Station-street, Sittingbourne, and for drainage works, for the Sittingbourne Co-operative Society, Ltd. Mr. Ernest C. Pearcy, architect, 2, Crescent-street, Sittingbourne :—

Elmore & Sons	£1,038 0 0	R. High	£898 10 0
T. Monk	975 0 0	G. Bowes	863 0 0
L. Seager	956 0 0	H. J. Tidy, Sittingbourne*	835 10 0
H. Gardler	911 0 0		
E. Bishop	898 15 0		

SOUTHALL.—For erecting a Carnegie Library, for the Southall-Norwood Urban District Council. Mr. R. Brown, architect, Public Offices, Norwood :—

General Builders' Association Ltd.	£5,949 0 0	Ford & Walton	£4,935 0 0
W. Wallis	5,279 18 6	Whitehead	4,875 0 0
Brightman	5,217 0 0	Wisdom Bros.	4,862 0 0
T. Bendon	5,148 0 0	M. Coles	4,828 0 0
W. Mash	5,109 2 6	Drake & Son	4,769 0 0
E. Moss	5,000 0 0	A. & B. Hanson	4,749 0 0
Kearley	5,000 0 0	Galbraith Bros.	4,746 0 0
E. Chamberlain	4,995 0 0	J. Dickens	4,690 0 0
J. Dorey, Ltd.	4,988 0 0	G. Gibson	4,672 0 0
J. Renshaw	4,975 0 0	R. Gurr & Sons	4,600 0 0
		Ferguson & Co., Tottenham†	4,492 0 0

STANLEY.—For 600 yards of sanitary pipes, etc., Shield-row, for the Urban District Council. Mr. J. Routledge, Surveyor, Council Offices, Stanley :—

A. Errington	£349 13 6	W. B. Parker	£280 8 3
G. E. Christopher	346 7 0	J. Robson	264 19 [illegible]
Tough Bros.	340 7 0	A. Routledge	264 12 6
Ayton & Sons	330 11 3	Johnson & Strong, Stanley*	258 18 5
T. Gatis	303 14 0		
G. E. Simpson	296 8 9		

SOUTHAMPTON.—For erecting a wharf front, etc., at Woolston. Mr. E. Cooper Poole, A.M.Inst.C.E., 5, Portland-street, Southampton :—

Osmaw	£1,387	Douglas & Richards	£1,095
Playfair & Toole	1,380	Daysh, Southampton*	1,049
Grace	1,097		

SUNBURY-ON-THAMES.—For new Congregational Church at Sunbury-on-Thames. Messrs. H. F. Coales and H. R. Coales, architects, Sunbury. Quantities by architects :—

Knight & Sons	£1,398 10 0	R. T. Hughes & Co., Ltd.	£1,270 0 0
T. & S. Fisk	1,392 4 0	W. H. Gaze & Sons	1,239 0 0
Wheatley & Sons	1,375 0 0	W. Waite*	1,208 18 7
E. Chamberlain	1,350 0 0	E. Potterton‡	1,182 6 0
Lock Bros.	1,311 5 0		

‡ Withdrawn.

TWICKENHAM.—Accepted for the erection of three steam boilers, refuse-destructor plant, boiler settings, etc., for the Urban District Council. Mr. W. Fairley, engineer, 69, Victoria-street, Westminster, S.W. :—

Pumping Machinery.

Simpson & Co., Ltd., Grosvenor-road, S.W.* £6,800

Refuse Destructor.

Meldrum Bros., Timperly* £2,665

Flues and Boiler, Auxiliary Plant and Pipe Work.

Aiton & Co., Willesden* £1,459

Boilers.

Taylor & Son, Marsden* £1,360

WOODFORD GREEN.—For alterations and additions to building at corner of High-road and Manor-road, Woodford Green, to form Men's and Youths' Club, for Mr. J. R. Roberts. Mr. A. W. Hudson, architect and surveyor, 87, Finsbury-pavement, E.C. :—

T. Osborn & Sons	£1,986	C. S. Foster & Sons	£1,850
J. S. Hammond & Son	1,931	S. J. Scott	1,760
C. Vigor & Co.	1,888	F. J. Coxhead*	1,697

WOODFORD-GREEN.—For the erection of a new post office at Woodford-Green, Essex, for the Commissioners of H.M. Works and Public Buildings :—

S. Kind	£3,550 0 0	J. Shelbourne & Co.	£2,982 0 0
E. Stevenson & Sons	3,520 0 0	C. S. Foster & Son	2,975 0 0
G. J. Hosking	3,447 0 0	T. Osborne & Sons	2,974 0 0
General Builders, Ltd.	3,497 0 0	T. Bruty	2,930 0 0
B. E. Nightingal	3,181 0 0	F. & A. Willmott	2,938 0 0
Speechley & Smith	3,130 0 0	L. Whitehead & Co., Ltd.	2,930 0 0
E. Brown & Son	3,129 10 0	Rowley Bros.	2,900 0 0
E. D. Pearcy	3,050 0 0	A. W. Nash	2,898 0 0
C. Ansell	3,030 0 0	Foster Bros.	2,859 0 0
		P. Banyard	2,720 0 0

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The Builder.

VOL. LXXXVI.—No. 3201. JUNE 11, 1904.

ILLUSTRATIONS.

"A City Tower of Healing".....Designed by Professor Beresford Pite, F.R.I.B.A.
Interior, Hollington House, Berks .....Mr. A. C. Blomfield, F.R.I.B.A., Architect.
Reconstruction, Oxford-place Chapel, Leeds
Wesleyan School, Oxford-place, Leeds } .....Messrs. G. F. Danby and W. H. Thorp, F.R.I.B.A., Architects.
Greek Art and the Persian Order.....Illustrations by Mr. R. Phenè Spiers, F.R.I.B.A.

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Scaffolding.

CONSIDERING the great importance of scaffolding in building construction and kindred works, and the responsibilities that attach to those who make use of it, we are somewhat surprised that the subject has received so little attention from writers who have contributed so largely to the literature of building construction. While scaffolding is essentially of ephemeral character, it must be in every way well designed and securely built. Upon its design depend, to a considerable extent, convenience and economy in the erection of buildings of all kinds, and upon its security depend the safety and lives of workmen and others engaged in building operations. Moreover, recent legislation has imposed heavy responsibilities upon contractors who make use of scaffolding, for by the Workmen's Compensation Act, 1897, and the Factory and Workshop Act, 1901, such constructions are placed directly under the eye of the executive representatives of the law. Hence, much more attention is being devoted to the subject than was formerly the case, but unfortunately comparatively little technical information is available to the inquiring mind. This deficiency is now made good, at least in part, by the publication of a treatise by Mr. A. G. H. Thatcher,* a building surveyor who has had exceptional facilities for acquiring useful and trustworthy knowledge in this branch of constructive work.

To define the term "scaffolding" is an easy task if the only object be to instruct the uninitiated, but to formulate such a definition as will serve to indicate the uses of scaffolding, and at the same time to include all temporary supports legally considered to be scaffolds, appears to be found difficult. In Chapter I., Mr. Thatcher quotes definitions by several writers on building construction, none of which he considers to be entirely satisfactory in view of the wider meaning given to the term "scaffolding" by recent decisions under the Workmen's Compensation Act. We concur in this view, for all the definitions mentioned are too specific in stating the uses of scaffolding, and in describing the nature of the construction. The author proposes the following definition:—

> "A scaffold, as used in building, is a temporary arrangement of timbers combined and supported in various ways to enable workmen to proceed with their work, and where required, to afford facilities for the lifting and carrying of materials."

We have no wish to appear captious, but even this rendering cannot be accepted as a standard, for several reasons. In the first place, although timber is usually employed it need not necessarily be selected as the material of construction for the "temporary arrangement." Next, it is undesirable to use the plural number of the word "timber," for by recent decisions it has been established that a single plank, supported in any way, may constitute a scaffold within the meaning of the Act. Thus, it is neither necessary that "timbers" should be used nor that they should be "combined." Again, it is an undesirable limitation to say that the object of scaffolding is to enable workmen "to proceed with their work," and finally, the last phrase of the definition is needlessly narrow in scope.

We believe the following version would better express what the author desired to imply:—

> "A scaffold, as used in buildings and kindred work, is a temporary stand or stage of any material, consisting of one or two members, placed separately or in combination, supported in any way, and intended for the use of any workman or workmen employed on, in, or about a building, and, when required, to afford facilities for lifting, lowering, carrying, or otherwise dealing with materials, tools, and appliances used on, in, or about a building."

Thus we see that scaffolding is of two distinct types, one intended for enabling workmen to reach the required parts of a structure, and the other for handling materials and appliances. But it should be remarked that a combination of the two types is often adopted and found of much use in practice.

To a general description of these forms of scaffolding, Mr. Thatcher devotes the first chapter of the volume to which we now direct the attention of our readers. The "Northern System," once used only in Scotland and the North of England, is first dealt with, this kind of scaffolding including two divisions: (1) a derrick staging employed for the transport of material, and (2) platforms which bring the workmen within reach of their work.

The design of derrick stagings is usefully considered at some length, and drawings are reproduced showing general elevations of staging for derrick cranes, and details relating to the construction of shoring for the central standard, of the top platform, and indicating the method

* "Scaffolding: A Treatise on the Design and Erection of Scaffolds, Gantries, and Stagings." By A. G. H. Thatcher, Building Surveyor. London: B. T. Batsford, 1904.

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of fixing ladders from the ground to the platforms. Other diagrams illustrate the construction of staging mounted upon travelling bogies, so that it may be moved from point to point along a range of buildings without the necessity for dismantling the temporary structure, and a method of applying mechanical power at different points by the employment of travelling cranes upon the platform of a staging.

Turning next to the "South Country System," Mr. Thatcher first discusses scaffolds built of square timbers, such as gantries for travellers, travelling gantries, gantries which serve as a base for lighter forms of scaffolding, and stagings similar to gantries but carried more than one story high. He then takes up pole scaffolds, as used by bricklayers, and the self-contained type used by stone-masons. All these forms of scaffolding are adequately illustrated, and the chapter serves to convey a sufficiently clear idea of their design as well as of the general details of construction and erection. Chapter II. is devoted to scaffolds for special purposes, and although the examples given do not cover more than a few of the varieties of scaffolding which may be necessary for coping with the difficulties frequently encountered in practice, they fairly represent the special types of construction that are in regular use, and may serve to suggest other modifications to the ingenuity of the builder. Among the forms here discussed we may mention scaffolds for chimneys, towers, steeples, domes, and arches, swinging scaffolds for painters, and ladder scaffolds. Hanging scaffolds are about the most dangerous devices of the kind employed in building work, and we are sorry that the author has not devoted more attention to the improved types of such apparatus which have already been introduced for the greater convenience of employers and safety of workmen.

"Shoring and Underpinning," which form the subject of Chapter III., can scarcely be regarded as varieties of scaffolding, although work of the kind has often to be performed by the scaffolder for the support of his temporary structures as well as for the support of buildings. On the whole, therefore, the inclusion of some notes on these subjects is to be welcomed. The method in which flying and raking shores are employed is briefly described and illustrated, but the treatment is somewhat superficial, and might have been extended with advantage. The same remark applies still more to the short reference to underpinning, a most important branch of work which does not always receive the amount of attention which it deserves.

Passing over Chapter IV., occupied with notes upon "Timber" and its selection for scaffolding purposes, we come to an instructive series of plates containing diagrams which illustrate the various rope knots used both in the erection of scaffolds and for attaching materials to hoists. The explanations of these diagrams and the accompanying notes upon ropes and cords will be found of practical use to the student; but we fully endorse the remark of the author that "half an hour with an expert scaffolder, preferably an old sailor, will afford more instruction than hours spent in studying diagrams." Little or no comment is necessary in the case of Chapters VI. and VII., the former entitled "Scaffolding Accessories and their Use" and the latter "The Transport of Material." One is a useful catalogue of auxiliary appliances and the other a brief review of the various forms of hoisting appliances in common use, with some hints as to the most suitable methods of applying simple hoisting tackle.

Two short chapters of this book are occupied with the theoretical aspect of scaffold construction, but we are sorry to say that the discussion is anything but satisfying. It is elementary and incomplete, and unless supplemented by knowledge already at the disposal of the reader, or obtained by him from other sources, will not suffice for the complete and scientific design of temporary works of the kind described. There is little, if any, room for adverse criticism of what the author actually says, but as will be seen presently, he leaves his readers without aid towards the solution of various important problems. Chapter VIII. commences with the statement that a scaffold is in a stable condition when, under the forces that may act upon it, it remains in a state of equilibrium. Then we are told that one of the forces which tend to create a loss of equilibrium is "the force of gravity due to the weight of the scaffold and that of attendant loads." The language in which this proposition is stated is admirably calculated to mislead those unacquainted with applied mechanics, for in a properly designed structure the weight of the material used cannot disturb equilibrium. There may be projecting parts which would tend to overturn the scaffold unless these were properly taken into account, but no structure of the kind can be said to be completely designed unless it is properly balanced and supported. "Attendant loads," if non-axial, would certainly tend to overturn the structure, but the author omits to qualify the term by which he thus designates superimposed loads. It is true, however, that any misconception that might arise will probably be dissipated on the study of subsequent paragraphs, dealing with the position of the centre of gravity of a scaffolding as affected by a series of loads carried on different parts of the structure.

We are next told that the resultant of the various loads points to the centre of gravity of the entire mass, and that if the vertical line taken from the centre of gravity falls within the base, the scaffold is in equilibrium. This is quite correct, and, as the author adds later, no load of which the centre of gravity, considered separately, falls within the base of the scaffold will cause instability, the most it can do being to bring the centre of gravity of the entire mass nearly to—or, as he doubtless intended to say, vertically above—the boundary of the base, so that a comparatively light load acting from without may cause loss of equilibrium.

With regard to the influence of wind pressure on stability, the author takes it for granted that, as the wind occasionally exerts a pressure of over 50 lb. per square foot, the least pressure for which calculations should be made is 40 lb. per square foot. It may be remarked, however, that the provision recommended by the Board of Trade is 56 lb. per square foot, and that the dynamic effect of sudden gusts has to be considered as well as the static force due to steady wind pressure. Therefore, while it may be safe in most cases to take 40 lb. per square foot as a minimum, prudence suggests the higher limit. The final recommendation of the author to the scaffolder is that "whether the force he is dealing with arises from the wind, loads, or a combination of both, he must triangulate." This is very good advice, but the reader is not instructed in the art of "triangulation," and if this chapter were provided with a few worked examples, considerable assistance would be afforded to those who wish to learn how to apply the lessons there conveyed in general terms. Chapter IX. contains as much useful information on "The Strength of a Scaffold" as can be expected in the brief allowance of less than nine pages of letterpress, but the exposition unfortunately stops short just where the designer begins to feel the want of further explanation. The author discusses the resistance of timbers as beams, struts, and ties, and gives simple rules, together with useful constants for timber of different kinds; but he does not attempt to deal in any way with the design of scaffolding regarded as a framed structure, or to indicate the methods by which the various stresses may be determined and both strength and stiffness adequately ensured.

In the last technical chapter of this work there are some hints which should be found most useful to those who are intrusted with the work of erecting scaffolding so as to provide for the safety of workmen in directions that are not affected by the stability or the strength of the scaffold as an engineering structure. This chapter entitled "The Prevention of Accidents," includes a number of serviceable suggestions, which deserve to be carefully remembered by all who are responsible for the construction of scaffolds or for their after supervision.

Chapter XI., giving a summary of various enactments and by-laws affecting the erection of temporary stagings, and the responsibilities of those who erect them, forms a fitting conclusion to a really valuable little treatise. So far as its scope extends, the book is worthy of general commendation as a reliable guide on a branch of construction which, in the past, has been left too much in the hands of workmen, and correspondingly neglected by architects and others possessing the technical knowledge necessary to insure safety and economy, both of labour and of material.

HOUSING SCHEME, CHISWICK.—Major J. Stewart, an inspector of the Local Government Board, recently held an inquiry at Chiswick Town Hall concerning the application of the Chiswick District Council to borrow a loan of 10,000*l.* for erecting workmen's dwellings in Magnolia-road. The Clerk, Mr. E. F. Collins, said that of the 10,000*l.* applied for, 800*l.* was for the purchase of the land, 700*l.* for the construction of the road and sewer, and the remaining 8,500*l.* was the estimated cost of the buildings. The scheme was for the erection of thirty-four double tenements, each tenement to contain two bedrooms, a living-room, and a scullery. Among those present at the inquiry was Mr. J. Barclay, surveyor.

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THE INFLUENCE OF GREEK ART ON THE PERSIAN ORDER.

By Mr. R. Phené Spiers.

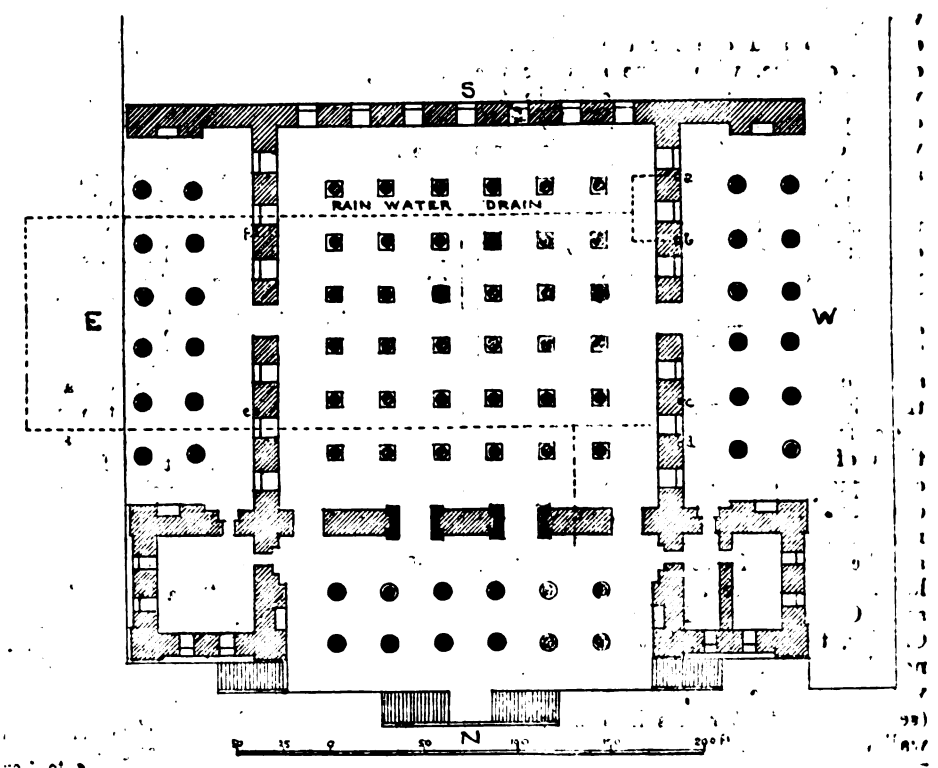
WHEN, in 1851, shortly after Layard's discoveries at Nimroud, Fergusson published his work on the Palaces at Nineveh and Persepolis, and later on reproduced in the Assyrian Court at the Crystal Palace his conjectural restoration of an Assyrian Palace, he copied therein the Persian order as developed in the Great Hall of Xerxes at Persepolis, his assumption being that Xerxes had copied in stone the columns and capitals which in the Assyrian Palaces had been in wood only, and had consequently perished either in course of time or in a conflagration. Layard's subsequent discoveries, followed by those of La Place at Khorsabad, have thrown additional light on the subject, which render Fergusson's theories extremely doubtful. Into this subject we do not propose to enter here, but the unfortunate selection of architectural details made by Fergusson from the palaces built by Xerxes in 485 B.C. on his return from his expedition through Greece and Asia Minor has led the student into the belief that the Greek Ionic order owes the origin of some of its principal features to an Assyrian source, and in his description of Greek Architecture Fergusson refers frequently to this subject.

The object of this essay is to show that, in his development of the Persian order, as found in the Palaces of Persepolis and Susa, Xerxes was indebted to Greek models and possibly to Greek artists, and this task has been rendered easier in late years by the discoveries of archaic Greek work, some of which is nearly two centuries earlier than the work in the Palaces referred to.

It is necessary first to point out that the early work of Cyrus and Darius (restricting our inquiry to the Persian order of columns only) bears no resemblance whatever to any remains found in Assyria, or suggested in the bas-reliefs which have been brought to Europe, or known by drawings made from other examples. If we are able to accept the clear description given by Polybius of the great Palace at Ecbatana, constructed probably by Cyaxares about 620 B.C., and enlarged and restored by the Achæmenian monarchs, it is to the Capital of the Median Monarchy that Persia owed the source of her inspiration. Polybius (X. 24) states that the columns of the stones and peristyles of the Palace at Ecbatana were in cedar and cypress, supporting beams and framed ceilings in the same material, all covered with silver plates, and that the roof was covered with silver tiles. The ephemeral nature of the one material and the intrinsic value of the other are sufficient to account for their entire disappearance, but of the restorations by Darius and Xerxes, who occupied Ecbatana as one of their capital cities, many remains have been found, and the stone columns, bases, and capitals are similar to those found at Persepolis and Susa. If the *stoas* and *peristyles* mentioned by Polybius were halls of columns and porticoes, we are able not only to account for the origin of the Persian order, but for the plans of the palaces at Persepolis and Susa, the only change being that stone columns have been substituted for those which, in the palace built by Cyaxares, were in timber only, the entablature being still in wood, as evidenced by the wide intercolumniation of from 4½ to 5½ diameters.

The earliest Persian palace of which remains exist was that built by Cyrus the first King (560 B.C.) at Pasargadæ, where he defeated and took prisoner Astyages, the last Median monarch. Of this Persian palace there remains *in situ* only one column, unfluted, over 30 ft. high, built in three drums, with a plain circular base, and three stone antæ, 21 ft. high, on the upper portion of which are the sinkings in which the timber architraves were housed. The foundation bases of other columns have been found and portions of the foundations of walls, which showed that the Palace consisted of a central Hall of columns and, at least one portico. The design was evidently of the simplest kind, showing that in its origin the Persian order had none of the elaboration found in the work of Xerxes. The same may be said of the Palace built by Darius at Persepolis in 521 B.C. No columns were found there, but the foundation bases of all those in the central hall and entrance portico were still *in situ*. Only one stone anta remains, in the upper portion of which are the sinkings for the housing of the entablature. In Fig. 1 (see plate) the section represents the actual sinking in the stone, and, taken in conjunction with the tomb of Darius at Istakr, close to Persepolis, is of great value, as it enables us to make a conjectural restoration, at all events, of a portion of the entrance portico, Fig. 2, which would seem to have been copied in the tomb, and was of the same dimensions in width and height. Here we find the oldest example remaining of the Persian capital, which consisted of two bull's heads and half-bodies, forming a bracket capital to support the architrave, and carrying on their backs *a corbel which projected in front of the column so as to carry a projecting architrave*, Fig. 1. Such a feature actually exists in the tomb façade and the sinking in the anta proves its existence in the portico of the Palace. In order to balance the weight, we have suggested a similar feature at the back, so that the Persian capital was a quadruple bracket capital, which neither Coste, Dieulafoy nor Perrot and Chipiez seem able to realise. In the tomb the columns carved are only semi-attached, so that the bracket in the rear does not occur. The columns carved in the tomb are unfluted, and their bases consisted of a plain torus moulding on a square die. The front view of the bull-headed capital is shown in Fig. 5. The only other early example of a base is that found by M. Dieulafoy at Susa, with the name of Darius inscribed on it (Fig. 4). This base is known as the campaniform base, and its origin, as also that of the bracket capital, is suggested in Fig. 3, which represents a portion of a projecting porch or shed in front of a peasant's house, as found down to the present day. The oblong block had for its object a better support for the architrave beam than that given by the post alone, and to preserve from damp the lower portion of the post, it is usually raised on a base consisting of rubble stones coated with mud. As both these features, viz., the bracket capital and the campaniform base, are peculiar to the Persian order, and are not found in any other known style, we are inclined to assign to them a Median origin.

The intercolumniation of the columns carved on the tomb of Darius is 4½ diameters (5½ centre to centre) and the relative proportion of height is 10½ diameters, which suggests that the superstructure was in wood, and, as shown in the tomb of Darius and in the anta of his



Plan of Great Hall of Xerxes, Persepolis.

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palace, consisted of squared beams projecting slightly one in front of the other. Beyond that, as all the timber work has perished, we have no further evidence, and our description of the development of the order under Xerxes is confined to the columns.

Before entering into this question a few words on the Great Hall of Columns built by that monarch at Persepolis, may not be out of place, especially as there exist some wide divergencies of opinion with respect to its conjectural restoration. If we have ventured to dispute the correctness of Fergusson's theories respecting the restoration of an Assyrian palace, there is no doubt that in his conception of the plan of the Hall of Xerxes, as set forth in his work already referred to, he followed the only interpretation possible, and his statement "that some restorations he had seen were too absurd even to merit exposure" has been borne out by later discoveries. Fergusson contended that (A) the Central Hall of Columns was inclosed with a wall (see plan in wood-cut); (B) the stone pedestals (shown in black on plan) were the plinths of entrance doorways in this inclosure wall; (C) there were anta to all the three porticoes; and (D) the angles of the main front were occupied by square halls containing wood staircases leading probably to the roof.

Fergusson's theory was based on the existing plans of other palaces at Persepolis and on that at Susa. These palaces being, first, the Palace of Darius, already referred to; second, a palace inscribed with the name of Xerxes; third, the Palace of the Hundred Columns; and, fourth, the Palace at Susa. In the first two named there still remain the stone foundations of the square chambers or halls at the angles, and in all these cases the central hall of columns was surrounded by a wall. In the Palace of Darius, in addition to the features already named, there exist at the back of the portico the great doorway leading to the central hall and two windows on each side. These features were all in great blocks of stone; one for each jamb and one for the lintel and carved cornice, with stone sills for the windows; similar features exist in the other palaces at Persepolis. The walls which connected these isolated features are gone, and from the projecting stone bossing in their sides it is conjectured that they were built either in unburnt bricks or in rubble masonry laid in clay mortar, which was bonded with the projecting bosses,* and that in course of time this ephemeral construction has disappeared. This is the case with all the other palaces and the stone foundations only on which these burnt bricks rested are found.

Coming now to the conjectural restorations of the Great Hall of Xerxes. In consequence of the immense size of its doorways they were built in coursed masonry, and all that remains of them are the plinths of two of them about 4 ft. high. These were assumed by Flandin and Coste, followed by Perrot and Chipiez, to be altars, but it should be noted that on three sides only were they worked to a fine face; on the fourth side (see plan) is that recess into which the wall was bonded.

* In nearly every other case instead of the projecting bosses there are sinkings or recesses into which the brickwork was bonded.

On the platform of the Great Hall Flandin and Coste found a number of vertical stone drains, which they assumed were intended to drain the surface of the platform, and they indicated on their plan the connexion of these, one with the other, by a horizontal drain running under what would have been the site of the east and west inclosure walls of the great wall.* Further, they stated that on the south side of the southern row of columns of the great hall and in the angles of the north front the natural rock existed everywhere and bore no trace of having carried a wall. Based on these assumptions, Flandin and Coste, followed by Perrot and Chipiez, contended that, firstly, there could have been no inclosure wall to the central hall, as no one would erect a wall of crude brick on a site below which ran a great drain; and, secondly, there was no evidence of a superstructure on the natural rock of the south side. They assumed the doorway plinths in the north inclosure wall to be altars, and put forward a conjectural restoration of the Great Hall consisting of four groups of columns only; a centre group of thirty-six columns in six rows of six each, and north, east, and west groups of twelve columns each, arranged in two rows of six each, all of these groups standing isolated one from the other on the raised platform of the Great Hall.

In 1891 Mr. Weld Blundell went out on a mission at the instance of, and partly at the cost of Lord Savile and Mr. Cecil Smith to take casts of some of the sculptured bas-reliefs at Persepolis, and the author of this essay furnished him with a plan of the site and directed his attention to some of the points at issue. Mr. Weld Blundell ascertained, firstly, that of the vertical stone drains, the remains of one of them (*a* on plan) rose 15 in. above the pavement of the hall and must, therefore, have been carried up in the wall to drain the roof; secondly, that these drains† were not at their feet connected one with the other, but that each one at its foot was diverted into other drains running between the first and second row of columns (see plan); thirdly, that the natural rock as it appeared to Flandin and Coste on the south side of the hall and on each side of the main front, was one which had been formed in the course of time by nature; the fine clay moistened by rain had been baked by the blazing sun to the apparent consistency of the natural rock, and was as fine and smooth as that which existed elsewhere. Mr. Weld Blundell broke through this crust, and on the south side of the hall found about six inches below this crust the foundations of a wall 11 ft. 8 in. thick running the whole length of the south front, and at the angles of the north front he found the foundations of the corner chambers with an accumulation of charred wood which he concluded had fallen from the floors and roofs of these halls. Messrs. Perrot and Chipiez's work on "La Perse" were published before 1891, and they were therefore not aware of these discoveries, which throw an entirely new light on the actual plan of the Great Hall, though Fergusson contended from the first that Coste must have been mistaken in his conjectures and in the plan he showed of the drains. These subterranean drains were entered by Mr. Weld Blundell; they were partly cut in the solid rock and partly hewn out of immense blocks of stone; they measured from 2 ft. 3 in. to 2 ft. 8 in. wide, and in some parts were 8 to 10 ft. high. They crossed the palace in two lines, and were connected with other drains leading to the outside of the great acropolis platform. The vertical stone conduits were cut in solid blocks of stone, the apertures of the gullies being 1 ft. 3 in. square.

The principal development in the Persian column as set forth in the palaces built by Xerxes at Persepolis and Susa was in the variety of design given to the campaniform basis, the fluting of all the columns and the additional decorative features of the upper part of the shaft under the bracket-capitals, not found in any earlier examples. In these we seem to recognise a new influence, which we attribute to the result of his expedition through Greece and Asia Minor; to the art treasures which he took back with him, and possibly to the Greek artists whom he is said to have brought over from Miletus and Eretria. The execution of the carving is so much more refined than that which exists in earlier examples that we are inclined to the belief it was carried out by Greek artists;* they must, however, have worked under the direction of Xerxes or his art director, otherwise it is difficult to understand the strange jumble of various decorative forms which are employed in the carving of the upper part of the shafts under the bracket-capital (Figs. 5, 6, 7, and 8.) If we assume that the first essay was made in his Great Hall at Persepolis, the result would seem to have been quite satisfactory to him and to his successors, as it was employed in all palaces subsequently built in Persepolis, Susa, Istakr, and Ecbatana without any material change in design. The columns of the East and West Porticoes of the Great Palace were not decorated in this way, and the only difference shown there is in the substitution of lion's heads and half bodies in the bracket-capital of the East Portico. These columns are nearly 13 diameters high, and, with the forty-eight flutes to their shafts from top to bottom, which seems to increase their height, have an extremely attenuated appearance (woodcut 2). Moreover the junction of the shaft with the bracket-capital is ungainly, so that it is quite possible this may have called for the further enrichments which were subsequently given to all columns whatever their dimensions might be. The columns at Istakr, 25 ft. high, are only smaller copies of the great columns at Persepolis, which are 68 ft. 9 in. high. The enrichments are three in number, separated one from the other by the bead and reel string, a favourite Greek ornament found in nearly all

* Fergusson in his work already referred to, p. 147, says "these gentlemen" (Flandin and Coste) "make the drains proceed from one to the other; and though it may appear impertinent in one who has never been there to say so to those who have, my own impression is that this junction does not exist." As will be seen later on, Fergusson's statement was correct.

† Mr. Blundell found six gullies, marked *a* to *f* on plan; he described *a* and *b*, and traced their connexion with the others shown. The other vertical drains were filled up with silt.

* According to Mr. Cecil Smith, the mason's marks on the upper surfaces of the bases (now exposed) of the Hall of the Hundred Columns are characters from the Greek alphabet.

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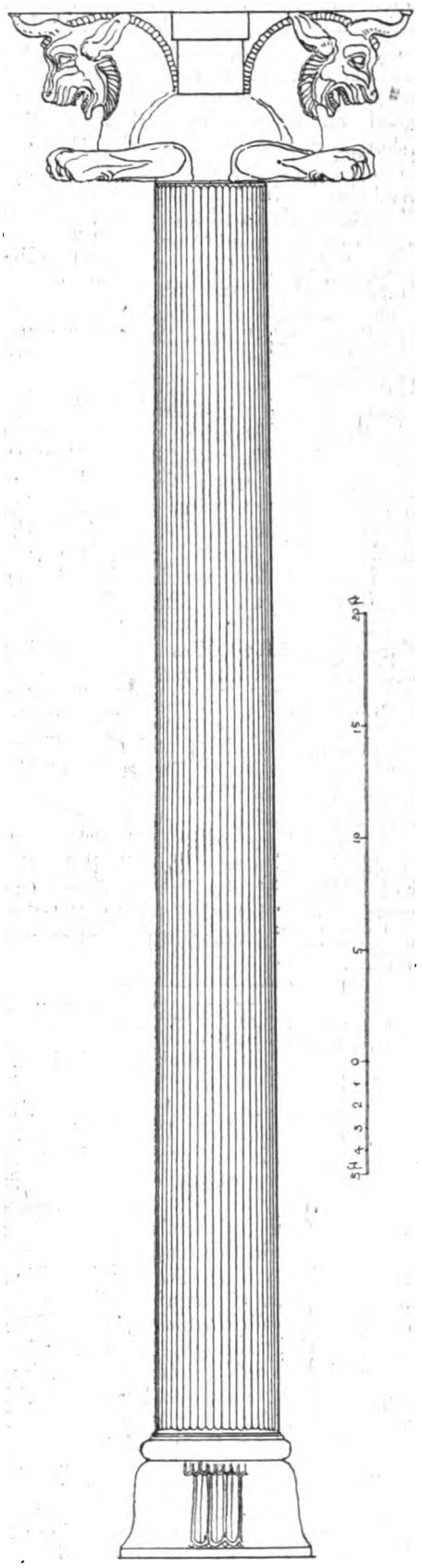
archaic Ionic capitals, the earliest known existing example being those at Ephesus (Figs. 18 and 20) and Naukratis (Fig. 21), both B.C. 560. The upper enrichment (Fig. 5) consists of four Ionic volutes placed vertically with supplemental volutes at the top and bottom. They mask to some extent the junction with the bracket-capital. If Xerxes took back with him some of the archaic capitals from the Temple of Miletus, which he destroyed, they may have suggested the feature. In these early Ionic capitals the abacus is generally twice as wide as its depth; they are in fact bracket-capitals, but the Persians already possessed their own type, which they preferred, so they utilised the feature in another way. Fig. 7 shows the half plan and Fig. 5 the decoration of what was the under surface of a Greek volute-block with the fillets of the cushion carried down vertically. The extra volutes may have been suggested by some Assyrian capitals, or were added to increase the height of the feature.

The middle enrichment at first sight resembles the well-known Egyptian palm tree capital, except that the leaves of the same are always indicated in the Egyptian example by incised lines each side of the stem; here under each lobe is a bud, which may be that of the papyrus plant, so that they represent the flower of same, and may have been copied from an Egyptian ivory brought from Egypt by Cambyses, just as the windows with balconies supported by shaft balusters shown in Assyrian bas-reliefs were copied from the ivories found at Nimroud by Layard and now in the British Museum. The lowest enrichment reproduces the pendant petals of a flower, of which the complete form is shown in a capital found at Delphi by Professor Cockerell (not probably of very early date, but indicating the original *motif* from which the egg and tongue decoration in the Ionic volute was derived). The earliest existing example is that found at Naukratis, now in the British Museum (Fig. 14). In the capital of the Votive Column at Delphi (Fig. 15) the divisions between the petals are merged into the fluting of the shaft. In the Athens capital (Fig. 16) the petals are painted only. In the terra-cotta capital from Gela (Fig. 17) the petals are almost as long proportionately as those in the Persian capital. The examples from the archaic temple at Ephesus (Figs. 18, 19, and 20) still suggest the origin of the egg and tongue (the upper part is at back), and one of the capitals (Fig. 20) has its volutes decorated with a flower similar to that found in the capital from Susa (Fig. 9).

Coming now to the shaft, the earliest examples of fluting are those found in the works of Xerxes. The number of flutes varies according to the size of the column; at Istakr, already referred to, there are only thirty flutes. The number in the other palaces at Persepolis varies from forty to fifty-two. The flutes in the early Greek examples vary in number; in the earliest examples at Ephesus, 560 B.C., there are fifty-two. There are no fillets in the Persian examples, as shown in Texier, but Dieulafoy's photogravure shows that some of the edges have worn away, which may have led Texier to the belief that he recognised fillets. To direct Greek influence therefore we may attribute the Persian fluting of the shafts.

If in the capital and enrichments below the same no change would seem to have been made, the bases show considerable



Column, Hall of Xerxes, Persepolis (Capital of East Portico: Base of West Portico).

variety, of which in Figs. 10, 11, and 12, we give some of the more characteristic examples, and these compared with various selections from Greek work suggest the source from which some of the designs may have been derived. We have already referred to the pendant petals; there is another peculiar form to which the French give the name of *rais de cœur*, shown in the cornice of the archaic stem from Ephesus (Fig. 22) and in the capitals from Ægæ (Fig. 23) and Neandria (Fig. 24), which are embodied in Fig. 11. Fig. 12 would seem to be based on an Egyptian design as regards its upper portion, in which the globe between papyrus or lotus buds is carved.

When compared with the primitive base of Darius (Fig. 4), the various combinations of design and their similarity to well-known decorative features throughout Ionia, some of which predate the work by Xerxes by nearly two centuries, constitute a strong argument in favour of the influence of Greek art upon that in Persia.

In conclusion we would express the hope that in course of time it may be possible to find a room in the British Museum where casts of the more remarkable examples of Persian work may be exhibited. Their connection with Greek art is much closer than that which can be traced in the examples of Indian architecture which encumber the staircase in the British Museum and which might with greater advantage have been left with the Indian collection at South Kensington.

NOTES.

The Institute Council Election.

THE voting for the election of the Council of the Institute has, there is every reason to believe, been carried on by many members with a view to keeping out those who are opposed to the movement in favour of registration. The result is that Mr. G. F. Bodley, Mr. J. J. Burnet, Mr. Mountford, Professor Pite, Mr. G. H. Fellowes Prynne, and Mr. Paul Waterhouse, some of the very best names in the list put up for election, are turned out. This, we suppose, is by way of raising the standard of the Profession and of the Institute.

A Modern Telephone Exchange.

WE had an opportunity this week of inspecting the new exchange of the National Telephone Company in the Birkbeck Building, Holborn. In accordance with the best modern practice, the central battery system has been adopted. The thousands of small hand generators and batteries have been replaced by a battery of accumulators and a motor-generator at the exchange. The voltage used is only 24, so there will be no fear of shocks. In the operating-room the system of visual signalling is exclusively used. The candle-power of the lamps, which are covered by an opal glass cap of the size of a threepenny bit, is very low, so that there is no strain on the eyes the girl operators, but they are sufficiently bright to give a very conspicuous signal. When a subscriber takes his telephone off the rest his lamp signal on the exchange switchboard glows, and on learning the desired number the operator inserts a plug, technically called a "jack," into the proper switch, and this automatically extinguishes both the miniature lamp and a pilot-lamp over the switchboard, which notifies the supervisor should a call

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remain unanswered. When the subscribers replace their telephones in the rests, both miniature lamps light up, and this is the signal for the operator to remove the jack. Provision has been made to prevent accidents due to telephone circuits getting into contact with lighting systems or the trolley wires used in electric traction. Fuses have been inserted in the catch of a spring. The moment the telephone wire makes contact with a "live" wire the fuse melts, cutting out the telephone wire and ringing a bell. A simple but effective form of lightning protector has also been adopted. The system adopted of testing for faults by means of banks of lamps suitably arranged enables them to be located immediately. We understand that the National Telephone Company are gradually adapting all their fifty-seven London exchanges to the central battery system. We were favourably impressed with the care taken by the Company for the comfort and the equitable treatment of the 100 operators in this exchange. Everything is done to secure equal distribution of labour. An indicator in the operating-room registers the number of calls every operator receives. This is examined every thirty minutes, and if one operator is found to be too busy a number of her calls are connected to a less busy operator. Suitable reading and dining rooms are provided for the employees.

Holy Trinity Church, Gough-square, E.C.

THE BISHOP OF LONDON will shortly appoint a commission, under the provisions of the Union of Benefices Act, 1860, to inquire into the expediency of uniting the vicarages of St. Bride, Fleet-street, with Bridewell, and Holy Trinity, Gough-square. The latter church then, it seems, is marked for demolition. It was erected in 1837-8 after plans and designs by John Shaw the younger, as a district church, to contain 1,100 seats, in the parish of St. Bride. The structure stands upon a triangular site given by the Goldsmiths' Company, who own a considerable amount of property in that locality, at the junction of Pemberton-row and Great New-street, to the west of Gough-square, Fleet-street. The plan is that of a hexagon, 47½ ft. in diameter, with two octagonal recesses on the north-east and south-east sides for pews, and a larger similar recess which forms the chancel. The interior was almost wholly surrounded by two galleries carried upon iron columns. The glass in the three chancel windows is by Willement. Sir Arthur Blomfield rearranged the interior in 1873, and it was redecorated three years afterwards. The church, which is faced with yellow brick, is designed after the Norman style, or what was supposed to be so at the time. The architectural treatment is exceeding naïve, regarded from our present standpoint; but the plan, as a means of suiting the church to the outline of the site, has merit and originality. The building was erected by Howard and Nixon at a cost of 3,887*l.*

Dudley Gallery Art Society.

THE fortieth exhibition of water-colours organised by the Dudley Gallery Art Society is one of their best. Four works which stand quite apart are the four admirable views of ancient Roman remains and their surroundings by Signor Giampietri, especially the two of the "Temple of Saturn" (Nos. 42 and 283). These drawings stand out from everything else for power and force of effect, and represent the perfection of what can be done with water-colour in this class of subject. The effect of clear and bright sunlight conveyed in them, and the truth of the tones of the ancient masonry, are alike admirable. A very good bit of architectural illustration (though not to compare with these) is Mrs. Moon's "Porch of St. Denis, Amboise" (76). Among other works Mr. Duassut's small and highly finished scenes of foliage and flowers—"Spring" (22), "Phlox" (29), an "Old-World Garden" (110), and others, all show a high standard of conscientious work. Mr. Stormont's "Sand Dunes" (74), Mr. Coleridge's "Bellagio" (64), and Mr. G. Marks's "Landscape, Shropshire," are among the best of the smaller landscapes. Mr. Sylvester Stannard's works, one of which, "The Way to the Farm" (214), is on a rather large scale, are all clever but spoiled more or less by a pervading mannerism. Mr. A. Stevens's "On the Rocks at Cap Martin" (116) is a very good study of foreground; Mrs. Evelyn Heathcote has an admirable sketch (it is nothing more) of a "Stream in the New Forest" (132); Miss Gilchrist has achieved a good free treatment of sea in "A Stormy Tide" (142); Mr. Burleigh Bruhl's "At Walberswick" (169) is another good sketch; and Mr. Wilkinson's two studies of Drummers of the Royal Fusiliers (129, 186) are good. Mr. Forbes Witherby, who exhibits a sketch of "Rome at Dusk" (109) which is effective as a whole, spoils it by the bad outline of St. Peter's dome (we presume it is intended for St. Peter's), which is totally wrong in proportion and outline.

Whistler's Lithographs.

AT Mr. Dunthorne's Gallery in Vigo-street is a collection of lithographs by Whistler, most of which we fancy have been exhibited before in London. The little sketch of "The Model Reading," which is well known, is very pretty, and among the few sketches of single figures, rough as they mostly are, there are examples that show Whistler's facile though rather careless power in this kind of production. Of the majority of the lithographs, which include sketches of bits of buildings, etc., mostly of the slightest kind, it would be easy to find a score of people in London who could not only produce better lithograph sketches than these, but who would be ashamed, for their own credit, of exhibiting many of them. Nothing more pointedly illustrates the absurdity of the adulation of Whistler which is the mark of the up-to-date art-critic, than the fact that work of this kind should be made the subject of a special exhibition and talked of as if it were something wonderful.

The Dutch Gallery.

AT the Dutch Gallery in Brook-street Mr. Van Wisselingh has got together a small collection of oil paintings by French, English and Dutch painters. Among them are a charming little bright sketch by M. Fantin-Latour, "Ondine" (2), and a fine work by W. Maris, "Cattle Under the Willows" (19). Mr. Conder's two pictures of Brighton, especially the "Stormy Day" (5), have a great deal of individuality of style and treatment. There is something that reminds one of the figure-composition of Blake (on a larger scale) in Mr. C. H. Shannon's "The Bathers" (12), a picture in which there seems to be an attempt to put a certain degree of poetic sentiment other than the title would at first suggest. In his other picture, "The Toilet Scene" (13), the figure on the right seems out of proportion and remarkably long in the torso. There are other works of interest, and some which are rather curious than beautiful, in which category we should place the two by Monticelli, a painter who, as an artist once remarked to us, tried to paint pictures to look like carpets. This also (like the Whistler etchings) is a form of *caviare* to be swallowed by those who would be of the new orthodoxy in art. To our thinking it is merely a form of pictorial perversity.

Sketches in the Balearic Islands and Venice.

AT Messrs. Dickinson's Gallery in Bond-street is a collection of small water-colour sketches in the Balearic Isles and Venice, by Mr. Douglas Fox-Pitt, which, though slight, have the merit of showing a decided feeling for colour and atmosphere. "A Street in Palma" (20), "Mr. Eden's Garden, Venice" (22), "Venice" (23), an out-of-the-way corner, are all good examples of free rendering of light and colour. "The Windmills, Palma" (48) is a record of a curious bit of effect; and "Cloisters of S. Francisco, Palma" (42) a good sketch of an interesting bit of architecture.

THE EXHIBITION OF ANCIENT SIENESE ART AT SIENA.

I SHALL not attempt in the following notes to give an exhaustive description of this exhibition, nor to criticise it from the artistic point of view; but the importance of many of the objects exhibited, and the fact that until quite recently no official catalogue was to be had,* may serve as apology for the following short account of it, which may be of use especially to intending visitors, as an indication of what they may expect to find there. The exhibition is advertised to remain open until the end of August, but the time may eventually be extended.

The locale could not have been better chosen. The first and second floors of the splendid Palazzo Pubblico provide ample space, and the frescoes which decorate the walls of many of the rooms form a fitting background.

The objects which have been collected belong to a considerable extent (and this is especially the case in regard to the pictures) to the churches of Siena and its environs,† though some places at a greater distance—Orvieto, Grosseto, Massa Marittima—have added their contributions; and a good deal comes from private collections. In any case, it is an excellent opportunity of comparing works of art that have not been brought together before—though it would have been easy to arrange works by the same artist in juxtaposition to a greater extent than has actually been done—and of seeing under favourable conditions pictures that are often badly placed in the churches to which they belong.

The exhibition is divided into forty sections, each in a room to itself. The first of these

* At the time of my visit (May 17) it was expected to appear in a few days; but in the meanwhile only a short guide was available.

† The pictures from the Accademia and the Opera del Duomo have not been removed, though several of the treasures of the latter are on view here, including the sculptures of the Fonte Gaia and a few others.

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contains pictures, plans, drawings, and engravings which illustrate the topography of Siena from the XVIth century onwards. The second, which occupies the Sala della Pace, with the famous frescoes of Ambrogio Lorenzetti on its walls, contains the smaller specimens of goldsmiths' and silversmiths' work from the XIIIth century onwards, the greater part of it consisting of church plate, monstrances, crucifixes, etc. The third, in the Sala del Gran Consiglio, is a fine collection of embroideries from the XIVth century onwards, the great majority of which are ecclesiastical vestments from the various churches of Siena and the neighbourhood. Some fine *paliotti*, or altar fronts, are to be found in various other rooms.

The larger specimens of the goldsmith's art are housed there and in the chapel of the Palace (sections 4 and 5). They include a fine and very elaborate reliquary by Gabriello di Antonio di Lorenzo da Siena (1350-1411) from Lucignano, a fine XVth century head of a processional cross decorated with coloured enamel from the same place, the splendid reliquary which contains the head of S. Galgano from his church in Siena, two or three works by Francesco d'Antonio, including the box which serves to contain the arm of St. John the Baptist in the Cathedral, and the magnificent tabernacle by Ugolino di Vieri from the Cathedral of Orvieto.

The seventh room contains cases of illuminated MSS. from the XIIth century onwards, many of which come from the Biblioteca Comunale and the Archivio di Stato, including a XIIth century MS. of S. Augustine's *De Civitate Dei*, another of Pope Pius II.'s *Historia Bohemica*, the codex formed by the Libro dei Censi and Memoriale delle Offese of the Commune of Siena (the book of tributes and the register of "injuries suffered by the commonwealth at the hands of her neighbours"*). There are also many mass-books, four fine XVth century specimens being lent by the authorities of the Cathedral of Chiusi, and others by the Biblioteca Comunale and the Hospital of Siena. Those belonging to the Cathedral library have, on the other hand, been left there.

Room 8 contains a few more similar treasures —among them some books of the Hospital with painted covers, one of which shows the Cathedral as it was before the nave was lengthened—and, with room 9, a collection of statues in wood by Jacopo della Quercia and others, most of them painted or gilded.

Room 10, containing modern frescoes, has been left as it was; room 11 contains a few good specimens of mediæval ironwork, including a very fine hanging lamp; 12 has some good utensils—vases, bells, candlesticks, etc.—in metal, while sections 13 and 14 consist of a collection of arms and armour, and rooms 15 to 18 of casts of mediæval sculptures.

In the loggia on the second floor of the palace (section 19) the fragments of the original Fonte Gaia of Jacopo della Quercia have been re-erected (they were so much damaged that the fountain itself was reconstructed in 1868). The magnificent view forms perhaps an even greater attraction. From here we enter the ceramic collection (rooms 20-22), which has no treasures like the *maiolica* of Gubbio and Urbino to show, but contains fine sets of *vasi da farmacia*.

The rest of the exhibition is mainly devoted to paintings and drawings of the Sienese school, and will interest the visitor more or less in proportion to his admiration of its works, the merits and demerits of which have always formed a subject of considerable discussion. Though no new rival to, for instance, Duccio's famous "Maiestà" has come to light, it is a good representative collection, so that there is, at any rate, as has been said, an opportunity of confirming or correcting one's judgments upon the subject that should not be missed, as it will be difficult to have the chance again of seeing in the same gallery so many pictures from various places, many of which are not easily accessible.

A certain amount of unnecessary anachronism in the arrangement has occurred. Thus in room 23 we find No. 1,514 (a Pacchiarotto from S. Pietro e S. Paolo at Buonconvento) placed between two pictures by Bartolo di Fredi from the Municipio of Montalcino, which are a century earlier in date.

The collection of mediæval furniture—carved and inlaid work—(sections 6, 32) is surprisingly poor in quantity.

In conclusion, the exhibition, though one may have been led to expect a little too much, is distinctly worth seeing—if only as an excuse for revisiting a place so attractive as Siena. Any slight feelings of dissatisfaction will soon be dispelled by the sight of the Torre del Mangia rising into a glorious blue sky, or by a walk through the town which (though this has been said of many other cities of Italy) has perhaps the most of all preserved for us the feeling of the Middle Ages.

THOMAS ASHBY, JUN.

* Heywood and Olcott, *Guide to Siena*, 29n.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL general meeting of this Institute was held at the Rooms, No. 9, Conduit-street, W., on Monday evening, Mr. Aston Webb, R.A., the President, in the chair.

Alteration of By-law.

On the motion of the Chairman, it was agreed that the following words be added at the end of the first clause of By-law 3:—"After December 31, 1906, every person desiring to be admitted a Fellow shall be required to have passed the examination or examinations justifying him as an Associate, or shall be elected from the ranks of the Associates. But in special cases the Council by the votes of three-fourths of such members of the Council as are present and voting at a meeting of the Council, shall have power to dispense with such examination or examinations."

The fifteenth general meeting of the Session was afterwards held, when the minutes of the previous meeting were adopted.

The New Council.

A report was received from the scrutineers appointed to direct the election of the Council, Standing Committees, etc., for the year 1904-5. The following were elected members of the Council:—

As President: Mr. John Belcher, A.R.A. As Vice-Presidents: Messrs. T. E. Collcutt, A. Darbyshire, F.S.A. (Manchester), H. T. Hare, S. Perkins Pick (Leicester). As Honorary Secretary: Mr. Alex. Graham, F.S.A. As Members of Council: Messrs. W. H. Atkin Berry, A. C. Blomfield, M.A.Cantab., A. W. S. Cross, M.A.Cantab., F. R. Farrow, William Flockhart, Ernest George, J. S. Gibson, George Hubbard, F.S.A., C. E. Mallows, J. Douglass Mathews, S. B. Russell, W. Gillbee Scott, W. Howard Seth-Smith, J. W. Simpson, John Slater, B.A.Lond., Lewis Solomon, Butler Wilson (Leeds), and Ed. Woodthorpe, M.A.Oxon. As Associate Members of Council: Messrs. R. S. Balfour, W. H. Bidlake, M.A.Cantab. (Birmingham), H. V. Lanchester, Edmund Wimperis. Representatives of Allied Societies: Messrs. G. C. Ashlin, R.H.A., Royal Inst. of the Architects of Ireland; J. W. Beaumont, Manchester Society of Architects; A. W. Brewill, Nottingham Architectural Society; G. Bertram Bulmer, Leeds and Yorks Architectural Society; T. Cooper, Birmingham Architectural Association; H. Davis, York Architectural Society; H. L. Goddard, M.A.Oxon, Leicester and Leicestershire Society of Architects; John Keppie, Glasgow Institute of Architects; G. H. Oatley, Bristol Society of Architects. Representative of the Architectural Association (London): Mr. E. Guy Dawber.

Standing Committees.

The Standing Committees were elected as follows:—

Art Standing Committee.—Fellows: Messrs. J. Macvicar Anderson, W. D. Caröe, M.A., T. E. Collcutt, E. G. Dawber, Sir W. Emerson, Ernest George, J. S. Gibson, H. T. Hare, E. W. Mountford, and A. E. Street, M.A. As Associates: Messrs. R. S. Balfour, S. K. Greenslade, W. H. Romaine-Walker, Henry Tanner, jun., R. Watson, and E. Wimperis.

Literature Standing Committee.—Fellows: Messrs. John Bilson, F.S.A., A. W. S. Cross, M.A.Cantab., C. E. Mallows, W. A. Pite, Professor F. M. Simpson, R. Phenè Spiers, F.S.A., H. Stannus, H. H. Statham, C. Harrison Townsend, and P. Waterhouse, M.A.Oxon. Associates: Messrs. A. S. Flower, M.A.Oxon, F.S.A., C. H. Reilly, M.A., Professor R. E. Smith, P. L. Waterhouse, M.A., A. M. Watson, B.A., and P. S. Worthington, M.A.

Practice Standing Committee.—Fellows: Messrs. T. Batterbury, W. H. A. Berry, G. Hubbard, F.S.A., A. H. Kersey, J. Douglass Mathews, W. Hilton Nash, A. Saxon Snell, T. H. Watson, W. H. White, and E. Woodthorpe, M.A.Oxon. As Associates: Messrs. C. H. Brodie, Max Clarke, E. Greenop, H. H. Langston, T. E. Pryce, and A. W. Tanner.

Science Standing Committee.—Fellows: Messrs. T. Blashill, E. Flint, A. J. Gale, F. Hammond, F. Hooper, G. Hornblower, W. E. Riley, H. D. Searles-Wood, A. Saxon Snell, and Lewis Solomon. As Associates: Messrs. H. W. Burrows, Max Clarke, B. J. Dicksee, E. R. Hewitt, G. Pearson, and A. D. Watson.

The following gentlemen were then elected to the Institute:—

As Fellows: Messrs. Thomas Arnold (Edinburgh), Walter Albert Catlow (Leicester), Max Clarke (London), Allan Ovenden Collard (London), Wm. Henderson Duncan (Rochdale), Edward Goldie (London), Alfred Hy. Hart (London), Charles Grove Johnson (Mexico), Wm. Campbell Jones (London), Wm. Alfred Large (Ealing), Thos. Ed. Marshall (Harrogate), John Campbell Turner Murray (London), John Hy. Phillips (Cardiff), Alfred Roberts (Greenwich), Wm. Rushworth (Croydon), Percy Burnell Tubbs (London), John Collingwood Tully (Cape Town), Benjamin Woollard (London).

As Associates: Messrs. C. Rosenthall (Sydney, N.S.W.), and H. E. Hall (London).

Hon. Associates: Lord Stanley of Alderley and Mr. J. J. Shannon (London).

Hon. Fellow: Lord Curzon of Kedleston.

The Plenum System of Ventilation.

The meeting then discussed a paper by Mr. William Henman—"Notes on the Plenum System of Ventilation," which was taken as read, but of which the following is the text:—

"In the paper which I read last December* on the Royal Victoria Hospital, Belfast, I particularly stated it was not my desire to raise controversy on the subject of mechanical *versus* natural means for securing ventilation; yet, as members then present expressed the opinion that it might with advantage be further discussed, the Council of the Institute have appointed June 6 for that purpose. If the time then at our disposal is to be well employed, the subject of ventilation generally must be dealt with on practical and scientific lines; and as that was not attempted in the paper to which I have referred I venture to suggest some reasons which tend to show that plenum ventilation can be beneficially employed in certain buildings, and ought to be more closely studied by members of the architectural profession.

A primary necessity is to arrive at a concisely correct definition of what should be understood by the term "efficient ventilation" when applied to occupied buildings. Apart from outside contaminating influences which would affect ventilation by whatever means obtained, I suggest it is "continuous change of air within a building without causing discomfort or adversely affecting the health of the occupants."

The province of an architect in connexion therewith is to dispose buildings on the ground, construct and equip them, so that the available air may be supplied in ample quantities, freed from suspended impurities, tempered and regulated to requirements without deterioration.

Buildings are erected principally to secure greater comfort than can at all times be obtained in the open.

By the erection of buildings, movement of air within them is necessarily less than it would be over the unoccupied site.

Change of air within a building is principally brought about by an ascertainable force—either of propulsion or extraction—although the law of diffusion—*i.e.*, the process which brings about intimate mixture of gases without chemical combination—is a serviceable but less powerful agent in connexion with ventilation.

If these premises be accepted, the question which has to be discussed is not whether by plenum ventilation a condition within doors can be secured equal to the open air at its best, but whether it can be employed in certain buildings, suitably constructed, so as to obtain at reasonable cost more constant and efficient ventilation than can be secured by other means.

A great hindrance to the proper comprehension of this subject is the employment of unscientific terms, such as "artificial ventilation," "automatic ventilation," "natural ventilation," "mechanical ventilation," because they prejudice the mind. Ventilation is a result brought about either by natural or by mechanical force. Moved by either, air is the same, just as water is the same, whether allowed to flow naturally or forced on by mechanism. Water may become fouled on its way, so may air, whether it pass in naturally or is propelled

* See our issue for December 19, 1903.

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in its course from the outside to the inside of a building; but it does not in the least follow that fouling results from the power which caused its movement.

It is scientifically wrong to refer to a fire causing a "suctional" influence in a flue, for it does nothing of the kind.

Air when heated expands and is specifically lighter than an equal volume of colder air; it is the latter descending by the force of gravitation which propels the warmer air upwards; consequently an open fire in a room causes change of air by propulsion; moreover, the propelling force of wind is far greater than the suctional influence it exerts upon air within buildings. By realising these facts it is easy to understand that "plenum" ventilation is more in accord with nature's methods than "exhaust" ventilation.

Notwithstanding the acknowledged extravagance of, the dust and dirt resulting from, and the unpleasant draughts at times set up by, the open fire, I for one appreciate its cheerfulness, and believe it will long hold an honoured place in the British home. The mere fact that it necessitates an upcast flue is of the greatest service in connexion with ventilation; but as the area of an ordinary smoke flue at the chimney-pot end does not greatly exceed half a superficial foot, the volume of air which can pass through it in a given time is limited, as is also the heating power of a single fire-grate. Consequently, for larger apartments two or more fires are required, and it is well known that, unless an adequate supply of air be otherwise provided, smoke will at times be drawn down one or other of the flues. For this and other reasons hot water, steam, air heated by stoves or electricity, are used, none of which demand an upcast flue or flues from the apartment to be warmed thereby. Yet for the health and comfort of occupants change of air is a necessity, and can only be brought about by providing suitable inlets and outlets. This is a simple statement of fact of the utmost importance in connexion with ventilation, yet too often neglected, resulting, doubtless, from difficulty in determining the positions, dimensions, and construction of such openings, and I incline to the belief that strong advocates of what they term "natural ventilation" are of the *laissez faire* order who expect nature to do everything for them; and as they do not consider whence the wind cometh nor whither it goeth, they provide neither suitable entry nor exit for it in the construction of buildings.

With regard to the possibilities and difficulties of ventilating an apartment warmed by other means than open fires, say a church or assembly room. Suppose it is a calm, frosty day, with the temperature inside several degrees higher than it is outside. If inlet-openings are provided at or near the floor level and outlets at or near the ceiling level, a steady flow of air will take place from the inlets to the outlets proportionate to the difference between the internal and external temperature, and to the relative sizes and positions of the openings, brought about simply by the propelling force of the colder air outside falling by gravitation; but it does not follow that ventilation will be "efficient" even if the openings are adequate and well placed, because the differences in temperature may not suffice to cause adequate change of air—the opening of a door or window will upset the relative proportions between inlets and outlets, probably causing draughts. Moreover, with a number of people seated on the floor area, and with air entering around the lower portion of the walls, it can only arrive at those in the centre after becoming fouled by passing over the bodies of those nearer the inlets; but it is more than likely that the bulk of air passing through the room will travel from the inlets to the outlets without changing the air in the central portion. Every variation in temperature or in the force of wind outside will alter the conditions within, and during summer weather the temperature may be considerably higher outside than in; every factor is then reversed. Some improvement may be effected in cold weather by giving the incoming air an upward tendency and providing upcast flues as outlets with well-distributed openings near the floor level. The incoming air will then fill the upper portion of the room, gradually descend, change the atmosphere throughout, and pass away up the flues; but this arrangement of flues is not altogether satisfactory in summer weather, and even under such conditions change of air will fluctuate with every variation in the force of the wind outside. Consequently, with the best possible arrangements, so long as natural means alone are relied on, there must be constant, intelligent, and personal attention if comfortable ventilation is to be secured; nevertheless I am bound to confess that with care in the design and arrangement of suitable inlets and outlets, with adequate heating power, and with proper means for regulation, it is quite possible with personal attention to secure reasonable ventilation by natural means in buildings only occasionally occupied. None but very sensitive people are quickly affected by breathing a partially vitiated atmosphere, and few remain for long at a time in crowded places, so that when rooms are unoccupied windows and doors should be freely opened, and ample change of air secured. If this were regularly done, and thorough cleanliness were observed in and about buildings, there would be less cause for complaint of defective ventilation.

Every individual by respiration and exhalation throws off moisture and animal matter, and when a number of people congregate within an apartment the defilement of the atmosphere is considerable. Rapid change of air will carry much away, but with defective ventilation much is deposited upon exposed surfaces in the building in consequence of variation of temperature, and only prolonged and greater change of air than would be tolerated while a room is occupied will dissipate the contamination.

In the hope of disposing of the charge which has been made against me, that I am a prejudiced advocate of "plenum" ventilation, I now state most distinctly that unless it is continuously applied it is questionable whether it can be permanently successful, and I am not inclined to advocate its employment unless its advantages are considered worth the cost of continuous working. I cannot think it is sufficient to ventilate a building simply for the periods during which it is occupied, and then to stop the mechanism and bottle up the air until the next period of occupation.

Let me illustrate this by directing your attention to a railway carriage. Standing still, how stuffy it often is, particularly in hot weather; but when rapidly moving along it is freshened up. Yet, on again standing still, it loses its freshness. That is an example of ventilation produced by mechanical means intermittently employed.

Now I wish to explode another fallacy.

Downward ventilation has been termed "down draught," apparently in the hope of condemning it by giving it a bad name. Advocates of the open fire have stated that to propel air into the upper portion of a room and let it go out from the lower portion is unnatural. Fortunately this can be easily disproved. Take an ordinary room with an ordinary open fire and smoke flue. Test it as you will, and, apart from occasional strong winds setting up adverse currents, resulting at times in what are termed "smoky chimneys," it will be found that the only detectable outgoing of air takes place by the open fireplace flue, the lower opening of which is about 2 ft. 6 in. above the floor level. Many people open the upper portion of a window when the temperature of a room, heated by an open fire, is excessive, holding the idea that they are letting out the hot air; but with rare exceptions the temperature of the room is then actually lowered by letting in a larger volume of colder air, which compels a more rapid outgoing of heated air up the flue.

It is true that in most cases no special inlet for air is provided, and that in consequence air enters by any casual, and probably dirt-concealing holes, cracks, and crevices—mostly around the lower portion of the room—whence it makes its way in narrow streams, moving with considerable velocity towards the fireplace, causing unpleasant draughts, while little change of air takes place in the upper portion of the room. Yet, if the same room were provided with a suitable inlet at a foot or two below the ceiling, on the same side as the fireplace and as central thereto as may be, the incoming air would become tempered by contact with the ceiling, walls, furniture, etc.—previously warmed by radiant heat from the fire—it would, by its inflow, force the atmosphere of the room downwards towards the fireplace opening and up the flue to the open, without causing discomfort to occupants.* Under these conditions air is propelled into the room from a reasonable elevation, where it is generally fresher than near the ground level and more free from chance contamination. Force of wind outside, varying as it does in intensity, will materially affect velocity of change within. I have therefore devised a simple automatic regulating inlet, consisting of a curved enclosure to a resistless flap hung eccentrically so that the area of the inlet opening is diminished proportionately to the force of wind playing against it; but satisfactory results can be obtained even without this refinement if the inlet be provided with louvres for distributing the air at low velocity. I am perfectly aware it is not the method usually adopted, nor is it the one recommended in most works on ventilation. Do not, however, condemn it without proper trial; think it out, and you will, I believe, come to the conclusion, as by practical experience I have, that it is most effective in securing the efficient ventilation of an apartment; and if so, then the relative positions advocated for inlets and outlets with the "plenum" system are correct.

Complaints being so frequent of defective ventilation—even in buildings where outlay has been incurred in the expectation of securing, let us say, comfortable ventilation by natural means—is it surprising, when we consider the marvellous results of mechanical power, now used for the benefit of mankind in almost numberless ways, that attempts should be made to employ it for improving the ventilation of buildings?

Mining operations and many occupations have for years been carried on which would have been impossible without the assistance of ventilation brought about by mechanical means. Thousands of power-driven rotary fans and air-propellers are in daily use, proving the possibility of changing the air of enclosed spaces. Centuries ago the necessity for securing greater change of air within buildings than could at all times be naturally procured was recognised, and a few advanced minds suggested the employment of bellows and other primitive appliances worked by hand or water power. I have seen quaintly illustrated treatises on the subject; and although failure doubtless resulted from inadequate knowledge and appliances, there is no reason why, with air-propellers and power appliances brought to the high state of perfection they are to-day, we should not take advantage of them for securing ventilation within buildings.

It is no argument to say, "I don't like plenum ventilation," or even to point to failures which have occurred; nor is it sufficient to bring forward some fanciful idea that in an undefined manner air moved by mechanical power is deprived of an unknown vital essence. It has been suggested that by warming air otherwise than by the sun's rays this intangible essence is destroyed, and that is given as a reason why some people condemn plenum ventilation; but it is altogether begging the question, because in summertime, when "plenum" ventilation is so effective in maintaining a cooler atmosphere within doors than in the open, no heating is employed. Will it then be contended that, by lowering the temperature, such will-o'-the-wisp essence again disappears? Unfortunately my scientific knowledge is not sufficiently profound to enable me to determine if there is even an element of truth in these imaginings; but even if there be, which I strongly doubt, it is easy to demonstrate that with a carefully devised installation of "plenum" ventilation the necessary warming and cooling of air are effected with less chance of deterioration than by any other method. In addition to which the air is drawn from sources known to be at a distance from contamination; it can be cleansed from suspended impurities, brought to suitable hygrometric condition, and passed on to apartments without contact with impurity.

I am, perhaps, as painfully conscious as anyone that there have been many failures with "plenum," and so there have been with every other method employed for securing ventilation; but my experience convinces me that failure is not the fault of the system, but that it results either from want of knowledge and experience on the part of those who installed it, or from neglect. It is only by careful comparison of results and a minute examination of the means and methods employed that a true estimate of its value can be ascertained. Personally I have not the faintest doubt that by the "plenum" system the efficient ventilation of a building can be effected. The principle is perfectly sound; yet I realise there are two sets of objections to be met: the first I class as purely fanciful, most of which I have already dealt with; the second are more tangible, and relate to the means and appliances which should be employed and the

* See article on "Ventilation" in "Modern House Construction," Vol. V. (Blackie and Son, Ltd. 1899.)

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cost. To review all the means and appliances at disposal is quite out of the question on the present occasion, but they have a very decided influence, not only as regards partial or complete success, but also a direct bearing on the question of first cost and maintenance.

Much as I dislike making comparison between the work of others and that with which I have been connected, this discussion has been forced on, and we are to meet in the hope of gaining instruction which may be placed at the service of the public. Consequently I shall briefly compare, principally as regards costs of power employed, a few installations of plenum ventilation, and as I shall make use of information derived from printed particulars given by the engineers themselves, we shall at least have fairly reliable data.

Building.	Cubic feet of air per hour.	Change of air per hour.	Power.	Estimated horse-power.	Annual cost for power.	Annual cost per million cubic feet.
Glasgow, Art Galleries	9,050,000	Not stated, probably 3 times.	Electricity	66	*£2,695	£298
Manchester, Technical School.....	12,000,000	3¼ ,,	,,	80	£3,224	£269
,, Midland Hotel.....	6,000,000	3 ,,	,,	40	£1,612	£269
Birmingham, General Hospital	13,000,000	7 ,,	,,	19	£766	£59
Belfast, Royal Victoria Hospital ..	5,000,000	7 ,,	Steam	5½	£100	£20

Consider the importance of such a comparison as regards the number of changes of air effected per hour. May not success in great part depend upon giving an adequate change of air? And surely the question of cost would be a determining factor in many cases.

Reference to the paper by Mr. Henry Lea given in the Institute *Journal* for December 10, 1903, will show how this economy in cost of power is effected. In the discussion which followed Sir John C. Holder personally testified to the success of plenum ventilation in the General Hospital, Birmingham, which he has systematically visited, one may say almost daily, during and since its erection, and I could produce a large number of letters addressed to me containing congratulations on the satisfactory ventilation of that and the Royal Victoria Hospital, Belfast; but I prefer to place before you one because it was not written to me, and because it is from an architect experienced in hospital design, viz., Mr. Batchelor, of Messrs. Carroll and Batchelor, of Dublin, neither of whom is personally known to me. It runs thus:—

"I had been greatly interested in the accounts I read from time to time of the progress of the Royal Victoria Hospital, Belfast, and more particularly in the arrangements for heating and ventilating it. I have had some experience of the plenum system, and have never been much in love with it. I looked therefore rather with distrust on a building which had been so designed as to make such a system obligatory. Mr. Henman is to be complimented and congratulated on his courage in designing such a hospital, and I am free to confess that the result, so far as I was able to judge during my short visit, affords him ample justification for his inversion of many of the accepted canons in hospital design. I was particularly struck by the wonderful uniformity of the temperature maintained in the hospital throughout the twenty-four hours—such as could not, I believe, be obtained by natural means. The freshness of the air in the wards was remarkable, and there was a complete absence of that peculiar odour which is familiar to everyone having to do with hospitals. These results are obtained, I was glad to see, without draught, nor was there any perceptible movement of air in the wards. Everywhere I went through the hospital I saw evidence of great forethought and skill in design, particularly in those small details which count for so much in the economical administration of the institution. The building is a credit to the architects and also to the contractors, who have put such honest and—if I may use the expression—sympathetic work into it. Everything appears to have been done as well as it was possible to do it."

It has been well said that the only way to arrive at a right judgment as to the practical utility of plenum ventilation is to carefully examine it in a building in which it has been applied with knowledge and experience. All I ask, in conclusion, is that the subject may be approached without prejudice or regard to merely personal interests and fanciful misgivings, for a right understanding by the architectural profession on the subject of ventilation must have a vital influence on the health and well-being of the people.'

Mr. S. Perkins Pick said that before commencing to offer any criticisms upon the hospital, he thought that every credit should be given to Messrs. Henman and Cooper for the courage—one might almost say the audacity—with which they had formulated and carried out in all its details a hospital building in a manner so utterly at variance with nearly all preconceived notions of buildings of this class. It must be a source of great gratification to them that the institution after eight months' occupation should have proved so absolutely satisfactory to those who had the working and management of it. He had had the pleasure of making a careful inspection of this hospital under the guidance of the superintendent, and he was bound to confess that in hardly any other instance had he ever received such a laudatory description from the authoritative head of such an institution; indeed, this enthusiasm was not confined to the superintendent alone, but the sisters, the nurses, the engineer, and even the patients themselves, appeared to be equally pleased with the general arrangements provided, and with the heating and ventilation system installed. Now, after stating this it might appear to be blowing hot and cold when he added that, in spite of all the satisfaction expressed, in his judgment the plenum system of heating and ventilating for a hospital was not essential; nor did he think that the advantages of administration gained by having the wards all on one floor were commensurate with the risks incurred, and the loss involved, by the omission of those side windows for prospect and ventilation which most of us so dearly love and appreciate. In hospitals the superficial area and cubic space required properly to attend to each patient were necessarily very large, and therefore the requisite changes of air were less difficult to obtain than in such buildings as assembly halls, workshops, schools, out-patients' departments, and similar places were a large number of people were closely packed together. For these latter buildings he was firmly convinced that, up to the present time, no system gave such satisfactory results as a properly designed plenum system, especially so when some mechanical means was arranged for creating a positive extraction of the vitiated air. In his opinion a hospital planned in separate pavilion blocks, arranged with windows on either side of the wards, with a bed between each, an easily cleaned ventilating heating coil between each pair of beds, and with central open fires was preferable. It appeared to him that this well-recognised style of building was more pleasant for the patients, and adapts itself so readily to effectual ventilation by opening the windows that the complications of a plenum system of heating and ventilation were unnecessary. Moreover, the fact should not be overlooked that in hospitals the majority of patients were in bed, and thus were able to protect themselves from any direct cold draughts which might occur. He knew it might be said that the ordinary atmosphere of some of our large towns was so laden with blacks and impurities that it was desirable to wash and filter the air before allowing it to enter a hospital, and in some densely populated districts where hospitals were on restricted areas this contention might be used as an argument in favour of the plenum; but at Belfast the new hospital was erected on an open site of six acres, with the prospect in the near future of this area being doubled, so that the contention did not, he thought, hold good in this case.

For operating theatres and out-patients' departments he was of opinion that the plenum system was not only desirable, but was almost essential; in the former because the heating and ventilation were easily controlled, and in the latter because a waiting hall crowded with people of the lower classes, and generally entirely surrounded by surgeons', physicians', and other rooms, it was almost impossible properly to ventilate without some mechanical appliances, of which none were better than the plenum. The arrangements provided at Belfast for the out-patients' department were, in his judgment, quite excellent, and, although crowded on the occasion of his inspection, the various rooms were entirely fresh and healthy.

He agreed with Mr. Henman that great caution was necessary in the application of plenum ventilation, and that full knowledge was required to apply the system successfully; indeed he would go further and say that, in his judgment, the causes of failures with mechanical systems of heating and ventilation generally, and particularly with the plenum, more often rested with architects than with heating engineers. He had heard of architects who not only matured their plans, but actually commenced building operations before deciding upon the system of heating and ventilation. Could one wonder at the failure of a system, particularly one like the plenum, which largely depended for its success upon flues of ample area and good lines, when arranged under such adverse conditions?

Another cause of failure in the plenum was that of defective drainage, especially when a building was upon a clay subsoil. This matter was so extremely important that it was difficult to overrate its significance. In some large institutions he had himself noticed that exposed drains had been arranged to cross ducts in an open pipe connected with an ordinary earthenware drain-pipe just outside the duct walls. Any settlement of the duct walls was sufficient to break the joint between the junction of the iron and earthenware drains. These ducts usually carry steam and other pipes, and consequently the temperature in them varies very considerably, indeed quite sufficiently to cause the same joint to be broken by contraction and expansion of the length of exposed iron pipe. In a clay subsoil it is extremely difficult to ascertain whether the damp in walls is ordinary ground moisture or whether it is a sewage saturation. To pump air along ducts where there was a possibility of this was, he thought, the most fatal danger to be guarded against, and wherever the plenum system was adopted he thought that all drains should be dropped below the level of the air ducts, and should generally be carried out with strong cast-iron pipes. Spacious ducts were requisite for carrying steam, hot water, and other pipes to the various blocks of all large institutions, and the same danger which he had indicated existed in all these buildings; but it was largely intensified in the case of plenum ventilated buildings.

Messrs. Henman and Cooper had at Belfast wisely provided a separate duct for the necessary hot-water and other pipes, the main air supply duct being thus kept nearly clear of them. The lines of drains appeared to have been so arranged as not to cross the main air supply duct; he was unable to ascertain whether or not they were kept below the level of the main duct, but what did seriously frighten him was the enormous length of drains which must of necessity be below the hospital buildings. There were the drains from the several operating theatres, and from a number of ward kitchens and bath-rooms, with the complications of traps and anti-siphonage pipes thereto belonging, the latter being all properly carried up through the roof. The whole system was, he was informed, of iron pipes, apparently planned and executed with great care; but the very unpleasant fact remained that there was a length of about 450 ft. of straight main drain, not reckoning the very large number of branch drains connecting with it, all below a dark though, it was true, well-ventilated space under the buildings. Mr. Henman would, no doubt, correct him if he were wrong, but the only traps to any of the fittings he could find were those immediately below the various sinks, etc., and some floor traps. If he were correct, it had not therefore been thought desirable to make use of that ordinary outside trap or gully which usually intercepts sink, bath, and other wastes before drainage finds its way into the foul pipes below the ground. There also appeared to be a lack of those inspection chambers to the drains under buildings which most of them thought were essential in complicated drainage systems for institutions like this. These no doubt were omitted because of the fact that

* The costs of running are worked out proportionately to the amount of power, presuming it is employed continuously.

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they must, if provided at all, be below the hospital buildings. He could not help thinking that this drainage system might prove a source of difficulty in the future. Proceeding, Mr. Pick said :—

"Among other details I inspected the cast-iron vertical drain-pipes connecting the fittings to the drains, and, in the case of those which apparently received the wastes from baths and slop hoppers, the caulked lead joints already begin to show unmistakable signs of drawing. This contraction and expansion caused by hot water running down the pipes is very difficult to obviate safely in a system like that adopted at Belfast. In ordinary cases, where the pipes are all outside a building, the use of an expansion joint is an efficient method, because if the joint slightly opens, the pipe discharging into an outside gully obviates any serious objection; but in the case of this hospital it may be the joints immediately below the fittings, thus opening the drainage system to the hospital, or it may be the joints of the pipes below the building that will draw. From what I saw it does not appear likely that the drains can remain bottle-tight for any lengthened period. Possibly it may be argued that, supposing there were a few leaky joints in the drainage system, what does it matter, when there is a constant sufficient pressure of air from within the building to prevent any sewer gas finding its way inside? But most of us will, I think, agree that it is better to keep dangers of this kind at arm's length, by putting all drains outside the buildings where they are open to the atmosphere; and I think this one objection to the arrangement of a hospital on one floor, extending over such a large area as that we are discussing, and thus necessitating all these internal drains, would wisely prevent most architects from adopting the plan of a plenum ventilated one-story hospital.

"Another detail of the sanitary system to which I think exception may be taken is the low termination of the ventilation pipes to the water-closets at the end of the wards; these are carried only just through the roof at the balcony ends, and when the atmosphere is still it appears to me that there is some chance of a down draught from them being objectionable to any patients who happened to be on the balconies.

"The arrangement of the nurses' slop-room and the water-closet for patients I do not like. I am quite well aware that the objection I am about to make is found in many other hospitals, but that does not, in my opinion, lessen the fault of it, which is that the patients' water-closet is approached through the nurses' work-room, where they must spend a good deal of time washing utensils, mackintoshes, etc. Nurses, I know, become case-hardened, and do not seem to have, or at any rate are not allowed to show that they have, that delicacy about such an arrangement which most of us have; but is it not a little too bad to arrange a water-closet in a manner like this at Belfast and elsewhere, where the division between that and the nurses' work-room is merely a wood partition, which for good reasons is kept well off the floor, and finishes well short of the ceiling level, with the result that it must at times be very difficult for any, even a case-hardened nurse, to face it out? I certainly think that the patients' water-closet ought to be better separated from the nurses slop-room than is the case here, where the main point has appeared to be so to plan the sanitary annexe as to facilitate the one outlet in the water-closet for the plenum system of ventilation, which, I am pleased to add, acts in a remarkably efficient manner in ventilating the annexe. A somewhat similar arrangement is provided for the ophthalmic wards, where the patients' water-closet is placed in a corner of the bath-room; this, surely, is not so good a plan as providing a water-closet separately approached from the ward.

"The non-provision of any larders to the ward-kitchens is, I presume, explained by the proximity of all the wards to the main kitchen. But sufficient milk has to be kept there for the day and night supply, and this in a temperature of 60 degrees, cannot be an improvement upon the ordinary method of providing a small larder, well ventilated from the outside, for this purpose.

"I notice that Mr. Henman states that open windows with plenum ventilation are objectionable, and that by making all the windows of the sanitary annexes fixed he is able to delete the intercepting lobbies, which may possibly be justified in this case; but, speaking generally, I am strongly of opinion that it is a great mistake to construct fixed windows. There are many days in the summer time when it is difficult by the plenum ventilation to obtain that freshness in a building which is so desirable; in such cases why should the windows not be opened? What does it matter in such a case, if the flues are well arranged from sources of contamination, whether they universally act the right way or not? And, besides, in many classes of buildings are there not times when by opening the windows a good air flushing can be given to them without incurring the expense of running the fans at all?

"The engineering work of this hospital has undoubtedly been designed and carried out in a most careful and able manner. There are, however, some points about this portion of the work which might possibly have been improved. I consider that the bottom of main air inlets should have been at least 8 ft. above the ground level instead of about 3 ft., as they are. The boiler-house should have doors or shutters to prevent cold air getting to the boilers, and good top ventilation provided in lieu of the openings. The feed-water to the boilers was on the day of my inspection nearly cold; this is a serious mistake, as it not only increases fuel consumption, but is detrimental to the boilers themselves. The hot well which receives the condensed water is not a good plan; better arrangements can now be had by dealing with the various condense and waste mains leading from the several receptacles which contain steam by an arrangement of heater-condensers. The exhaust steam from engines, etc., after performing various functions in heating hot water, is allowed to go to waste; this is not the most economical arrangement. There are a good many steam traps in the buildings which might have been left out had the system of piping been laid out on more modern lines.

"The engines and fans for the plenum arrangements are excellent in design and finish, but whilst I say this, I cannot but feel that it would have been better for the engineering scheme had it been laid down more comprehensively, and made to embrace the general lighting of the institution by electricity, using the exhaust steam from the generating engines for supplying the whole of the hot water required, and the remainder used in the general heating system. Had this been done, the plenum fans and laundry machinery could have been driven by electric motors, and a considerable annual saving to the institution effected.

"Speaking generally of the plenum system of heating and ventilation I feel, in concluding, that it is only just and due to the architects and engineer to state that, in spite of any criticisms which I have offered in these remarks, the scheme as carried out in the Belfast Hospital is, in my judgment, one of the very best that has up to the present time been executed, and, whether other architects follow the daring lead of Messrs. Henman and Cooper or not, the enormous educational advantage that they have given us in having the boldness to carry out their convictions is, I feel sure, properly appreciated by every member of this Institute."

Mr. A. Saxon Snell said he had been reminded several times of a somewhat unguarded term he had used at the last discussion with reference to plenum ventilation. Whether that term was justified or not, he felt that it was a "huge mistake" on his part to have moved the adjournment of the debate on December 4 because thereby he committed himself to say something at length on the present occasion. As they knew, the original discussion was on Mr. Henman's Belfast Hospital, but the Council had altered it to one on plenum ventilation, and that was a somewhat convenient arrangement because the Belfast Hospital was the very incarnation of plenum ventilation. It was absolutely built for this system of ventilation, and its merits would stand or fall by that system. On the other hand they had not had a complete discussion on the hospital, and so missed doing justice to the very careful way in which the building had been designed. He believed that many people thought the building of a hospital was little more than the arrangement of the building upon certain well defined lines and the rounding off of corners, but as Mr. Henman knew and had shown it was much more than that. There was an enormous amount of consideration to be given to every possible detail as he well knew to his cost. He was very much struck with the enthusiastic care Mr. Henman had given to the building, and, if he might be allowed to refer to it, he could not help saying that it was a curious thing that Mr. Henman in the Belfast Hospital had reverted to a type of ward built by his (Mr. Saxon Snell's) father forty years ago. He referred to the wards of the Marylebone Workhouse which were of the same type though rather worse than Mr. Henman's because they had no top light. Those wards were built to accommodate 600 or 700 persons whom he was assured lived to quite a phenomenal age, but he would not recommend that form of ward as being fitted for a hospital. He thought it was somewhat unfortunate that the question of plenum ventilation had been canvassed so much in the Press by one or two firms commercially interested in the matter. He did not know whether they had been worried by their clients who were furnished with a little Blue Book which comprised a number of scientific remarks on ventilation and purported to be a report of the House of Commons on ventilation. They might have, as he himself had to point out that a little study of this pamphlet would show that it was nothing more or less than a string of quotations (including one of his own) put together to show that plenum ventilation was a mistake. There was really no need for architects to look at it because so many excellent papers had been read on the subject in the last two or three years at the Sanitary Institute, the Institution of Civil Engineers, and other bodies. He had no bigoted objection to the plenum system as a system, and perhaps the best evidence of this was that he had tried lately (and he was sorry to say tried unsuccessfully) to induce a hospital board to allow him to install it for the warming and ventilation of two operating theatres, and would very much liked to have done that because he believed it was really the only method by which those rooms could properly be ventilated and warmed. But they were exceptional buildings and his whole point was that for doing work under exceptional circumstances one wanted an exceptional system of ventilation, and he knew no better system than the plenum for that. The main point of issue was as to the class of building in which it was desirable to use that system; and with regard to that it seemed to him that Mr. Henman had somewhat "hedged," if he might be allowed to say so, on the present occasion, in referring to hospitals only. On other occasions Mr. Henman had let them know that it was only the question of expense which prevented him advocating it for ordinary houses. He thought that hospitals and houses might go together as one, as being buildings for living in, and it was with regard to such buildings that he objected to the use of the plenum system. He should not follow Mr. Henman through the very clever reasoning in the paper because it would take too long, and there were others present far more capable of dealing with that. Mr. Henman asked very rightly that they should treat the subject scientifically, but they should be consistently scientific and go deep enough into it. Mr. Henman commenced by defining the object of ventilation, and that was a dangerous thing to do. As Mr. H. G. Wells pointed out at the Royal Institution lately, definitions were very often misleading, and he thought Mr. Henman's definition of ventilation was also misleading. He would not pause to say why. He had only three points to make, and they had been made over and over again only to be ignored and dismissed by the advocates of the plenum system of ventilation as fanciful and indefinite. In the first place he thought that the downward ventilation was scientifically or mechanically wrong. If they wanted to move an object it was obvious that the best direction was in the line of least resistance, and if they wanted to move it along that line with as little mechanical power as possible they would take advantage of any other powers going in the same direction. That was what happened in the ordinary or natural method of ventilation. The principal contamination of air was from our own bodies, but that very air, contaminated as it was, was in a condition which created the very means by which it was taken away. They knew that it was warm, and, being warm, it was lighter than the colder air which surrounded it, and that colder air propelled it upwards. Therefore, when in plenum ventilation they cause ventilation downwards, it stood to reason that they had to overcome the upward force which was there before they began to move it, and he felt that this was scientifically wrong. His second point was that hot air was surely absolutely bad for breathing. It had been pointed out forty or fifty years ago that hot air was bad

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air to breathe, and it was perfectly obvious because for every volume of warm air breathed there was a less amount of oxygen than in the same air at a normal temperature. It could be easily calculated how much less oxygen would be taken in a given time, and he did not think it needed argument to carry the point further. Then they were told to admire the extraordinary evenness of the temperature which could be maintained by the plenum system. Monotony was held up to them as a virtue. He confessed that that astonished him very much, for he supposed everyone knew how bad monotony was for them in any way. Anyone who had cycled would know how tiring it was to ride along a flat road for many miles, and it was the same with breathing. If they breathed warm air continually at the same temperature it became monotonous, and they became tired very quickly. He had not time to refer to the long passages for driving warm air into the building beyond saying that he knew engineers had recognised the evil, inasmuch as he had been told that some had suggested violet-coloured electric lights in the passages with the view of getting the beneficial effects of sunlight on to that enclosed air. Mr. Henman had shown a great improvement in having the ducts above ground. He remembered many years ago the late Mr. P. Gordon Smith speaking of an incident which occurred in his journey with the late Dr. Moffatt and his (Mr. Snell's,) father on the Continent to see a number of hospitals, and especially of certain mechanically ventilated hospitals. In most cases the machinery was out of order, and the systems were not at work, but in one hospital in Berlin it was working, and the superintendent showed them round with great enthusiasm, and pointed out the ducts where the warm air entered. In one ward he showed where it came in immediately under the door, and Mr. Gordon Smith remarked that it appeared that dust might easily be swept into it. The grating was taken off and Mr. Smith put his hand down and drew it out two inches thick in mud. At any rate, Mr. Henman had improved upon these channels. Still the air had to be carried along dark passages, and they knew that air not freshened by the sun became foul, and deposited a number of bacteria on the sides of the channels. It was a curious thing also that what we might call the harmful bacteria, like everything else harmful in this life, always increased and multiplied in the dark. In the sunlight they became harmless. There was one other thing he would like to refer to, which would, no doubt, draw from the practically minded person a great deal of criticism and perhaps some ridicule, and that was the moral aspect of the subject. The world was full of inventors designing any amount of things to improve upon the works of the Creator. Many of these inventions were of enormous benefit to our kind, but a great number of others were simply invented for getting over the abuse of nature. He supposed there had been no greater progress made in the last century in any science than in that of medicine, and yet the great medical men were unanimous in saying: "We can only mend you with our medicines; go back to nature; go into the fresh air and live purely and properly and do not come to us." Medicines were excellent in their way for getting over difficulties, and we are prone to fly to them at once, but they knew the effect of taking drugs too often was very bad indeed. It was much better to trust to the machinery of nature itself, even although it was a little harder at the time. Architects in the same way had certain responsibilities in advocating the natural method of doing things rather than the artificial. Unfortunately most of them had to do what they were told and make the best of bad circumstances, but there were plenty of occasions when their advice was sought, and when they had the opportunity of advising their clients as to the best method of doing things, and he thought they should be at one with the physician in trying to persuade their clients to have their houses built in such a way that they could live healthily instead of merely comfortably. No doubt it was a very good thing to be able to legislate for a large number of people, and to feed and clothe them and look after them; no doubt it was good to be an autocrat in that way, and rule and control men, but there was one thing much better, and that was to teach their fellow men to rule and control themselves.

Dr. S. Rideal said he had not read the paper nor had he seen the Belfast Hospital, but he thought he understood what the plenum system was, and he had read arguments for and against it. The speech of Mr. Saxon Snell was very interesting, but it was not what he would call a scientific statement of the objections to the plenum system. It was very pretty and poetical and the analogies were interesting, but still the subject was not dealt with in that speech from a scientific point of view. It might be perfectly true, as Mr. Snell argued, that if one could introduce the pure air of nature into hospitals it would be the best thing, but apparently Mr. Snell's father in the past had had to put up buildings to accommodate 600 inmates in the middle of a big town where the problem of getting fresh air was not by any means so easy as it was when they had a hospital standing like the Belfast Hospital, on six acres. They had to deal with the problem of the ventilation of hospital wards and buildings in confined spaces, and then he thought they must all admit that the natural method of opening the windows, and so introducing fresh air, was not a method which commended itself to them in the present century. There must be artificial methods of ventilation, and if one admitted the proposition that artificial ventilation was necessary, then the forcing in of pure air must be the method which commended itself rather than the methods of extracting air by means of fans. They were told that the dark passages allowed the organisms to settle down and multiply, but if they settled down in the passages it was so much the better for the air. If they did not do that, but went forward, then it was necessary to ensure that the air was rendered germ free before going into the hospital It was obvious from the illustration given by Mr. Snell of 2 in. of mud being found in the duct at a Berlin hospital that that was certainly not a method either scientific or commendable. But he thought it was possible to introduce fresh air without the objections mentioned by Mr. Snell. They could remove germs and they could remove dust, and could warm the air, and have a hot air capable of being breathed without the disadvantages mentioned. It was perfectly true that a somewhat less quantity of oxygen per respiration might be introduced, but, on the other hand, it would be germ free and dust freed, and physiologists would tell them that the necessary oxygen would be obtained by the person breathing a little more quickly. The removal of the products of combustion—of the *esprit de corps* as it had been called—of the human being was very necessary, and yet, on the other hand, it was extraordinary how very little ill effect was noticeable from the products of the combustion of gas in rooms. It had been asserted that the sulphur in coal gas was most deleterious in rooms. He had recently had occasion to go most carefully into the subject, and he found that the advantage of gas burning in rooms, from the ventilating point of view, where there was no plenum system of ventilation, was very great as compared with the electric light, and the quantity of sulphur produced was only 1,000th part of the quantity of sulphur produced by burning coal. The actual quantity of sulphur in the air of a room lit by gas was less than the ordinary quantity of sulphur in the outside air on a foggy day, and not much higher than the quantity in the air on an ordinary day. That was taking an ordinary room, with basic lined and plaster ceiling. When, however, they came to modern rooms, with thick varnished Japanese ceiling and so on, they had a very different state of affairs. In these modern rooms the decorations themselves caused the sulphur in such rooms to increase, because it was not absorbed, and they seriously involved the question of ventilation. In an ordinary room the ventilation through the walls and the absorption through the basic lining rendered the effects of the coal combustion in rooms not very serious. In conclusion, Dr. Rideal explained the working of Aitkin's coniscope, and said that by the means of that instrument one could determine the dust particles in different parts of a room very easily, and could trace the ventilation and get much better results.

The Rev. J. B. Lock said it appeared to him that they had been accustomed for years to mechanical ventilation. Some people spoke as if mechanical ventilation was new, but surely the fire was a mechanical method of ventilation. It was the vacuum system, and they had always been accustomed to get their rooms warmed and sweet by an ordinary fire, which really drew the air from the ground level and carried it up the chimney. The advantage of the fire ventilation was that they did not warm the air which they breathed. They warmed the furniture and the bodies of the people in the room, but the air they breathed was of the ordinary temperature to a great extent of the outside air, and he supposed they were all familiar with the fact that they could tell if they went into a room where there were a great many people whether there was a fire burning or not simply from the sense of freshness which it had. The mechanical system of ventilation by the ordinary open fire seemed as good a one as could be devised until one came to the fan. He had had to take the responsibility of assisting to decide on a system of ventilation at Cambridge, and in one building they decided to have the vacuum system and in the other the plenum. The plenum system they put into the medical school, because there they wanted more certainty in the ventilation. It appeared to them that the plenum system offered the means of providing a certain quantity of fresh air in a certain time. The vacuum system was more rule of thumb. By the plenum system they had the advantage of forcing air in passages, and by means of valves they could decide how much fresh air they would admit into each room, and it seemed to him in the case of a medical school that was an overwhelming advantage over any other system at present before them. With regard to the vacuum system, the arrangement one usually found was that the great chimney of the building was used as an extract shaft, and openings were made into this. Some people might do it scientifically, but he had not found any specimen of that—they made openings in it and hoped for the best. It was a very good system of its kind, and was very much like the open fire system. To illustrate one difficulty of the system, he might take the Leeds Medical School, which he had been over. They found there that the central shaft had in it an iron pipe, which was to carry the product of combustion up the chimney, and the warmth was to be distributed through this iron pipe to the central shaft. On some days this worked very well, but on others the heat in the shaft was not sufficient to get an extract for the top rooms, with the result that the air drawn from the lower rooms percolated into the top rooms, and they were told that the smell of the dissecting-room pervaded the whole building. This seemed to point to the necessity in any system of having sufficient mechanical force to have control of the extracts. It seemed to him that in certain cases the plenum system was one they could not do without. He had been over Pitman's School, in Southampton-row, and found that in that comparatively small building there were about a thousand young men and women at work during the day. They were supplied in each room with air by a fan working in the basement, and it seemed to him impossible to imagine any other system by which that building could have been made of real use except by the plenum system. While one hoped that architects and those interested would evolve the methods of applying these various systems, yet, as an outsider, he would be inclined to say that there was no system which should be run to death. They must consider what were the requirements of each particular case and apply the system which fitted it. He would like to say one word about what was called the natural system, and he must not speak exactly as he would like to speak, as he might speak too rigorously; but to say that a natural system without a fire—and the fire was a mechanical system—could ventilate throughout the year a building which had a great many people in it was absurd. They would have to depend practically on the wind blowing with sufficient force in the same particular direction every day of the year.

Mr. W. K. Parry (Dublin) said there was just one point which wanted bearing in mind in connexion with ventilation, which was the weight of air which had to be moved. He supposed few architects considered it, and he had not himself until he heard it pointed out that the amount of air moved in the room where the statement was made was about 20 tons in one hour. It would be impossible without resort to mechanical means to remove anything like that weight of air per hour, and if they had tried to deliver it like one would coals by a cart it could not be done quickly enough. He was not there to advocate the plenum system of ventilation, but he was interested in the system of ventilation, and there was one point brought

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to his notice on which he believed the plenum system depended. If instead of the plenum system they had radiators, there was an enormous difficulty in keeping the radiators clean. Whatever might be said as to the difficulties of keeping the air passages connected with the plenum system clean, the difficulty was ten times greater when the dirt got into the folds of the radiator. He was concerned in the question of the heating and so on of a lunatic asylum, and he found that the patients selected these radiators as their spittoons. If the sputum was dried on the radiators the fresh air would come into the building laden with the germs. So far as the plenum system was concerned, it did away with the necessity for any such coils in a room, and they had them in subways, where they could be kept clean, and when the air came into the room there was no opportunity for the patient to foul it, as they could do when there were radiators in the room.

Mr. Harold Griffiths said he was somewhat surprised and greatly amused by the remarks which had fallen from Mr. Snell. Mr. Snell referred to air being so regular as not to be conducive to good health, and said that more variation was necessary. He omitted to say that with the plenum system the temperature of the air could be raised in the winter, while in the summer time it could be at least fifteen degrees lower in temperature inside the building than was the outside air. He thought that was all the variation that was necessary. As to plenum installations, he felt sure that if members visited buildings—either workshops or schools or any buildings in constant occupation, and especially those in the East End of London occupied by aliens—which were installed with the plenum system, and then went to another building not so ventilated, they would come to the conclusion that the plenum system was the right thing. There were four matters which, it appeared to him, had to be borne in mind to make a successful plenum installation. The first was with regard to air purification. He could not compliment Mr. Henman upon the success of the screen which he had adopted at the Belfast Hospital. He was aware that they were the general screens of jute or cocoanut fibre, but under no consideration could it be said to be satisfactory. If the air of Belfast was anything like the air of most of their provincial towns, it would not be many months before the screen showed the result of the impurities drawn through it, and although the screen was put so as to take down in sections, yet he ventured to say it would be impossible to remove all the soots and other deposits upon it. If any gentleman would walk past a screen which had been in use twelve months or two years in any installation within the United Kingdom, he knew he would find a distinct odour emanating from that screen, which he felt must foul the air which passed through it. A much better screen was that adopted by another patentee—a revolving screen; but that also in his opinion was not a perfect screen. His second point was in regard to the dust. He had visited about fifty installations, and had always found that in connexion with the heating batteries the ducts could be washed by the hose, but he had never seen the heating pipes so arranged to enable the dust to be properly washed off them. Recently he was called in to report upon complaints which had been made with regard to a plenum installation, and he found that many of the intakes had been partly closed up, and when he asked the reason he was told that the air which came in was bad air. He went down to the basement and made a careful examination and found that all the heating batteries were literally covered with dust, and directly these batteries became hot a very noxious and almost dangerous odour emanated. In his opinion the batteries should be galvanised or treated so that at least once a week they could be effectively washed with the hose in connexion with the ducts and vertical flues. His third point was in connexion with the velocity of the air delivered. Some patentees and architects agreed in delivering the air at a very low velocity, and others at a considerably higher velocity. If they had a very low velocity with the plenum system it was so sluggish that there was not what he might term sufficient "back" in the air properly to circulate it in the room until it found its way to the extract. Those in the other extreme drove the propellers between 500 and 600 revolutions a minute, and thus the air was delivered at between 6 and 7 ft. per second, and the result was a considerable draught. He did not know that anyone could lay down exactly the rate at which it should be delivered, but he should think it should be between 4 and 6 ft. The last point was with regard to the shape and form of the inlets. There was a tendency in some instances to save cutting the brickwork or to maintain the regular architectural features in others, and to form bends in the inlets, and the result was that the air had a tendency to shoot out in a horizontal direction and fall on the heads of people in the room instead of circulating properly in the room. With regard to the extract no lines could be laid down, and every case had to be taken on its merits, but in most of the schemes he had seen they had been much too small. If these things were borne in mind he felt sure that in all buildings where there was a considerable occupancy no better system of ventilation could be found than the plenum.

Mr. E. W. Hudson asked whether the advocates of the plenum system pinned their faith absolutely on the admission of pure air at a high level, and the extraction of the foul air at a low level. If that was the case experience had shown that it was not the right thing to do. He had read an account of such a system introduced by Sir Joshua Jebb into Pentonville Prison. He believed that the system had been condemned and whether it was in use now he did not know. It seemed to him, however, that the system was an entirely erroneous one. He would like to move that the discussion be adjourned because the matter had, he believed, a medical aspect. It had been largely adopted in the United States, and he had tried to get information with regard to it, but that had not yet come to hand. He understood that it was adopted at the Capitol of Washington and was not a success, and he was anxious to know whether they were going to use it for the large buildings at Boston and New York. He would also like to know what the leading architects of Great Britain thought of it as evidenced by the number of buildings in which it was being installed. He had seen notices in London that buildings were to be ventilated on the plenum system, and if they could get this information it would be a good thing.

The Chairman said he was afraid it would be impossible to have another meeting.

Mr. R. Langton Cole said they had heard a good deal about the monotony of air, but these mechanical systems had been in use long enough to enable actual facts to be obtained. Surely it would be possible to compare a modern, well-designed pavilion hospital of the same scale as the Birmingham General Hospital or the Belfast Hospital, and see what actually happened to the patients, and let some unprejudiced person tell them the actual result. In his opinion a mechanical system of ventilation was advisable and excellent for special cases, but for a hospital where the wards were built on the pavilion system it was not necessary.

Mr. A. E. Munby said he had been furnished with some calculations with regard to the use of furnaces for heating apparatus, and he found that 95 per cent. of the total work done was employed in merely forcing the air through the coals. One thing which always struck him as being neglected was the possibility of using the furnace, which was to heat the building, as a means of ventilation. They were in the habit of installing furnaces for heating so that the air was drawn in through the boiler-house door which seemed rather wasteful. There was no reason why they should not be made to suck the air from the rooms. It would be interesting to work out the relation between the sucking power of a stove for purposes of ventilation, and the cubic space of the building which that stove would warm. It had been calculated that a furnace for the proper heating of a building was capable of changing the air in that building once every two hours. That would be useless for general ventilation, but it might be utilised for large buildings without additional cost.

Mr. Max Clarke said he took it they had come to decide more or less whether natural or automatic ventilation should be used as opposed to what was called the plenum. They had had a certain number of remarks on the merits and so on, and a certain number of remarks which applied more or less to natural ventilation, but they had had no information whatever as to what the advocates of natural ventilation did really advocate. Mr. Snell said something about it, and Mr. Lock said that if the wind always blew in the proper direction it would be satisfactory. He came with one or two ideas on the subject, and the only practical information he had received was that the plenum system was good in certain cases. But those certain cases he would like to think were all the cases where large buildings were concerned—that there was no other method whatever that would ventilate a large building properly. The object he took it was to change the air at a certain specific rate. As to what the rate was that could be regulated by the people who devised the system. He was not concerned with that now, as to how the air should be cleared, because all these were matters of detail. What he was a little concerned about was whether the forcing of the air in and the washing of it and the sending of it through heating batteries would or could change the air in its essence? That was really what he would like some information upon. He had devoted years to this subject which was a purely scientific matter. People told them that four parts in 10,000 of carbonic acid gas was as much as they could do with. Supposing that amount was reduced by the plenum system, would that be better than the air blowing over the ocean? Or was there some quality in the air of the ocean which they did not know anything about? No one would deny for a moment that patients would be better always in the sunlight, but they could not always have sunlight in Queen-square where he lived, although the square was crowded with hospitals; nor could they have it in the Liverpool-road or always at St. Bartholomew's Hospital. If it was necessary that the hospitals should be in such places, was it not better to send in to the patients air as pure as they could make it rather than trust to Providence? That was the question they had to decide, and all the little bickerings as to how it should be done, and as to the size and the bends of the pipes, were mere matters of detail which they would not learn all about at first. He thought that they as architects did not provide a proper system of tubes to carry this air along. He felt it was the smaller tubes which required very much more attention, and would like to suggest that someone should experiment with cast iron ones—glass-lined, or lined with vitrious enamel. Mr. Snell said that for exceptional work and exceptional buildings natural ventilation was not the thing, and he (the speaker) took it that every hospital was an exceptional building.

The Chairman said there was no doubt this was a most interesting and vital question for architects. At the present day when they erected buildings they must make up their minds as to the best way of ventilating them, and the time had gone by when they could ignore that. He certainly thought they had spent the evening well, and that they might spend another evening some day on the same subject. There was one matter he would have liked to have heard touched upon, and that was the question of cost, for it was a question which could not be left out of mind at the present day. Cost was not everything, but it did have an effect, and was one which the architect in such a matter could not ignore. He was afraid that the cost was rather in favour of the direct heating system by radiators, but they must remember that with the plenum system they were not only heating the building but were also ventilating it, and therefore in considering the cost of the two systems it was not fair to take the cost of the heating only in one case as against the cost of both heating and ventilating in the other. Personally he felt that with buildings largely crowded with people, such as class-rooms, and schools, it was most essential to change the air very frequently, and undoubtedly the plenum was the natural way by which they could secure a continuous change of air. He thought that if in the room they were meeting in there was some means of changing the air a little less naturally it would be a distinct advantage.

The Chairman announced that the next meeting would be held on June 20, at 8.15, for the presentation of the Royal Gold Medal. The memorial to the late Mr. Penrose in the Crypt of St. Paul's would be unveiled by Sir Lawrence Alma-Tadema on June 18, at 3.30, and members were invited to attend in memory of their respected past President. His (the Chairman's) last "At Home" would also be given on the evening of June 18.

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MAGAZINES AND REVIEWS.

THE *Art Journal* is naturally largely occupied with a review of the Royal Academy, in connection with which it gives a separate full-page plate of Mr. Furse's "Diana of the Uplands," a picture which has won all hearts; and by a review also of the New Gallery. An illustration is given of Mr. Brock's sketch model for the Queen Victoria memorial, with some larger illustrations of the separate groups of sculpture. The whole monument is to be executed in Carrara marble, except the crowning group, which will be of bronze gilt, and the lions and figures with them on the pedestals around the outer circle, which will be of bronze. These flank the four flights of steps; the low quadrant walls between show indications of an intended bas-relief, whether in marble or bronze does not appear. The scale of the whole thing is immense, and when completed it will furnish a worthy and imposing monument to a great Sovereign, though we must regret that the architectural portion of the memorial has been so much cut down. Mr. Lewis F. Day contributes an article on "The New Lancastrian Pottery," made under the direction of Mr. William and Mr. Joseph Burton, of the Pilkington Tile and Pottery Company. The characteristic products of their system, of which nine examples are shown in a fine coloured plate, appear to be vessels in which shape and colour and the natural texture effects of the glaze are relied upon, without any formal decorative painting, the jars being simply shaped masses of fine colour, with only some natural markings resulting from the flow and break-up of the glaze. This ware seems, judging from the illustrations, to merit all that Mr. Day claims for it.

The *Magazine of Art* also devotes a good deal of space to criticism and illustration of the Academy exhibition; and Mr. Archibald Sparke, the Director of the Bury Art Gallery, contributes an article on the contents of that gallery, which seems to contain many good pictures and also some fine examples of Wedgwood ware. An article by Mr. Horsley Hinton on "Artistic Photography of To-day," an art in which we do not very much believe, is interesting to us because most of the examples of photography illustrated (the work of Mr. Frederick H. Evans) consist of illustrations of cathedral interiors. It is impossible to judge of the effect of photographs of architecture from a further reproduction which only shows them at second-hand, and gives a different surface texture from that of the photograph itself; but we are glad to see that any photographer who studies the artistic effect of photography is occupying himself with architecture. We have always maintained that architectural subjects are peculiarly suited to photography, and that they are very much neglected in most photographic exhibitions. "Cameo Cutting in France," by Mr. Cyril Davenport, is an article on a most fascinating subject, with some interesting illustrations. The "Symposium" on the subject of "L'Art Nouveau" is continued. Among the writers taking part in it this month are Mr. Marcus Stone, Mr. G. A. Storey, Mr. H. H. Statham, Professor Gerald Moira, Mr. F. Hamilton Jackson, all of whom write at some length and are all in the main adverse to it; so, in much briefer terms, are Mr. J. W. North, Mr. Aston Webb, and Mr. Luke Fildes, the latter of whom merely makes the characteristic remark "The 'newness' of art does not interest me." Mr. Wake Cooke thinks there is much promise in *Art Nouveau* "if rightly taken" (what does that mean?); Mr. Colton thinks that anything that keeps art moving is good, "but, like an aperient, we wish to forget it as soon as possible"; and Mr. J. Farquharson thinks that no new departure in art, whether Pre-Raphaelitism, Impressionism, or whatever else," has ever come and gone without leaving something good behind it"; which is about the only real crumb of comfort offered us on the subject. But it is hardly fair of the editor to label the communications at the head with a single phrase picked out from them. That by Mr. Statham, for instance, is headed with the words "perfectly detestable," but any one who reads it will see that this sweeping expression is *not* applied to the whole subject of *Art Nouveau*, but only to the one point mentioned in the writer's concluding paragraph, viz.: the employment of broken curves in ornament instead of tangential curves; and the heading is a misrepresentation of an article which is not really sweeping in its terms.

The *Architectural Record* (New York) devotes a great deal of space and illustration to the St. Regis Hotel, which appears to be the last hotel *de luxe* of New York, designed to surpass everything of the kind previously attempted. It is not worth all the importance here attached to it. Externally it is one of those enormously high triangular erections, on a site at the junction of two streets and running to a point at one end, which are the worst form of American high building. The illustrations of the practical portions of the interior are of some interest, but the ornate rooms appear to be inspired by the Hôtel Continental at Paris, which is certainly not a model of refined taste. We observe, by the way, that the bathroom belonging to the State suite of apartments, and therefore supposed to be the model bathroom of the building, has that unpleasant and insanitary arrangement of a pedestal water-closet in the same room and close to the bath, the uncivilised nature of which the Americans, with all their attention to sanitary refinements in other particulars, seem still unable to perceive. A more interesting subject in the same connection is an account and illustrations of the first American high building erected entirely in concrete-steel; *i.e.* concrete with steel stiffeners imbedded, in place of the usual steel-framing with a masonry or terra-cotta decorative skin. This is the Ingalls building at Cincinnati. The exterior appearance, though exceedingly plain, is not unpleasing; and there can be no doubt that this is both a much more truthful and a much safer style of building than the steel-framed one. Messrs. Elzner and Anderson are the architects. For the metal re-inforcement a system of cold-twisted square bars is used throughout.

"The floors are continuous slabs 5 in. thick, re-inforced with a mesh of ½ in. square twisted steel bars from 18 to 20 in. on centres in both directions and strengthened by a beam or rib across the centre of the column bay 16 by 32 ft., dividing this into two panels, each 16 ft. square, without any other supporting beams.

"The columns have stiffening bars placed on two opposite sides near the surface to take the wind strains. They are further re-inforced near the centre by compression bars, which take up all such load as may be required in excess of the carrying capacity of the concrete alone. These bars not being in tension need not be twisted, and accordingly plain round bars were used of various sizes, according to location, from 2½ to 3½ in. in the basement, diminishing in numbers and sizes in succeeding stories until they were reduced to 1 in. and then entirely abandoned at about the tenth floor, from which point on the concrete was sufficient to do all the work. . . . The question has been asked as to how the girders were connected to the columns. Very simple, indeed; the girder bars merely extend in between the column bars, and the concrete of the one being monolithic with that of the other completes and perfects the connexion, than which nothing could be more secure.

In the course of an article on "the present system of architects' charges," by Mr. Arne Dehli, a very strong attack is made on the five per cent. system, as in almost every way illogical and unsatisfactory. We have long been of the same opinion, and are glad to find it supported so strongly in an American architectural publication.

In the *Berliner-Architekturwelt* the principal architectural work illustrated is an extraordinary street front called the Alt-Bayern House, in the Potsdamer-strasse at Berlin. There is a flat centre, with end compartments on a segmental plan, and a modillion cornice which curves in plan round the segments, and then curves upward over the centre of the building like a wave, with nothing to divide or start the curves; a curious example of the passion of modern German architects for running everything into curves. The ground story is all glass, again in bulbous curves; above it the front is partitioned out by narrow piers of something like the half section of an early Gothic pier, and three tiers of small windows between. The central entrance is a *tour de force* in the shape of a projecting segmental arch curved on plan, with life-size nude figures standing out in high relief from it. How it is all carried there is nothing to show, for there is no visible abutment but windows. The materials are given as "Niedermendiger Basalt-lava," glass mosaic, copper, and bronze. Herr Wilhelm Walther is the architect. The whole thing looks horrible to English eyes, but it cannot be denied that there is a cleverness about it. Among the more sober designs illustrated is a good front of business premises in the Jerusalem-strasse by MM. Cremer and Wolfenstein, and part of the elevation of business premises in the Ritter-strasse by MM. Berndt and Lange, an original and not unsuccessful attempt to apply classic architectural details to a warehouse front which is nearly all glass and iron. In the ground story are plain heavy rusticated piers; on these are Roman Doric fluted pilasters (freely treated) which run through three stories of glass and iron, the small lattice girders that carry the floors visibly butting up against the stone pilasters; above this is a massive stone lintel carrying what may be called an attic, with solid piers sculptured with a figure in relief, above each pilaster, and two Ionic colonnettes dividing the space between, which otherwise is entirely glass. Over this is a plain but emphatic stone cornice, with heavy cantilevers over the piers and colonnettes. This attempt to press classic materials into the service of warehouse building is very clever, and the details are refined.

The *Architektonische Rundschau* does not illustrate any very noteworthy work; indeed, the competition design for an Evangelical church at Innsbruck is equally poor both as design and drawing. We come across MM. Cremer and Wolfenstein's work again in the shape of a Berlin street house, which is far more French than German in type, and good of its kind but not very interesting. A large building for a shopkeeper's or shop-men's union at Stettin has a good deal of character, as far as one can judge by a rather sketchy illustration, though it is rather crushed by its enormous roof; MM. Hart and Lesser, of Berlin, are the architects, but it is not quite apparent whether it is an actual building or only a competition design.

In the *Burlington Magazine* Mr. Clouston's article on Claydon House is concluded, and accompanied by some fine illustrations, showing the staircase with its fine and delicate iron balustrade, and the chimney-piece in "The Pink Parlour," a fine design in the main, but rather ragged in its carved detail. The straggling plaster decoration on the wall over it is an example of the mistakes of the Adam style; it is not only *rococo*, but bad *rococo*. The conclusion of Sir E. Maunde Thompson's article, "A contemporary account of the fall of Richard II.," is accompanied by eight curious and interesting designs from the Harleian MS. of the Chronicle of Jehan Creton. An article by Mr. Roger Fry on the exhibition of the French "Primitives" is the occasion of giving illustrations of several of the works in that interesting exhibition.

Arts and Crafts, which is called "a monthly practical magazine for the studio," etc., is a very useful publication for young art-students, containing minute descriptions of processes in various classes of art-production. There is, for instance, a description of the process of modelling a bust, with photographs of a bust by Professor Lanteri (now in the Academy) in various stages of development. Lessons in wood-carving and in book-binding, with practical illustrations are among the subjects. Perhaps the value of such a publication is most felt by young amateurs who wish for guidance in taking up this or that form of artistic handicraft. Students who are preparing to make a profession of any art want fuller teaching than any magazine can give them; but "Art at Home" should be greatly assisted by *Arts and Crafts*, as it gives description and illustrations of the actual process of working.

Knowledge and the Illustrated Scientific News, the new title of the monthly periodical formerly called *Knowledge* (which has changed hands), seems to have the same value in regard to scientific information which belonged to the paper under its former status, and is rather fuller and more varied in subject, but also seems rather more laid out for popularity, which was perhaps necessary. The most valuable and interesting paper is that on "The Mechanical State of the Sun," by Professor Sampson, which we recommend to the notice of those interested (as every one ought to be) in the physics of the centre of our system. There is a good illustrated article by Major Baden-Powell on the Aero-plane experiments at the Crystal Palace.

In the *National Review* Lord Lytton writes a short article on the subject of the Chantrey Bequest, summing up the case against the Royal Academy in a manner which is concise, logical, and absolutely unanswerable; a matter which will not trouble the Royal Academy, whose policy is to assume that they are infallible and to answer no one. Lord Lytton draws attention, however, to one answer on the part of an individual Academician, which had escaped our notice, and which seems to give some explanation of the proceeding of the Academy in always purchasing out of their own exhibition. Mr. Boughton averred that the Academy

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could not purchase a picture of Whistler's which had been exhibited elsewhere, because by the Chantrey Bequest every work purchased must be exhibited at the Royal Academy, and by the Academy rules no picture can be exhibited there which has been exhibited before in London. As the Chantrey Bequest says nothing about exhibition at the Royal Academy, but only says the purchased works must be publicly exhibited, it appears as if the Academy, in its corporate capacity, either has not read the terms of the bequest or cannot understand them. However, it appears that there is to be a Government inquiry into the administration of the Trust.

In *Scribner*, under "The Field of Art," Mr. W. C. Lawton and Mr. Russell Sturgis write on the interesting questions suggested by the title "Poet and Artist" ("Poet and Painter" would more correctly represent the scope of the articles). Mr. Sturgis's article is the more interesting of the two, and he makes a good point in his comparison in regard to the form of expression in poetry and painting. He shows how exceedingly essential the form of expression is in poetry, taking as an example a well-known stanza of Shelley's—that commencing "When the lamp is shattered," and inviting the reader to consider how little impressive the thought itself would be if expressed in plain prose. But then, he adds, in painting the artistic language is not only an important element—it is *everything*. "Try to separate the thought in a landscape from the artistic language used in rendering that thought, and see where you come out!"

"Nor should anyone deceive himself by supposing that each artist, poet and painter, is busied with trying to represent or describe or relate something, each in his own language. That is not at all the case. No work of art that is worthy of the name has for its principal subject Description or Narration, or even Representation. The poet-artist, as the secondary consideration (*by the way*, as it were), may represent an old tree or house, relate a pleasant or a ghastly incident; but that is not the purpose of his work of art, either in verse or in painting. His purpose in each case is to produce a work of art. And the real difference between the graphic arts on the one hand and poetry on the other is that in the graphic arts the mere language, the use of the language, the glorying in and delighting one's self by the mere use of the language, is so very much—in nine cases out of ten—that the thought which has been nominally the purpose of the undertaken work of art disappears altogether and the noble language remains alone in the artistic result."

"A Sculptor of the Prairie" is the title of an article in the *Century* on the work of Mr. Solon H. Borglum (what an exceedingly Trans-Atlantic blending of names!), whose work we think we previously saw a notice of in another American magazine. Mr. Borglum is a student of the wild horse and the wild Indian (so much of him as is left), and the works illustrated show a kind of downright and original energy, but not sculpturesque style in the higher sense. Mr. David R. Francis, the President of the St. Louis Exhibition, contributes a short article on "The attractive features of the St. Louis Exhibition," which is in such an exuberant style of trumpet-blowing that one wonders why he even used the phrase "attractive features," as in his eyes it seems to be all one great glory of "attraction." It may be all that, but one rather feels that the praise would have come with more weight from some one not officially connected with the exhibition.

Harper includes, under the title "The city of beautiful towers," a description of a visit to San Gimignano by Miss (or Mrs.) Hale, with sketches by Mr. Walter Hale. San Gimignano is always interesting, but we hardly think "beautiful" is the adjective to apply to the towers, except in the sense of combined effect; as towers they have no special beauty either of form or association, being in fact the grim relics of a barbaric age of feud and fighting.

In the *Monthly Review* there is a curious fanciful article by Mr. Bernard Holland, consisting of "A Dialogue" between the Cathedrals of Amiens and Canterbury, the ancient cathedral retaining its old uses and the ancient cathedral put to modern uses. The points in the dialogue are partly theological, but there is something of more than theological or ritual interest in Canterbury cathedral's sense of discrepancy between its old memories and its modern experiences:—

"Sometimes I am tired of the crowds, and of their songs, and of all the sermons preached to them from my pulpit. I was not built for this kind of thing. At the end of Sunday I feel quite exhausted. Perhaps I am too old for modern ways. Often I wish to hear again the monks chanting their old Latin words and slow music in my choir, and to inhale the faint perfume of the incense. Once, not long ago, a sweet woman sang 'Salve Regina' in the darkness of my crypt. It cost me a pang of memory. And these excessive rows of monotonous and meaningless and mechanical lights, how readily would I part with them if I might have in exchange the soft, symbolic darkness, lit here and there by a few starry candles, dimly revealing solitary worshippers. I dislike these formal congregations. I do not care for hearty and popular services. I feel more like my old self on a winter afternoon, when they chant their evensong, and I am but a little illuminated, and very few mortals are in me. In the summer afternoons I am tired to death by the multitudes who traverse me, it seems, merely in order to gaze with dull satisfaction on my monuments. They do not understand me as the old pilgrims did, nor I them."

Others surely must have felt what is here so picturesquely expressed—the gulf between the life of which our ancient cathedrals were the outcome, and the life which surrounds them now.

"A Journey from Edinburgh to Paris in 1802," in *Longman's Magazine*, if a genuine diary of the period (and it has the appearance of being so), is interesting in the sketch it gives us of the realities of French travel, and of the aspect of Paris, in the days of the First Consul. We quote a part of the description of Paris. He contrasts the approach to London, with its villas and gardens and crowds of vehicles, with the solitude around Paris.

"Not a villa to be seen and hardly a mortal to be met with on the road. No coaches, nor curricles, nor pleasure horses, nor waggons: but here and there a few Englishmen going to Paris or returning, now and then a messagerie, or wretched stage coach, and straggling parties of whiskered soldiers, and, with the exception of these, all is silence and solitude. . . . In passing through the narrow streets of Paris on our way to the hotel, we were struck with the mode of disposing of the lamps. They are suspended in the middle of the street, about 15 or 20 ft. high, from a rope which runs across from one house to another. The lamps themselves are very large, something like the shape of the lanthorn upon the stern of a ship of the line. They throw a great light not only upon the street, but into the windows of the houses, so that at their windows on both sides any person may read by lamp-light, and the general effect is pretty. But the closes and lanes of the city, and with which, like Edinburgh, it abounds, are necessarily left in utter darkness. The streets are narrow and dirty, much like the Cowgate."

The diary purports to be that of "Robert Sym, Esq., Clerk to His Majesty's Signet." If it is not genuine, it is very well done.

The *Pall Mall Magazine* contains an article by Miss Marie Van Vorst, rather exaggerated in its appreciations, on the life and works of that talented but rather unequal and eccentric painter M. Paul Besnard, accompanied by a good many illustrations from his works; which, however, depend so much on the colour scheme that they can only be very inadequately represented in black and white.

In the *Gentleman's Magazine* will be found a very charming article by Mr. Alexander H. Japp, under the title "A Vision of Trees"; considerations as to their various picturesque characteristics and associations, with remarks on the truth of some references to them by poets—Tennyson especially.

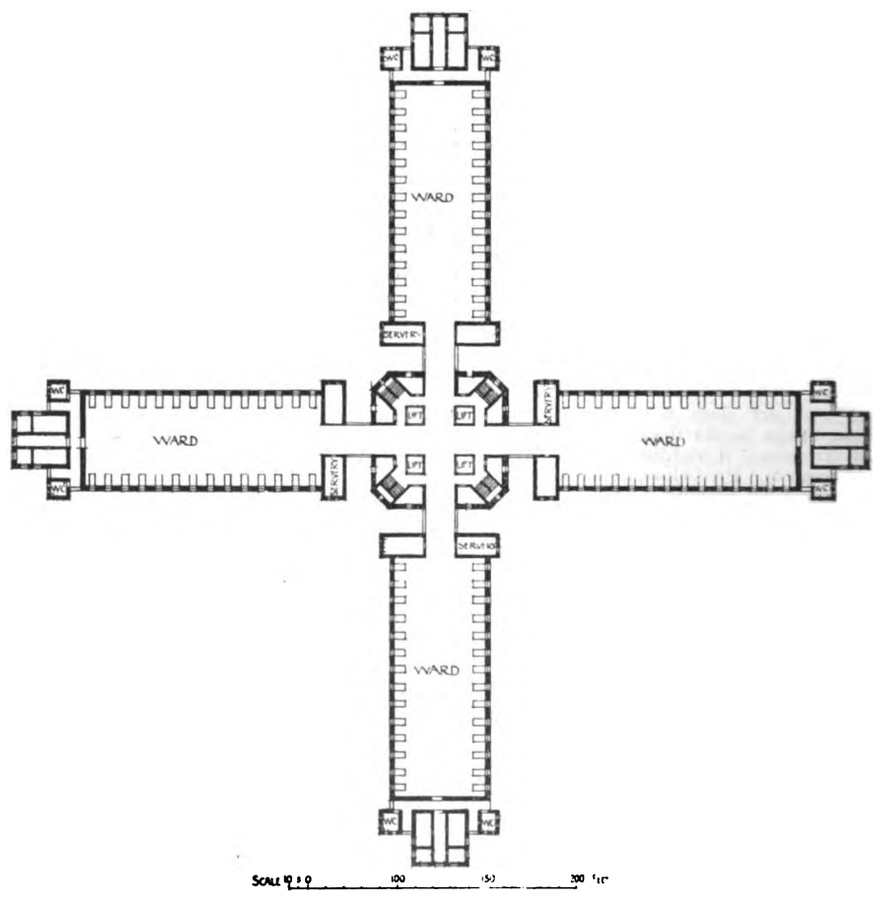
Illustrations.

A CITY TOWER OF HEALING.

THE suggestion upon which this design is based was contained in a letter from Mr. J. Y. W. Macalister, F.S.A., the Librarian of the Royal Medical and Chirurgical Society, to the *Times* a few months ago. He had recently visited New York, expecting to find a dislike to its famous "sky-scrapers" confirmed by inspection; but he wrote: "The result was just the reverse. The more I saw of them the more they fascinated me. Some of them were architecturally faulty, but their huge proportions made me forget architectural canons, and only admire the great bluff cliffs of masonry soaring far above the noise and dust of the surging streets. . . . I was carried to the top of several of them on electric lifts, and found pleasant roof-gardens, where one could sit and lunch, fanned by cool breezes, while below men and horses were panting in sultry heat, and from all enjoyed a magnificent view far into the country or out to sea. . . . In the heart of the city I visited two palatial clubs, each installed in the top floors of one of these towers. The noise of the streets was a pleasant murmur, the rooms were well windowed and full of sunlight, and would have made ideal wards."

A "sky-scraper" would solve the problem of providing an increase of hospital accommodation in a crowded city upon a limited site by a building of exceptional height. The ground and lower floors could be wholly utilised for out-patients' halls and official and administrative purposes, while any street frontages valuable commercially could be sacrificed, as the essential light and air are obtained at higher levels.

The wards would gain progressively in quiet, airiness, and sunlight as the stories ascend. until the fifteenth or perhaps the twentieth floor would be suitable for a loggia for open-air treatment. Ample lift service and detailed administrative accommodation would be obtain-



"A Tower of Healing." Plan.

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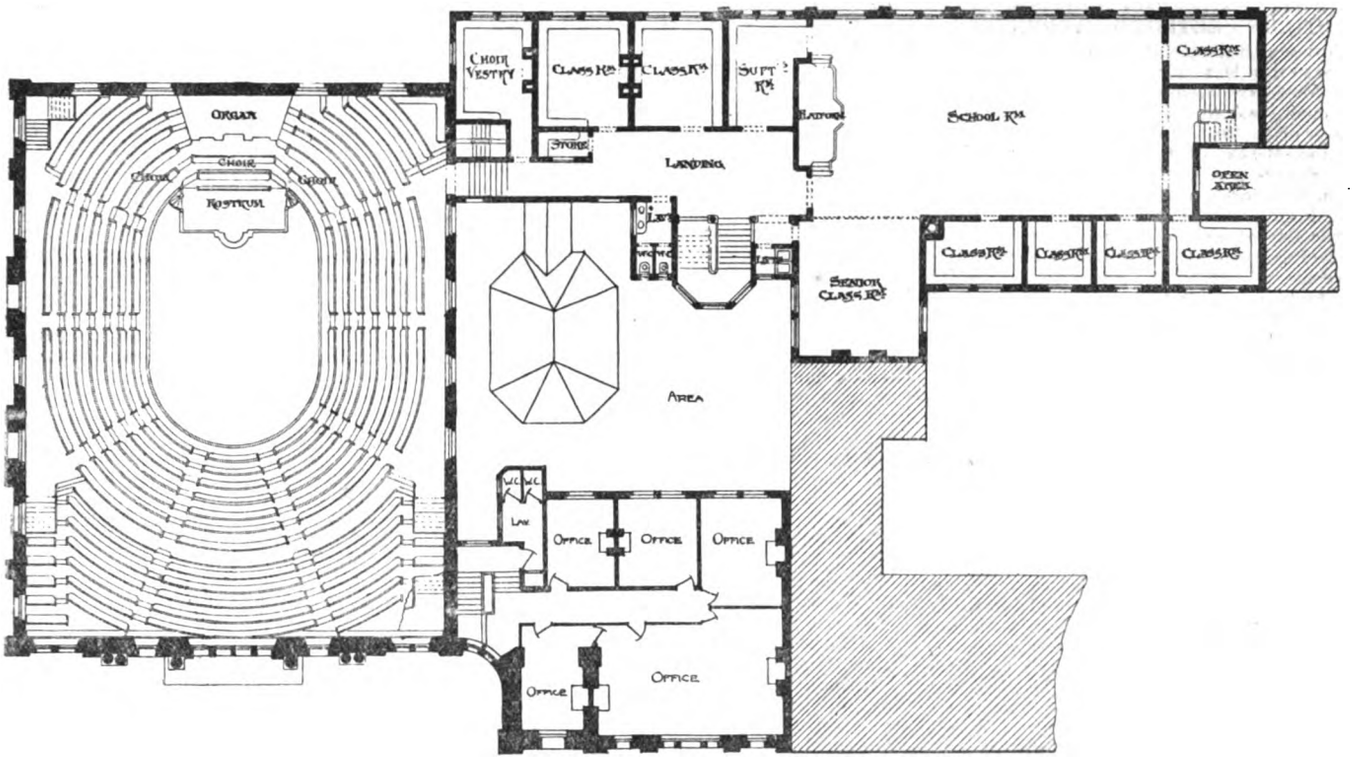

GALLERY AND FIRST FLOOR

Wesleyan Chapel and Schools, Oxford place, Leeds.

able in the central block, which would be continued upwards into a tower to contain the ventilating and smoke shafts which would be grouped in its angles. Operating theatres and sanitary offices and ward kitchens would be placed at the outer ends of each ward block, with practical isolation from the rest of the building.

The architectural treatment of a regular arrangement of lofty windowed blocks detached from and yet grouped around a central tower, would sufficiently express its aim of combining light and healing, even by contrast with the recent interesting experiment in hospital building upon one floor in close formation on an extended site, some possibilities of which were discussed at the Institute meeting last Monday. BERESFORD PITE.

INTERIOR, HOLLINGTON HOUSE, BERKS.

THIS house is a new one, built on the site of a smaller one, near Newbury. The illustration shows the entrance hall, which is carried up two stori s in height, and is panelled in oak, together with all the principal rooms on the ground floor.

The work has been entirely carried out by Messrs. Wheeler Bros., of Reading, from the designs and under the superintendence of the architect, Mr. A. C. Blomfield.

OXFORD-PLACE CHAPEL AND SUNDAY SCHOOL, LEEDS.

THE Oxford-place Chapel buildings occupy a commanding position on the west side of Victoria-square near the Town Hall.

The old Chapel was built in 1834, and on account of its old associations, its large seating capacity, and its good acoustic qualities, also on the score of economy, it was decided to retain it in the building scheme. With the exception of the old shell of the structure it has, however, virtually disappeared. The interior has been remodelled and reseated, and externally it has been recast with new elevational work so far as the principal façades are concerned.

The portion of the building occupied by the tower and the gable end to the right is entirely new. The tower as carried out has been simplified in design, and the attached building has undergone some modification, and its upper stories serve the purposes of a Police Institute.

The Sunday School block is situated to the rear of the site, with its principal frontage to Oxford-row. It takes the place of the old school building, which was pulled down owing to its insanitary condition and lack of suitability in other respects.

The buildings are faced with local red pressed bricks, and stone from the Morley Moor quarries is used for the dressings.

The expenditure upon the whole of the buildings has amounted to about 25,000*l.*

The work has been carried out from the designs and under the superintendence of the joint architects for the scheme, Mr. Geo. F. Danby and Mr. William H. Thorp, both of Leeds.

GREEK ART AND THE PERSIAN ORDER.

THIS plate contains the illustrations to the article by Mr. Spiers on another page, where the sketches are referred to by the numbers figured here.

WHITGIFT'S HOSPITAL OF THE HOLY TRINITY, CROYDON.

THIS interesting range of late XVIth century buildings is again threatened with demolition, on this occasion for a widening of the roadway at the corner of North End and George-street, opposite Crown-hill. The hospital was founded in 1596 by John Whitgift, Archbishop of Canterbury, for a warden, a school-master, and from twenty-eight to forty aged brethren and sisters to be chosen from amongst the household of Croydon Palace, and the poor of Croydon and Lambeth parishes, and of certain parishes in Kent. The building of the hospital was begun on January 17, 1596, and completed on February 29, 1599; the total cost amounting to 2,716*l.* 11s. 11d. The accounts of the work, the weekly payments of the labourers, and the statutes of the foundation are contained in the Lambeth MS., 275. One item cites the making of "the two trenches next the Crown and George Inn," February 4, 1596, and another is: "March 22, 1596, His Grace laid the two corner-stones north and south." A great portion of the timber was obtained from Lingfield and from the Archbishop's park, now Park-hill, and the sand for the mortar from Duppas, formerly Dubbers, Hill, Croydon. The buildings, of brick, are somewhat similar to those of Archbishop Abbott's Hospital, founded in 1619 at Guildford, where, however, the architectural details are more rich; the rooms are upon two floors, with an upper range in the gables; the chapel, which is partly panelled, is on the south side of the court. The labels over the windows in the quadrangle are finely moulded of red brick; the warden's room has a finely-carved mantelpiece, and some of the ancient glass is preserved in the hall. An item in the accounts relates to the glass: "1598. The glazing was finished; the glass in the hall window cometh unto 49*l.* 2s." Great economy was observed in the matter of fittings and furniture, rough knotted oak timber, available, it appears, for no other purpose, was used for the seats in the chapel. About twenty years ago was found in some old chests kept in the hospital a valuable collection of about four hundred legal and similar documents, court-rolls, indentures, etc., concerning the foundation of the charity, its history, and property, covering an interval from the XIVth century to the close of the XVIIth century. A deed of 30 Edward III. and another of 3 Henry V. relate to properties that still appertain to the hospital and its endowment; there were some bearing the founder's signatures and seals, and those of members of his family. Another instrument testifies that on the site now occupied by the hospital stood the Checquers Inn, which was bought for 200*l.* by Whitgift, who also paid 30*l.* for an adjacent house, and 80*l.* for the stay-cross and an adjoining parcel of land. The "find" comprised some curious old drinking-bowls for those seated "above the salt" and "below the salt." In 1880-1 the Charity Commissioners framed a scheme for the future management of the Charity and its revenues; the concurrent charities endowed by Whitgift had been, ten years before that time, extended by an enlargement of the Middle School and the erection of new buildings for the Grammar School in North End, Croydon; some of the old school buildings in George-street being then demolished. Whitgift died on February 29, 1604, having been Primate during twenty-one years; his monument with his effigy in the parish church of Croydon, where he was buried on March 27, was restored in 1888 by the governors of the Charity, and in that year was unveiled a window to his memory. The hospital buildings were repaired fifty-five years ago, but remain in almost their pristine condition as erected in the life-time of their founder and patron. His own set of rooms, including a kitchen, form a curious exemplar of domestic life as in his day.

At their meeting last week the Society of Antiquaries unanimously adopted a resolution in favour of the preservation of "this interesting and beautiful building which still effectively serves the purpose for which it was erected three centuries ago."

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THE INCORPORATED BRITISH INSTITUTE OF CERTIFIED CARPENTERS.

THE annual dinner of this Institute was held on Saturday last at the Holborn Restaurant. Mr. John Wilson, J.P., the President, was in the chair, and among those present were the Master of the Carpenters' Company, Mr. Percy Preston, Mr. W. Busbridge, Mr. Houston, B.A., Mr. Fletcher, A.R.I.B.A., Mr. W. E. Cutter (Hon. Secretary), and others.

Following the usual loyal toasts, the Master of the Carpenters' Company gave the toast of "The Incorporated British Institute of Certified Carpenters." He said it was extremely gratifying to him to know that carpenters took so much advantage of the schools and lectures which were provided by the Carpenters' Company. He was somewhat connected with the carpentry trade himself, for he employed a great many men in the art of carriage-building. There was no doubt that if a body of men combined together and formed themselves into an institute it was an extremely good thing, not only for themselves, but also for the trade. He knew what it was to belong to an institute in his own trade—not of men, but of masters—and he knew that that Institute was of benefit to the trade by giving an opportunity for discussing questions of interest to them, and he had no doubt the members of the British Institute of Certified Carpenters were able to do the same in the trade of carpentry. With the toast he had to couple the name of their President, Mr. Wilson, in whom they had a man who had been most intimately connected with the art of carpentry. He did not know any gentleman who was more *au fait* with the trade, and who grasped the situation more readily than he did. He was certain of this, that on the court of the Carpenters' Company they derived an immense amount of benefit from his advice, and without that advice the court would frequently go wrong in their judgments. It was therefore with extreme pleasure that he proposed the toast.

The Chairman, in acknowledging the toast, said he could assure them it was a great pleasure to him to be there that evening, and to see so many certified carpenters there. He believed that the inception of that Institute arose from the examinations held by the Carpenters' Company, and all the members of the Institute held the certificate of that Company. That association was of very great benefit because it singled out a number of men who were thoroughly capable and who were an honour to the trade which they followed. They would be glad to hear that the examinations at Carpenters' Hall were still going on, and that the number of students increased every year. This year he believed would be a record one as far as regarded entries, and at the last lecture the room was so full that they unfortunately had to refuse admission to some gentlemen who came rather late, though if they had come earlier he doubted whether they would have been able to have accommodated them. He hoped that a very large proportion of those who were submitting themselves for the examination this year would not only pass, but would also join the ranks of that Institute. They would also be gratified to hear that next year the Carpenters' Company were going to hold an exhibition. Most of them were aware of the nature of those exhibitions that they had held in the past. Next year they were going to hold another one, notices of which would soon appear, and if any of the members of that Institute could send in exhibits they would be very grateful to them, and he hoped they would be successful in taking some of the prizes. He saw by the *Journal* of the Institute that the question of forestry was alluded to. It might interest them to know that the Carpenters' Company were taking a great interest in timber-growing, and they were doing all they could to stir up the landowners and the agents and the woodmen to bring about a better state of things in respect to the growing of wood in this country. It was a most serious thing that although they could produce something like ninety per cent. of the wood used in this country, we actually imported five-sixths of that wood. There were hundreds of thousands of acres of waste land in this country all capable of growing trees, including a vast quantity of bog land in Ireland which could be brought into cultivation. Other countries were going very far behind in their supply of wood, and it would become a serious question in the future as to where we should get our wood from. He hoped the Carpenters' Company would be able to do something to arouse the public of this country to the importance of growing wood. It was of great importance to carpenters that they should have a good supply of wood, and it was a very great pity that they should not use homegrown wood instead of the imported product.

Mr. Fletcher, in proposing the toast of the Worshipful Company of Carpenters, reminded them that every member of the Institute must hold the certificate of that Company, and in his opinion a better trades union certificate did not exist. He (Mr. Fletcher) was a believer in trades unionism. He was aware that people who knew nothing about such bodies said they were a curse, and no doubt many of them were run on wrong lines. A trades union should be run on the lines that every man who belonged to it should be a competent craftsman, and when he was he was entitled to a competent rate of pay; but, unfortunately, trades unions generally put the cart before the horse. That being a trades union, they ought to be very thankful to the Carpenters' Company for taking them under their wing, because that Company was really one of the oldest trades unions in existence. Since the action which the Company had taken some years since in instituting lectures and classes, it must always stand at the head of their craft. The last time the members of the Institute dined together, it was at the invitation of the Carpenters' Company, and he was very pleased to think that that night they had the Master as a guest. They looked to the Carpenters' Company not only to know the whole aims and objects of their Institute, but to back them up and help them to go right. He looked forward to the time when the Carpenters' Company would be the leading spirit in the craft. It was founded by carpenters, and so was that Institute, and he hoped it would not fall into the errors of some of the other City guilds and allow men who were in no way connected with the craft to be elected to its body, for by reason of that many of the guilds had been drawn away from the crafts for which they were originally founded. Fortunately, the Carpenters' Company had been in the forefront as regarded the education of carpenters, and within the last fifteen years it had done wonders for the craft. He (the speaker) was a director of their schools at Titchfield-street, and any gentleman who went there and saw the work done in the carpentry classes would be simply amazed. The Company had made a home for their Institute; indeed, but for them it would never have existed, and he was sure they would always continue to help them forward in their work.

The Master, in acknowledging the toast, said it was extremely gratifying to him to hear the Carpenters' Company so well spoken of by those in a position to speak of what it had done, and he thought it augured well for the future of the trade when they saw such a gathering as that, composed of gentlemen who held the certificate of the Company, and he was told that those present represented only about one-third of the members of the society. Altogether 120 held the certificate of the Company, which showed that it was doing something for the craft.

Mr. Dixon, in proposing the health of the honorary members, said that they had as honorary members a number of gentlemen more or less intimately connected with the craft to which they belonged. Among those gentlemen were Mr. Busbridge, Mr. Hutton Freeman, Professor Adams, Mr. Blashill, Mr. Waterhouse, Mr. Mitchell, and Mr. Buchanan, who gave the Institute very valuable help.

Mr. Busbridge, in acknowledging the toast, congratulated the Institute upon the lines on which it was working, and prophesied a successful future for it.

Mr. Hutton Freeman also responded.

Mr. Phillips gave "The Officers and Council," and especially referred to the good work done by Mr. Cutter, the Hon. Secretary, and Mr. Dixon and Mr. Inkpen.

Mr. Cutter, in reply, said that was the first dinner they had held as an incorporated body. Now that the Institute was incorporated, it lay with the members to make it a big thing in the future.

Mr. Inkpen, the Hon. Treasurer, also responded.

The remaining toasts were "The Visitors," "The Dinner Committee," and "The Chairman."

ARCHITECTURAL SOCIETIES.

THE VICTORIAN INSTITUTE OF ARCHITECTS.—The last-received issue of the *Journal* of Proceedings of the Institute of Architects of Victoria, N.S.W., contains the Report of the Council presented at the annual meeting in February last. We learn from this that the number of members is now 108, viz.: One Life Fellow, fifty-two Fellows, four Honorary Fellows, and fifty-two Associates. In the course of the Report it is mentioned that, at the invitation of the Board of Public Health, the Institute was forwarding plans of some of the worst types of existing town-dwellings, that the Board might invite a competition for the best system or systems of ventilating such buildings in a cheap and practicable manner. During the year, the newspapers published an illustration of the postage-stamp which the Commonwealth Government intended to issue. The Council of the Institute considered the design utterly weak and inartistic, and expressed the hope that the stamp would be withdrawn, to prevent their Australian designers being held up to ridicule. Upon receipt of the resolution forwarded by the Council, the Postmaster-General thanked the Institute for its criticism, and added that any design of greater merit submitted to the Department would receive consideration. Fortunately the stamp had not been issued in Victoria. The Metropolitan Gas Co. had approached the Institute, asking for the insertion of a clause in specifications for new buildings, to the effect that the gas-pipes and fittings be tested and approved by the Company's inspector before the work is passed. The engineer of the Company (Mr. R. O. Thompson) met the Council in conference, and the suggestion was well received. In order to bring the subject before members, Mr. Thompson had prepared a paper and drawings for the meeting, and submitted specimens of defective work, taken from various buildings, by way of illustration. The formation of an Architectural Museum in Melbourne has been under consideration by a committee of the Council. Offers of valuable assistance had been received from leading citizens, and it was hoped that the proposal would soon be realised.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of this Society, held at the Royal United Service Institution, Whitehall, on Monday, the 6th inst., Mr. D. B. Butler, President, in the chair, a paper was read on "Railway Surveys and Design in New Countries," by Mr. Percy G. Scott, of which the following is an abstract:—In this paper—which was mainly addressed to the junior members of the Society—the author treated of the location and design of railways in new countries, his remarks being based on personal experience in India and on the Gold Coast. He first discussed the preliminary survey of the line, indicating the instruments, tools, and plant required for the work. He next dealt with the question of labour and the tact required in dealing with it; the means of transport in order to facilitate and expedite work; camps, their selection in regard to the work, and the method of laying them out. Reference was then made to the necessity for carefully studying the physical features and maps of the country through which the line has to pass, and to the importance of making sketches and reconnaissances. Preliminary and detailed survey work was then considered, and the manner of carrying it out for open and mountainous countries was explained. The field work necessary and the method of calculating the waterway for bridges were discussed. The amount of opening to be allowed for culverts and drains, taking into consideration the nature of the country and its effect in influencing floods, was also dealt with. The principal gauges in use on railways in different countries were stated, and the desirability of avoiding a break of gauge wherever practicable was pointed out. The principles underlying the adoption of gradients and curves were stated, and the maximum gradients and minimum curves usually allowable on adhesion railways were given, together with tables showing the maximum gradients and minimum curves on existing railways. The necessary length of straight between reverse curves was pointed out. The author next considered the necessity of showing alternative routes when possible and of giving clearly the advantages and disadvantages of each route with the reasons for finally selecting the line

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proposed. He also described the method of staking out the line and of placing marks on the ground in such a way that the line might be readily found and the different points, such as tangent points, intersection points, and bench marks, easily identified. In dealing with plans and sections and designs for works, the method of preparation and the information necessary for the former, were fully given, whilst a brief outline giving the general requirements for the latter were stated. Under the heads of specification and estimates, the author gave instructions as to what is necessary with regard to the general and detailed description of each class, and item of work, when specifying, and he finally indicated the information required for preparing the estimates for sanction.

COMPETITIONS.

LAMBETH TOWN HALL.—At the meeting of Lambeth Borough Council on Thursday of last week a letter was read from the President of the Royal Institute of British Architects, regretting that he was unable to accept the position of assessor in the Town Hall competition, and nominating Mr. Henry T. Hare, F.R.I.B.A. A motion was passed appointing Mr. Hare assessor at a fee of 100 guineas.

SANATORIUM, BARRASFORD.—The plans of Messrs. Nicholson and Dotchin, architects, Newcastle-on-Tyne, have been selected in competition for an open-air sanatorium proposed to be erected at Barrasford, Northumberland, by the Northumberland Branch of the National Association for the Prevention of Consumption. Building operations will be begun without delay, and when completed the building will accommodate 100 patients in separate rooms, together with isolation hospital, etc.

SHEFFIELD WESLEYAN CENTRAL MISSION.—Mr. E. W. Gibbs, the assessor appointed in this competition, states in his report that none of the designs strictly comply with the conditions, and he should therefore by rights exclude them all; "but considering that the conditions in this competition are unusually numerous, covering four pages of printed foolscap, and relate not merely to the drawings, but to complicated questions of light and air, and to the city by-laws and regulations, and that the competitors have apparently endeavoured to comply, and in most cases have probably thought that they have done so, and further, that the designs have been prepared at much cost to the competitors," he recommends the Building Committee to allow him to include the whole of them in his review. The following is Mr. Gibbs's award:—

"Eight of the designs place the large hall above the level of the street, with the small hall and some of the class rooms under it; and one design, No. 6, places the main floor of the large hall below the level of the street, with the small hall in the building behind it and the class rooms above it.

"For a hall in which so large a number as 2,500 persons are to be seated, and at times a larger number are to have standing space, it is clear that the best and only proper arrangement of levels is one in which the floors are partly above the street and partly below, so as to render the entrances easy and the exits as safe as possible in case of panic.

"For this reason alone Design No. 6 takes a high place, but incidentally the adoption of the lower level of large hall, by necessitating the placing of the small hall at the back and the class rooms above it, has made it possible for these rooms to be lofty and perfectly lighted, and this without placing the level of the class room floors at a great height, being 17 ft. 9 in. above the side entrance in Chapel-walk, only 9 in. higher than the floor of the existing church parlour in which the designs are exhibited.

"In the eight other designs, with few exceptions, the halls and rooms on the lower floor are deficient in light. Of course the deficiency is most where the lower story is placed lowest in relation to the street, as in Design No. 2; but that it is inevitable in any design with rooms under the hall is proved by Design No. 5, where the lower floor is a few steps below George-street, the rooms are 20 ft. high, and where, with abundant windows and some skylights, the rays of light passing over the buildings on the other side of Chapel-walk reach only 19 ft. on to the floor, which is inadequate for efficiently lighting a room of 29 ft. depth from window to back wall, much less so for larger rooms as are shown in some of the designs in this position on the lower floor.

"Unfortunately, Design No. 6 shows some minor defects of planning and construction, as more particularly stated in my description of the design, and the architecture is not worthy of so important a building; but I am of opinion that all these defects can be remedied, and would very naturally be so done in the preparation of the working drawings, whereas any one of the other designs would require some amendments in the preparation of the working drawings, and none of them could be so amended as to compare favourably with the general arrangements and levels of No. 6. In making my award I have also to remember that the nature and extent of the accommodation to be provided were not made conditions of the competition, but were merely suggestive. And further, that the object of the competition is to obtain the best building for the special purpose, and that the designs submitted should be judged as suggestive sketches rather than as carefully elaborated working drawings. After very careful and long consideration, I have therefore to award the first premium to No. 6.

"I award the second premium to No. 1, as having the most excellent large hall at a moderate height above the street and excellent general arrangements, except as to height and light of small hall and the large room in basement, and the incomplete arrangement for the use of the large hall for public purposes without interference with the mission work in other parts of the building.

"I award the third premium to Design No. 4, as the large hall is at a moderate height above the street; there is an exceptionally good small hall, with the most excellent arrangement of corridor and class rooms around it, though some of the latter are not sufficiently high and are dull, and the arrangement for separation of large hall for public purposes is incomplete. Further, to my taste, the exterior design of this building is the most excellent of those submitted."

The names of the authors of the premiated designs are as follows:—1st premium, Messrs. Warrington Son and Dunkerley, of Manchester. 2nd premium, Mr. W. J. Hale, Sheffield. 3rd premium, Messrs. Crouch and Butler, Birmingham.

BATHS AT CLAPHAM.—The Baths and Washhouses Committee of Wandsworth Borough Council reported on Monday that they had decided that the proposed baths at Clapham be erected at a cost not exceeding 5,000*l.*, including baths, fitting up, and all other expenses, and that the assessor be informed that the outlay on the proposed building be limited to 4,000*l.* Further, that six architects, experienced in the erection of baths, be invited to submit competitive designs; that the architect whose design is placed first by the assessor be engaged to carry out the building; and that the five other competitors be paid ten guineas each.

HALIFAX SOLDIERS' MEMORIAL.—A meeting of the Halifax Soldiers' Memorial General Committee was held on the 7th inst. at the Town Hall, Halifax, for the purpose of receiving the report of the Designs Sub-Committee on the designs selected six or seven weeks ago. The sub-committee reported that they had referred the three selected designs to Mr. W. S. Frith, of Chelsea, whom they had appointed to act as assessor. He had informed them that the three designs all complied with the requirements set out in the advertisement, and that the one selected for the monument—that marked "Prom"—could be carried out for the stipulated sum of 1,050*l.* It transpired that the author of the selected design, "Prom," is Mr. W. W. Longbottom, architect, of Hipperholme; while the winners of the second and third premiums are Messrs. John Underwood and Son, of London (who sent in the design "*Non sibi sed patriæ*"), and Mr. Alexander F. Smith, of Grange-street, Keighley (whose design was marked "Excelsis No. 1"). Resolutions were passed to pay the successful competitors the premiums of 25*l.*, 15*l.*, and 10*l.* respectively, desiring the sub-committee to instruct Mr. Longbottom to get out specifications and procure tenders for the erection of the monument.

BOOKS RECEIVED

A MANUAL OF FOREST ENGINEERING FOR INDIA. By C. Gilbert Rogers, of Imperial Forest Service of India. (Government Printing Office, Calcutta. 6s.)

The Student's Column.

ARCHES.—XXIII.

THE falseworks employed for the purpose of supporting arches during construction are called *centres* or *centring*. They are temporary structures of timber or steel, and in their design, erection, and subsequent removal the greatest possible care is necessary.

As generally made, centring consists of a series of frames, usually described as ribs, of which the extradosal surface is shaped to correspond with the curve of the soffit of the arch to be built. The ribs are placed parallel to each other at suitable distances apart, in planes perpendicular to the axis of the arch, and are covered with planks, called *laggings*, laid so as to be parallel to the axis of the arch, and forming a sheeting upon which the arch stones or bricks are directly laid.

The most usual type of centring is constructed so that it can be adjusted in position by driving timber wedges below it and the supports, and afterwards lowered or struck by driving out the wedges. Thus the support can be simultaneously removed from every part of the newly-built arch.

In the improved type of centring first introduced by Sir Charles Hartley the lagging was supported upon the ribs by wedges or other devices so that the support could be removed from the arch stones course by course, and restored if it were found that settlement proceeded too rapidly.

The individual frames of centring may be either solid ribs or trusses of timber, but sometimes they are formed by suitably curved steel beams built up of rolled sections and plates.

In trussed timber centring the members upon which the laggings are placed are termed *back-pieces*. The ends of the ribs may be carried by the shoulders of the abutments, or supported by timber struts abutting against baulks laid upon the ground. The erection and manipulation of the centring is a most important part of arch construction, especially in arches of long span, or in the case of viaducts comprising a series of arches. Every change in the form of the centring due to the weight of the materials of the arch ring, is necessarily followed by a change in the form of the arch curve and a corresponding alteration in the position of the line of resistance.

A certain amount of change must obviously be caused in all centring when fully loaded, but given proper strength and stiffness the alteration of form should be so small as to produce very little effect on the stability of the arch. By reference to Article XXI., it will be seen that the depression at the crown of the Plauen viaduct was less than 1 in. in a span of 295 ft., or about $\frac{1}{3\,1\frac{1}{2}0}$th of the span. In this case the centring was of particularly rigid construction, and steps were taken to determine the amount of the depression before the arch ring was finally keyed up. The last-mentioned precaution is not usually taken when small arches are being built, but the method of construction involved is certainly advantageous for all arches of considerable span, as the designer is thus enabled to judge before the completion of his work how far the calculated conditions are being realised.

It should be particularly observed that excessive deformation of the centring, due to inadequate strength, or improper bracing resulting in insufficient stiffness, may involve such alteration in the line of resistance as will endanger the stability of the structure.

Further, the centring must not be struck until the solid backing has been completed and until the mortar has set sufficiently. Moreover, when an arch forms one of a series, none of the centres must be struck in such a manner as to leave any pier with an arch abutting against one side of it, unless the pier is an abutment pier, which has been designed (as explained in Article XVIII., p. 497) so as to permit it to act as an abutment. The disastrous results that may follow the removal of centring before the mortar is thoroughly set are clearly illustrated by the recent collapse of a railway viaduct in Gloucestershire.* The same disaster incidentally exemplifies the effect caused by the unbalanced thrust of an arch against a common pier.

Whatever general method may be adopted in building an arch, the work ought to be so conducted that the work on the centring may never be sensibly unsymmetrical. When building is conducted in the ordinary manner the voussoirs should be laid progressively from both ends. The loading on the centring will thus be increased as the middle is reached, and its maximum effect will be produced when the arch ring has been completely laid with the exception of the keystone.

If no friction existed between the arch stones, the load imposed upon the centring could be exactly determined, but friction between the arch stones, and between them and the centring, makes it impossible to compute the load with any degree of certainty by mathematical formulæ.

It is usual to consider that the voussoirs do not commence to exert pressure against the centring until the work of building has been so far advanced from the springings that the slope of the bed joints is greater than that of the angle of repose, or about 30 deg. In order that this condition may be fulfilled, however, the lower part of the arch must be of such thickness that it will have no tendency to overturn in an inward direction. Rankine considers † that a thickness equal to about one-tenth of the radius of curvature of the intrados is in general sufficient for that purpose,

* The *Builder* Vol. LXXXV., p. 541; Vol. LXXXVI., p. 50.

† "Civil Engineering," p. 486.

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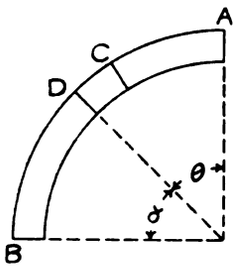

Fig. 96.

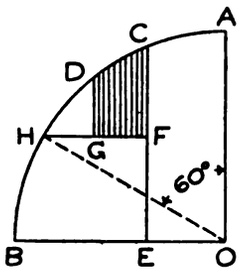

Fig. 97.

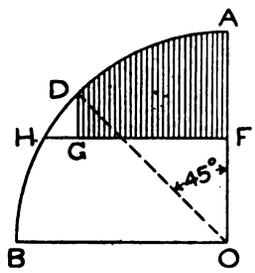

Fig. 98.

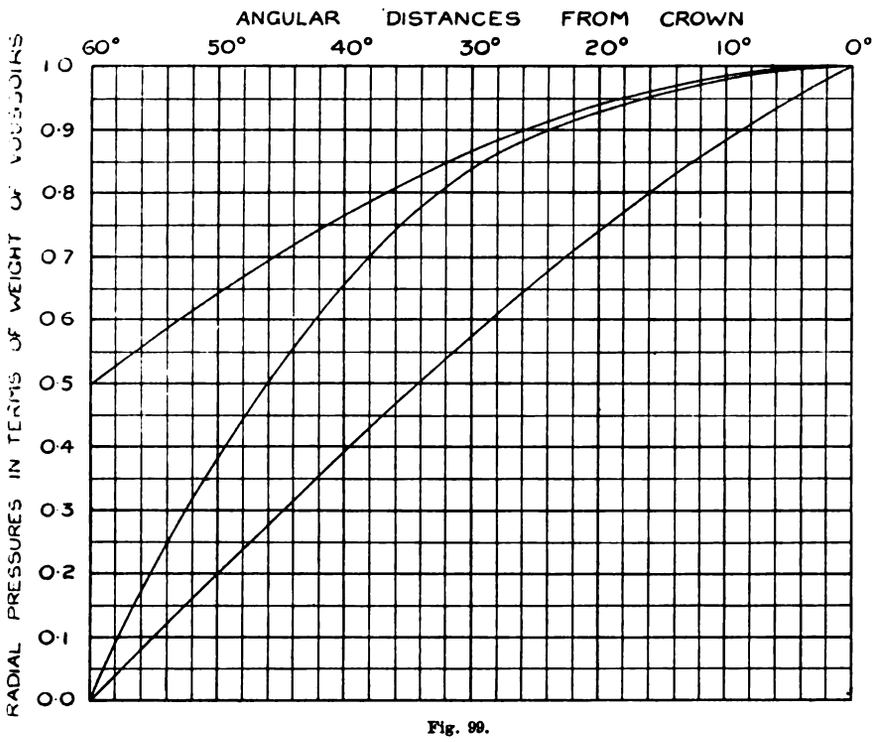

Fig. 99.

but it should be remembered that any accidental disturbance of the arch stones may cause them to exert pressure against the centring.

Every successive course of arch stones laid causes a diminution of the pressure exerted on the centring by preceding courses of the masonry, and, when a semi-circular arch has been completed with the exception of the keystone, the voussoirs whose bed joints have a slope of less than 30 deg. have ceased the pressure against the centring, and this would be true even if there were no friction. As a matter of fact, when the maximum load on the centring has been attained, its action is not materially affected by the presence or absence of friction. Taking this consideration into account, and also the fact that any errors in computation resulting from neglect of friction, must be on the side of safety, it is sufficient for practical purposes to disregard the effect of friction altogether.

As it happens, knowledge of the exact load on the centring is not essential, for the construction is of purely temporary character, and the employment of an excessive amount of timber for the sake of insuring the requisite strength and stiffness does not involve appreciable waste, as the greater part of the material can be again employed for similar purposes. Consequently, the loads may be assumed at a much higher value than their probable amount. Due allowance should also be made for the concentration of materials deposited on the centring to facilitate the work of the arch builders, as well as for shocks and vibrations incidental to the work of erection.

The following rules may be applied for determination of the pressure upon the centring:—

Let a = the angle made with the horizontal by a joint, as D (Fig. 96);
f = the co-efficient of friction of the material;
θ = the angular distance of any point from the crown;
W = the weight of a voussoir, as C D (Fig. 96);
P = the normal pressure on the centring due to a voussoir, as C D (Fig. 96).

Disregarding friction, the voussoir C D in the semi-arch A B (Fig. 96) must evidently be supported by the normal resistance of the surface D and the radial reaction of the centring. The pressure on the surface D is then W cos a, and the pressure in the direction of the radius is W sin a.

Taking friction into account, we find that part of the weight of the voussoirs may be transmitted to the abutment through the arch ring or through the centring. Both of these will offer frictional resistance equal to the product of the perpendicular pressure and the co-efficient of friction, for this co-efficient indicates the friction per unit of pressure perpendicular to the surfaces in contact.

Hence, if the normal pressure on the joint D is W cos a, the frictional resistance is f W cos a. Frictional resistance in the joint D must decrease the pressure on the centring by an equivalent amount, and, taking into account friction on the joint D, the radial pressure on the centring becomes:—

$$P = W (\sin a - f \cos a).$$

But, as the frictional resistance between the voussoir and the centring must decrease the pressure upon the joint D, the value of P, as given by the foregoing equation, cannot be correct. Thus it becomes clear, as stated above, that the effect of friction is to render mathematical determination somewhat uncertain.

By neglecting friction between the voussoirs the radial pressure on the centring is:—

$$P = W \cos \theta.$$

In applying these formulæ to practice it must be borne in mind that friction between the voussoirs is at a minimum at the crown, increasing with the angular distance from the crown, and at 60 deg. from the crown—*i.e.*, 30 deg. from the horizontal—the voussoirs may be regarded as self-supporting. Consequently, the rule P = W cos θ is approximately correct for the crown load, but gives values that are too high for other parts of the curve and the excess of value increases in an increasing ratio with the angular distance from the crown. The rule P = (sin a − f cos a) is similarly correct at the crown, but gives values that are too low for other parts of the curve, and the deficiency of value increases in an increasing ratio with the angular distance from the crown.

In Table XI. we give radial pressures in terms of the weight of the voussoirs, W being taken at unity. The values are calculated by both the above formulæ, for different angles measured from the crown. For office use it would, of course, be convenient to calculate pressures for every degree from 0 deg. to 60 deg. from the crown. For approximate guidance, it may be said the values in column 2 ought certainly to be used between 0 deg. and 30 deg. out from the crown, the values in column 1 may then be applied between 30 deg. and 60 deg. from the crown, and beyond that distance the voussoirs may be considered self-supporting. The adoption of this practice would have the disadvantage that two widely different values are obtained for the angular distance of 30 deg. from the crown, and, bearing in mind the fact that the values in column 1 are too low and those in column 2 too high, it is better to take interpolated values.

The most convenient method for arriving at such is by means of a diagram. Fig. 99 contains three curves, of which two have been plotted from the values in Table XI. The top curve represents the values in column 2, the bottom curve those in column 1, and the middle curve is interpolated so as to give ample values for the first 30 deg. out from the crown, then dropping sharply to meet the bottom curve at 60 deg. Values for any required angle can readily be read off from these curves, and the interpolated values in column 3 of Table XI. have been taken from the middle curve in Fig. 99.

TABLE XI.—RADIAL PRESSURE OF THE VOUSSOIRS ON CENTRING.

Angular Distance from the Crown.	Radial Pressures in Terms of the Weight of the Voussoirs W = 1. Co-efficient of Friction f = 0·58.		
Degrees.	W (sin a − f cos a).	W cos θ.	Interpolation from Curve in Fig. 99.
60	0·000	0·500	0·000
58	0·038	0·529	0·095
56	0·078	0·559	0·175
54	0·118	0·587	0·250
52	0·158	0·615	0·319
50	0·198	0·642	0·384
48	0·238	0·669	0·448
46	0·277	0·694	0·520
44	0·316	0·718	0·556
42	0·355	0·743	0·607
40	0·393	0·766	0·654
38	0·430	0·788	0·703
36	0·458	0·809	0·742
34	0·504	0·829	0·779
32	0·504	0·848	0·809
30	0·576	0·866	0·840
28	0·610	0·882	0·865
26	0·644	0·898	0·880
24	0·677	0·913	0·900
22	0·709	0·927	0·915
20	0·741	0·939	0·927
18	0·771	0·951	0·940
16	0·801	0·961	0·951
14	0·829	0·970	0·962
12	0·857	0·978	0·971
10	0·884	0·984	0·978
8	0·878	0·990	0·985
6	0·931	0·994	0·991
4	0·957	0·997	0·995
2	0·979	0·999	0·998
0	1·000	1·000	1·000
	(1)	(2)	(3)

Each of the values in the column of Table XI. selected for use, when multiplied by the weight of the arch resting on 2 deg. of the centring, gives the radial pressure upon the corresponding part of the centring. Similarly, the pressure upon any longer arc of the centring can be found by taking the sum of the values stated in the selected column for the given arc, and multiplying it by the weight of the arch resting on 2 deg. of the centring.

The following is a graphical method of determining the radial pressure on any arc of the centring of a circular arch:—

Let A B (Fig. 97) be a quadrant described about the point O with the radius O A equal to that of the intrados of the arch. Let C D represent the arc for which it is required to find the load on the centring, and assume that half the radius O A represents w, the weight per foot of intrados.

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From the point C draw the line C E parallel to A O, bisect C E, and from F, the point of bisection, draw F H parallel to O B, also draw D G parallel to A O. Then D G will represent the normal pressure p on each lineal foot of the centring at the point D, and the area C D G F will represent the amount and distribution of the vertical component of the load on the centring between C and D.

The point H, being at the angular distance of 60 deg. from the crown is, that below which the arch stones may be considered as self-supporting.

Again, to find the load on an arc of the centring extending from the crown A to any point D, as in Fig. 98, bisect the radius A O in F and let A F represent w, the weight per foot of intrados. Draw F H parallel to O B, and D G parallel to A O. Then, as before, D G will represent the normal pressure p on each lineal foot of the centring at the point D. The area A D G F will represent the amount and distribution of the vertical component of the load on the centring, and if the springing is situated at D the area A D G F will represent, of course, the entire vertical load on the left half of the centring.

COURT OF COMMON COUNCIL.

THE usual fortnightly meeting of the Court of Common Council was held at the Guildhall on Thursday last week.

On the motion of Mr. A. C. Morton, a report was received from the Streets Committee on the reference of March 24 last in regard to the fire at Duke's Head-passage, Ivy-lane, and as to the promotion of a Bill in Parliament empowering the Corporation to inspect all buildings and require all owners to provide proper means of exit through the roof by fixed ladders and other means of escape. The report stated that the Chairman of the Committees of the House of Lords could not give any hope that the Bill, if introduced, would be allowed to proceed, and the Committee therefore recommended that, under the circumstances, no further action be taken in the matter this Session. After some discussion the recommendation was agreed to. The Committee submitted a list of the posts which have been removed from the public ways with a view of facilitating the work of the Fire Brigade.

The same Committee recommended that the regulations as to the synchronising of clocks in the City be made retrospective, and this was agreed to. It was agreed also to allow a rearrangement of the line of footway in connexion with the improvement in front of Nos. 3 and 4, St. Paul's-churchyard.

A letter was received from the London County Council asking the Corporation to appoint two representatives to attend a Conference of Metropolitan Borough Councils, to be held on July 7 at the County Hall, Spring-gardens, relative to the Public Health (London) Act, 1891. The letter was referred to the City Lands Committee.

Among other correspondence were several communications from various authorities dealing with the Valuation Bill, and a letter from the Clerk to the Conference of Representatives of Local Authorities within the London telephone area, with reference to the proposed purchase by the Government of the National Telephone Company's undertaking, enclosing several resolutions passed at the Conference.

LONDON TRAFFIC COMMISSION.

THE Royal Commission on London Traffic resumed its sittings on Thursday last week, when evidence was given by Sir Homewood Crawford, the City Solicitor, who dealt with the powers possessed by the Corporation in the matter of the regulation of traffic in the City. Referring to the City Police Force the witness stated that, out of a total force of 1,061 officers and men, 266 were told off for traffic regulation in the City. In its capacity as local authority under the Tramways Act, 1870, the Corporation had always successfully resisted the introduction of tramways within the City area. The City was really a huge terminus, rather than a mere highway for through traffic. Owing to its narrow and crowded streets, if the introduction of tramways was permitted, it would be exceeding difficult, if not impossible, to regulate the traffic in the event of a sudden outbreak of fire; and also on occasions of Royal and public processions. Work in connexion with tube railways within the City was always required to be done under the supervision of the City Engineer. The question of the opening of the streets was still on an unsatisfactory footing, and the Corporation felt that full power should be given to deal with the matter.

Mr. Abraham Charles Ellis, General Manager of the Metropolitan Railway Company, was then called. Having outlined the history of the line, he proceeded to deal with the work of electrification now being carried out. The electrification of that railway was being carried out under difficulties which would be absent in the case of a new electric railway. The company's generating station had been built on land at Neasden, adjoining their engineering works. It would be, when completed, the most extensive power station in the kingdom owned by a single railway company. The main building was 318 ft. long by 101 ft. wide. In the engine-room three large turbo-polyphase alternators were being erected, each having a capacity of 3,500 kilowatts, equal to about 14,000 h.p., and capable of supplying 17,000 h.p. to the track during periods of heavy traffic. Provision had been made for the erection of extension units to meet future demands for power, and probably a fourth unit would be installed at once. The steam for driving the alternators would be supplied by ten large tubular boilers, each having a capacity to evaporate 20,000 lb. of water per hour to a steam pressure of 180 lb. per square inch, and also superheated to a total temperature of 520 deg. Fahr. The three-phase alternators would generate directly 11,000 volts across each phase, and at that voltage the current would be transmitted by three-core armoured cables to nine sub-stations on the railway. At the sub-stations the high-voltage current would be transformed by a static transformer to 440 volts, a suitable voltage for the rotary converters, which will convert the alternating current to continuous current for traction use at 600 volts. Positive and negative conductor rails, efficiently insulated, would be used. The new rolling stock would be entirely of English manufacture, and of the open corridor type. The cars would be 52½ ft. long and 8 ft. 9 in. wide, with transverse and longitudinal seats, the entrances being at the ends. So far as possible the cars would be made fireproof, and all precautions would be taken with regard to the electrical apparatus to guard against fire. From the rail level to the waist of the cars the construction would be entirely of metal, the floor being of iron, covered with asbestos, and the underframe and seats and seat supports being of steel. The cars would be encased in steel to the light bottom rail, and a minimum of timber would be used. In the motor-cars the cables would all be carried in Calmon's asbestos slate casings, and no power cables would be carried through the trailer cars. It was proposed to make up trains of six cars, with motor-cars at each end, the combined motors having a normal capacity of 1,200 h.p., and being worked in series and controlled from either end of the train. Each car would be fitted with the Westinghouse brake. The cars would be of two classes, different only in the interior decoration and upholstery. Altogether the company were spending over 1,250,000*l.*, which sum would be increased if additional machinery were needed.

On Friday the final sitting of the Commission was held. Evidence was given by Mr. Edgar Speyer, who contradicted certain statements made by the London County Council witnesses with regard to the position of the Underground Company and the various tube lines connected with it.

Mr. Clifton Robinson, the Managing Director and Engineer of the London United Electric Tramways was then called.

Witness dealt at great length with the history of the London United Electric Tramways, from the formation of the company, in 1894, down to the present time. There were now thirty-six route miles in operation; thirty-eight additional miles had been sanctioned, and five further miles passed this Session by a House of Commons' Committee. He then proceeded to a consideration of the present methods of Parliamentary procedure in Private Bill matters, which he regarded as somewhat unsatisfactory. In reply to Sir D. Barbour, he said that he was strongly in favour of the formation of a tribunal to deal with London traffic matters; but such a body was not to be formed hastily. When realised, it should concentrate within itself the best available talent. The number of members should be limited to five, and they should be appointed for a certain number of years, and sit the year round, and not only during the Sessions of Parliament. The special junction of the Tribunal should be to go fully into the details of a proposed scheme, and, by so doing, anticipate a large amount of the technical and routine work now done by the Committees. An inquiry before such a Tribunal should take the place of the veto possessed under Standing Order No. 22; or if this could not be, then some means might be taken by which the enforcement of a Standing Order should rest with the Committee dealing with the Bill. He was not in favour of the London County Council or the Corporation of the City having any exemption from the authority of the new Tribunal.

OBITUARY.

MR. ROYLE.—We have to announce the death of Mr. William Alfred Royle, aged sixty-four years, of 17, Cooper-street, Manchester, and Sparthfield, Heaton Norris, senior and surviving partner of the firm of Messrs. Royle and Bennett, of Manchester. Mr. Royle was elected a Fellow of the Royal Institute of British Architects in 1888, and had served as a representative member of the Council. He was elected President of the Manchester Society of Architects, 1888-9, a member of the Council of that Society in April, 1902, and a Vice-President for the session 1903-4. Of the more important architectural works recently carried out by the firm, we may instance the following:—Warehouses and business premises in Mount and Lloyd streets, Manchester, and the improved approach into Albert-square; the schools in Moston-lane for the Manchester School Board; and the Queen Victoria Memorial Church in St. Luke's parish, Eccles New-road, Weaste. They were architects of many other schools and buildings for the Manchester School Board, comprising the offices in Deansgate and the Higher Grade Schools at Cheetham. Mr. Royle acted as professional adviser and assessor in several important competitions, including those for the Board Schools in Accrington-road, Blackburn; the St. Matthias Schools for the Salford School Board; and, in conjunction with his late partner, the Heaton Norris District Council Public Offices, and the Constabulary Offices at Warrington. Mr. Robert Isaac Bennett, F.R.I.B.A., who was his partner during a long period, died in August, 1901.

MR. JOHN KELLY.—We have to record the death, at the age of sixty-four, of Mr. John Kelly, head of the firm of John Kelly and Son, architects, of London. Mr. Kelly was born in Scarborough, where he received his education, and was articled to a Mr. Petch. He then went to Kington, in Herefordshire, and afterwards to Mr. Taylor's office in Manchester, where he met the late Mr. William Young; but, being ambitious and anxious to come to London, answered an advertisement, and was surprised to find, in reply, that it was from George Edmond Street, whom he served, together with J. D. Sedding, for three years, leaving, however, at the request of Mr. Adams, whom he took into partnership, to start a practice for himself in Leeds, where he obtained his first chance in the form of a church at Hull, which he won in competition. He afterwards became School Board Architect for Leeds, a post which he held for about twenty years, but left to practise in London. Mr. Kelly has done a considerable amount of work throughout the country, including numerous schools, flats, houses, hotels, and over fifty churches, some of the most important being St. Patrick's, Soho-square; St. Patrick's, Leeds; All Saints' Church and Church-room, Petersham; Church of St. Agatha, Kingston-on-Thames; All Saints', South Acton; Emmanuel Church, Leeds; St. Luke's, Kingston-on-Thames; All Hallows, Leeds, etc. The practice will be carried on by his son, Mr. Claude Kelly, who had been in partnership with him.

GENERAL BUILDING NEWS.

IMPROVEMENTS TO THE CATHEDRAL, FERNS, IRELAND.—On the 30th ult. the cathedral at Ferns was dedicated after having been improved and restored. A chancel has been added, and the ceilings, flooring, and seating accommodation have been renovated. The contract for the improvements was carried out by Mr. Webster, of Gorez, from the plans of Mr. J. F. Fuller, architect.

RESTORATION OF ST. CLEER CHURCH, CORNWALL.—The restoration of the parish Church of St. Cleer is being carried out from plans prepared by Mr. Fellowes Prynne, of London. The restoration includes the laying of a floor of Delabole slate on a concrete foundation, and a surface of wood blocks. The aisles will be laid with diamond-shaped slates. The pews, which in the past were of the square box pattern, have been removed, and portions of them are being utilised as a dado around the building. In the restored building chairs will be mainly used. The south wall has been stripped, and will be again plastered, whilst eighteen panels of saints and angels will be introduced. The pillars have been underpinned with a bed of concrete. During the progress of the work several interesting relics have been brought to light. Underneath the old plaster the north wall was found to be covered with texts and frescoes, which were past restoration. In the south wall, near the main entrance, a holy-water stoup was found, and under the plaster at the east end of the same wall an old piscina, filled with stones, amongst which was a gilt alabaster figure, supposed to represent St. Peter in chains, supporting another figure, was discovered. In the south-west wall a portion, on being

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removed to make room for a larger window, brought to light the head of a fine old Cornish cross, pierced and beautifully carved. The shaft is missing, but it is intended to find a place for this interesting relic in the church. Remains of an old screen near the chancel have also been discovered, together with several mullions. The woodwork of the approach to a gallery at the west end has also been discovered beneath the plaster. The chancel will continue to be on a higher level than the nave floor, and a new granite step has been placed with a projection for the lectern. Upon this step a carved-wood rood-screen, 10 ft. in height, is to be erected. The roofs over the nave and aisles have been found to be in a good condition, but the nave roof is to be replastered, and the four old clerestory windows taken out, whilst the west end of the roof has been raised so as to show the granite belfry arch. In the chancel roof the pitch-pine ribs are being replaced by oak, and beneath each joint at which the ribs join the wall-plate angels will be placed, with carved bosses where the cross and longitudinal ribs intersect. A Polyphant piscina has been added to the sanctuary, and a new carved oak chancel-arch is to be placed in position. The font has been removed to the west end of the nave, near the belfry. The vestry is to be converted into a Ladye Chapel, for use at weekday services. It is estimated that the cost of restoration will be about 2,000*l*.—*Western Morning News*.

CHURCH, ST. COLUMBA, DRUMCONDRA.—A public meeting was held on the 29th ult. in the new parochial Church of St. Columba, Drumcondra, to receive a report on the work already executed. The outside walls of the aisles on both sides have been completed for some time past, and are ready to receive the roofing timbers as soon as the clerestory walls are a little further advanced. One side of the nave arcade and portion of the other, consisting of plinths, vases, annulets, shafts (in two heights), and caps in selected Portland stone, with heavily-moulded Bath stone arch, are almost completed. The tower, which will reach a height of 76 ft. from the ground line, before the spire will begin, is now built to a height of nearly 60 ft. The church is Romanesque in style. The front doorway is surmounted by arcading, both the doorway and arcading being in Irish limestone. The rose window over the arcading is about 17 ft. in diameter. The turret will, when completed, rise to a total height of 78 ft. The entire external work is carried out in co. Dublin rock-faced granite ashlar in courses, whilst the dressings to doors, windows, and other ornamental portions of the work are in chiselled Irish limestone. The length from the front of the church internally to the face of the apse is 170 ft., whilst the width of the aisles is 65 ft. 6 in., the width across the transepts is 102 ft. 6 in., and the height from floor to ridge will be 64 ft. The entire work has been carried out by Messrs. William Conolly and Son, of Dublin, from designs prepared by Messrs. Ashlin and Coleman, architects, Dublin, under whose supervision the work is progressing.

CHURCH, INCHINNAN, N.B.—The memorial stone of the new Parish Church of All Hallows was laid at Inchinnan recently. The new church consists of a nave, with north porch and north and south transepts, vestry, etc., and is built of grey stone from Grange Quarry, Blackpasture, Northumberland, and Whitespot Quarry. The nave, which measures 71 ft. long by 39 ft. wide, is about 38 ft. high to the apex, with an open roof. It is lit from the sides by nine two-light traceried windows. The walls are panelled with work to a height of 5 ft. 6 in., and above that they are lined with red Hampshire bricks with bands of stone at intervals. From the crossing of the nave and transepts rises a square tower. It is carried on heavy stone piers, and through these the stone vaulting rises to a height of about 37 ft. from the floor. A circular aperture is left in the space through which bells may be elevated into the belfry. The tower has only been carried to the belfry stage at present, the completed design showing a high-crowned steeple. The cost of the work carried out so far will, it is estimated, be not less than 20,000*l*. The architect is Dr. Rowand Anderson, Edinburgh.

NEW CHURCH, BLACKHALL, N.B.—The Church of St. Columba, Blackhall, was recently dedicated. The building stands on a site on the Queensferry-road, near Craigleith. When completed it will accommodate 900 persons, and will have large halls, vestries, etc., attached. The portion completed at present consists of the nave and apse, with the north aisle and chapel, and the lower stages of the tower. The cost will be about 5,000*l*. The work is Norman in style; the interior is of dressed white stone, and the roofs are of timber, open to the ridges. The architect was Mr. P. Macgregor Chalmers, Glasgow.

PRESBYTERIAN CHURCH, HOVE.—The newest addition to the places of worship in Hove is the Presbyterian Church of England Hall, at the corner of Holland-road and Cromwell-road. The large hall and class-rooms are now practically finished, and the erection of the church proper will be commenced when the accommodation for worshippers in the large hall becomes inadequate. The cost of the completed buildings is 4,500*l*., while the total cost of the church and halls will be about 10,000*l*. The building is of red brick with stone facings, and is in the Early Gothic style. There are two floors, the large hall in which it is proposed to hold services being on the upper floor. Its dimensions are 50 ft. by 30 ft., and it is capable of seating 250 people. At the rear of the hall are a committee-room and vestries. On the under floor is a smaller hall, 30 ft. by 27 ft., which will seat 100 persons, and there are also class-rooms, cloak-rooms, kitchen, lavatories, etc. The architect is Mr. Henman, of Croydon, while the builders are Messrs. W. A. Field and Co., Brighton.

NEW METHODIST FREE CHURCH, SOUTH SHIELDS.—The foundation-stone of the proposed Methodist Free Church and school-rooms, at Westoe, South Shields, was recently laid. The new buildings will be erected on a site at the corner of Birchington-avenue and Oxford-street, and the entrance to the church will be from the latter street. The buildings will comprise vestries, classrooms, and a large hall, to be used for Sunday school purposes, the entrance to which will be in Birchington-avenue. The total sitting accommodation in the church will be for 420 persons, and the schoolrooms will accommodate 400. The total cost of the work, exclusive of the site, will be 4,200*l*. The contractors are Messrs. W. J. Robertson and Sons, and the architect Mr. Geo. Smith, of South Shields.

CEMETERY CHAPEL, CROMER.—A chapel has been erected in the cemetery at Cromer, from the designs of Mr. A. F. Scott, architect, of Norwich and Cromer. The building is in the Early English style, and is built of red brick, with Ancaster stone. The covered entrance is surmounted by a tower. The interior shows a pitch-pine roof, mosaic floor, and oak seating. The chancel is arched, and has two doors, one leading into the vestry, and the other opening on to the drive outside. The windows are lead-glazed throughout. Mr. B. Porter, of Cromer, was the contractor.

WESLEYAN CHURCH, BEAMISH, NORTHUMBERLAND.—The opening of the new Wesleyan Church at Beamish took place recently. The new structure accommodates 450 persons. Alterations have also taken place in the old church, which has been converted into a school hall. The exterior design is Early English in character, and is executed in stone. The interior fittings are of pitch-pine, stained and varnished. The contract has been carried out by Mr. William Hall, Bensham, Gateshead, who has also supplied the seating; the leaded glass by Messrs. Thompson and Snee, Gateshead; and the heating and gas fittings by Messrs. J. Rowell and Co., Newcastle. The plans were selected in competition, Messrs. Marshall and Tweedy's designs being chosen, and under their supervision the works have been carried out.

NEW METHODIST CHURCH, BIRMINGHAM.—The Methodist New Connexion Church in Dudley-road, Birmingham, was opened recently. The style of the new building is Early English. There is a spire at the side of the church rising to a height of 75 ft. The outside is faced with selected red bricks and terra-cotta dressings, and the inside is of rough stucco plaster which can be afterwards decorated, and of terra-cotta arches and dressings. The body of the church has been so designed that there are no pillars. At the Dudley-road end is a small gallery, which only projects a few feet over the body of the church. The pulpit and rostrum are of blue York stone, and the pulpit has a carved stone front and balustrade, supported on marble columns with carved stone caps. At the back of the rostrum, divided by a low, pitch-pine screen is the choir, which is arranged with sloping seats facing the congregation, and at the back of this is a mullioned window with leaded lights. The organ-chamber is arranged on the left of the church at the side of the choir. There is accommodation for about 500 persons, and the total cost of the building is a little over 4,000*l*. The architect is Mr. J. G. Dunn.

NEW PRIMITIVE METHODIST CHAPEL, WINFARTHING, NEAR DISS.—The foundation-stones of a new Primitive Methodist chapel at Winfarthing, near Diss, were laid recently. The plans for the new building were prepared by Mr. H. Winkworth, Ipswich, and the contractor is Mr. Eadon J. Smith, of Bunwell. The contract price of the new building is 225*l*., and the seating capacity will be from eighty to 100 worshippers.

PARISH HALL, PRUDHOE, NORTHUMBERLAND.—The opening of the new Parish Hall, at Prudhoe, took place recently. The building has been erected on a site on the main road, and adjoins the vicarage and church. It is a one-story building, and contains a hall, and there are two anti-rooms near the entrance, together with a kitchen and committee-room. The total cost of the building, including furnishing, was 1,600*l*., and the architect was Mr. S. D. Robins, Newcastle and Sunderland, whilst the contractors were Messrs. G. Watson and Sons, Stocksfield. The plumbing and heating had been executed by W. Scott and Sons, Newcastle and Jarrow, and the painting and glazing by Watson and Charlton, Stocksfield.

WESLEYAN SCHOOL-CHAPEL, KNOWLE, BRISTOL.—The memorial stones of a new Wesleyan school-chapel were laid at Upper Knowle on the 1st inst. A church with tower and spire, and accommodation for 700 persons, besides a lecture hall, vestries, etc., are included in the complete scheme. On the building at present being erected are comprised a school-chapel, 50 ft. by an average of 40 ft., with transepts available for use as class-rooms; also an infant school, a church parlour (capable of division into two class-rooms), and four other class-rooms. Provision will also be made for tea meetings, library, etc. In the school-chapel there will be accommodation to seat 250 adults. The buildings are being erected in pennant stone with Bath stone dressings, and the roofs will be covered with red Broseley tiles. The architects are Messrs. La Trobe and Weston, and the builder is Mr. C. A. Hayes.

WESLEYAN SCHOOL-HOUSE, BENTON, NORTHUMBERLAND.—The foundation-stones of the new Wesleyan school-house in Forest Hall-road, Benton, were laid recently. The building, which is capable of accommodating 250 persons, will have three vestries on the ground floor, and meeting-room and other vestries on first floor, with cloak-rooms, etc. The buildings are to be built of stone, and the architects are Messrs. Marshall and Tweedy, Newcastle, whose designs were selected in competition. Mr. Rowell, contractor, Newcastle, carried out the work.

SPINNING MILL, PRESTON.—It is proposed to erect a new spinning mill on the Knowles estate, off New Hall-lane, Preston. The plans for the building have been prepared by Messrs. Potts, Son, and Hennings, architects, Bolton. Provision will be made for 100,000 spindles, and the cost will work out at about 22s. 6d. per spindle.

EXTENSIONS TO BUSINESS PREMISES, BELFAST.—The alterations and extensions of the premises of Messrs. W. W. Cleland, Ltd., in Durham-street, Belfast, have now been completed. Mr. William Gabbery, builder, carried out the work under the supervision of the architect, Mr. W. J. Fennell.

REHOUSING IN ST. PANCRAS.—On Saturday last week a number of residents of St. Pancras and others paid a visit of inspection to Goldington-buildings, the latest addition to the blocks of working men's flats in the north-western part of the metropolis. The foundation-stone of the building was laid by a former Mayor of St. Pancras, Alderman Barnes. Mr. K. D. Young was the architect, and Messrs. Whitehead and Co. were the builders. The building consists of five stories.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, OVINGHAM, NORTHUMBERLAND.—Stained-glass windows have been placed in the Ovingham Parish Church and in St. Oswin's Church, Wylam, in memory of Mr. Richard Clayton. The designs were prepared by Messrs. Clayton and Bell, of London.

SANITARY AND ENGINEERING NEWS.

GLASGOW DRAINAGE SCHEME.—**The sewage works at Dalmuir erected by Glasgow Corporation in connexion with the drainage scheme for the western district of the city, and the adjoining burghs of Partick and Clydebank, were opened on the 31st ult. The works represent an expenditure of about a million sterling. They are situated on the north bank of the Clyde, at the western limit of the "long town" formed by Yoker, Clydebank, and Dalmuir, and over nine miles from the centre of the city. The centrifugal pumping plant required to raise the sewage consists of two compound engines, each capable of lifting 4,200 gallons per minute through a net height of 20 ft., and one triple-compound engine capable of raising 9,000 gallons per minute through a similar height. The electrical power and distribution plant consists of two direct driven steam dynamos, each capable of delivering 300 h.p., and one similar generator capable of delivering 150 h.p. These engines, together with the centrifugal pumping engines, are connected to two independent direct steam-**

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driven surface condensing plants. The boiler plant consists of four Lancashire boilers, 7 ft. 6 in. by 30 ft., suited to a daily working pressure of 160 lb. per sq. in., and fitted with mechanical stoking plant and fuel economiser. The boiler auxiliary consists of independent steam pumps and feed water filters and coal elevator and conveying plant. The works are electrically driven, current being supplied at 230 volts at the switchboard, and distributed to the various motors throughout the works for driving the screen gear, elevating machinery, auxiliary pumps, lime-mixers, and the workshop plant. In addition, power is distributed to the sludge pumping plant situated at the south end of the precipitation tanks. The sewage treatment machinery embraces rough and fine screens through which the sewage passes on its way to the catch-pit, a travelling dredger for dealing with the heavy deposit in the catch-pit, revolving lime-mixers and travelling lime-mixers for the preparation of milk of lime, and oxidisers for the preparation of iron liquor. A water tank is provided on the roof of the power-house annexe, from which a supply of Corporation or burn water may be drawn. The main sludge tanks to the south of the precipitation tanks are each 150 ft. long by 35 ft. wide, by 10 ft. 3 in. total inside depth, built in combination with mid-division common to both. Each tank has a capacity of 1,470 tons of undrained sludge, and they are erected on a sub-structure of brickwork. The sludge is discharged from the precipitation tanks to the pump well under the pump-house immediately east of the main tank. From this well the sludge is raised by three direct motor-driven centrifugal sludge pumps, each capable of raising 1,500 gallons of undrained sludge per minute. These pumps are placed in the pump-house immediately over the pump well, and in this house are also placed the auxiliary motor-driven exhausters and the electrical switchboard. From the tanks the sludge is drawn off through large pipes to the wharf, where are placed the sludge loading pipes. These loading pipes have swivelling arms, suspended from a gallows on the wharf, and are capable of being lowered out over the deck of the sludge steamer, permitting the sludge to be discharged by gravity from the sludge tanks into the sludge steamer hold. The mechanical equipment of the station was carried out, from the designs of Mr. D. H. Morton, engineer, Glasgow, by Messrs. D. Stewart and Co., Ltd., Glasgow.

SEWERAGE SCHEME, GREYSTONES, IRELAND.—The Local Government Board has sanctioned the proposed sewerage scheme at Greystones. The scheme has been prepared by Mr. J. H. Ryan, M.Inst.C.E., and Mr. R. M. Butler, M.Inst.C.E., both of Dublin. The septic tank is the system adopted.

WATERWORKS, LYNTON.—The new waterworks at Lynton were opened recently. The intake is at Cherribridge, 70 ft. higher than the old reservoir in Station-hill, and there the water passes through a screening chamber where all coarse suspended matter is kept back. Thence the water is conveyed in 8-in. cast-iron pipes to Lynton, where the new main is connected direct to the old service mains. One hundred yards from the intake is a filter-house, in which is a battery of automatic compressed air and oxidising water filters. This method of filtration only requires a ground space of 40 sq. yds. The scheme has been carried out from the plans of Mr. W. H. Chowins, Surveyor to the Board, at a cost of 2,500*l*.

FOREIGN.

FRANCE.—The late M. Léon Dru, the engineer, has left to the State the historic Château of Vez, with its art collections, on the condition that this fine architectural monument is scheduled among the Monuments Historiques. The testator has left 40,000 francs in *rentes* for keeping up the Château, and M. Boeswilwald has been appointed as architect in charge of the work.——A sum of 160,000 francs has been voted for the improvement of the port of St. Valéry-sur-Somme——A considerable portion of the ancient Château of Pierrefort has been destroyed by fire.——The municipal authorities of Mentone have decided on the creation of an art museum in the town.——The ancient Church of St. Lo is to be restored under the direction of M. de la Roque, architect. The vaulting is in a dangerous state.——The jury of the Ecole des Beaux-Arts for the architectural competition of the first class has awarded "premières medailles" to M. Aubin and M. Roze, pupils of M. Laloux, and to M. Guyon, pupil of M. Paulin.——A new post and telegraph office is to be built at Besançon, from the designs of M. Maurice Forien.——The Chamber of Deputies has voted a sum of 15,000,000 francs for the construction of a railway from Tananarive to the coast of Madagascar.——The "Société Historique" of Auteuil and Passy has opened, in the lecture-room of the Guimet Museum, its first historical and archæological exhibition.——The monument by M. Lenoir to the composer César Franck is to be inaugurated shortly in the square of Ste Clothilde, Paris, and a statue of Bernardin St. Pierre is to be erected in the Jardin des Plantes.——The death is announced, at the age of fifty-three, of M. Henri Champion, assistant "architecte-voyer" to he Municipality of Paris. He was a member of the Société Centrale, and architect of works of some interest both in Paris and in the provinces.

UNITED STATES.—The Quarterly Bulletin of the American Institute of Architects (dated "January," but which has only just reached us) records that at the meeting of the Board of Directors in January, the secretary read a communication from Mr. McKim, on the construction of the new buildings for the Agricultural Department, and the new National Museum on the Mall. As this is a part of the proposed scheme laid out by the Park Commission, it was thought necessary that some action should be taken so as to secure uniform grades and sky line that would be in harmony with each other and also with the future development of Washington. After discussing the importance of this feature of the future development of Washington, Mr. C. F. McKim was appointed chairman of the committee, with power to select his associates, and to take such action as he thought best towards securing some form of Government censorship which would assure these buildings being erected in harmony with the proposed improvement of Washington.——It has been decided to ho... the next convention of the American Institute of Architects in Washington, in the early part of the month of December next. It was also determined, upon a motion of Mr. Geo. B. Post, that a special social meeting should be held in St. Louis, at such time and under such circumstances as the President of the Institute should elect: it was determined that the most advantageous time would be during the month of June of this year.

ROUMANIA.—There are now being erected in the town of Constantza, at a cost of about 20,000*l*., law courts, an official residence for the prefect, and a royal villa. The municipal authorities intend to spend 12,000*l*. on the construction of a casino this year, and also to erect iron buildings for a market. Other schemes for the improvement of the town are under consideration, including the paving of the principal streets with granite and a partial system of drainage.

DENMARK.—It is announced in the *Moniteur Officiel du Commerce* that the Danish Government is inviting tenders for the reconstruction of the Castle of Kristiansborg, the ancient palace of the Kings of Denmark. The cost of the work will probably amount to over 330,000*l*. It is also stated that the Danish State Railways will shortly invite tenders for the construction at Copenhagen of a central workshop for machinery, at a cost of about 178,000*l*., and of a central station at Copenhagen, at a cost of 1,000,000*l*.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The office of the District Surveyor for South Islington, Shoreditch, and Norton Folgate, has been removed to No. 169, High-street, Shoreditch, E.

ADVERTISEMENT HOARDINGS.—The Islington Borough Council considered at their meeting on Friday of last week a circular letter from the Royal Institute of British Architects, directing attention to the abuse of buildings by advertisement hoardings, and urging the importance of some control by public authorities over such advertisements. The Parliamentary and General Purposes Committee presented a report to the effect that they were of opinion that, in some instances, advertisements were placed in positions detrimental to surrounding property, and so as to be a disfigurement to the streets. The following motion was passed:—"That the London County Council be requested to consider the desirability of making a by-law, or taking such other steps as they may deem advisable to regulate advertisement hoardings upon buildings having a frontage to any street or public place in the metropolis."

QUEEN VICTORIA MEMORIAL, IPSWICH.—The unveiling of the statue of Queen Victoria, which has been placed in Christchurch Park, Ipswich, took place recently. The figure is 9 ft. in height, and represents the late Queen at about the age of thirty years. Mr. Herbert Hampton was the sculptor for the work.

BUILDERS' FEDERATION MEETING AT NEWPORT.—The quarterly meeting of the South Wales Building Trades Employers' Federation was held at the King's Head Hotel, Newport. Mr. Blackburn (Newport) reported having attended the committee meeting, composed of the master builders and master plasterers, held at Derby, where working rules were drawn up, which were accepted by the Plasterers' Society. A discussion arose as to the practice of sending in priced bills of quantities with tenders, and it was decided to refer the question back to the different associations. It was decided that the next meeting be held at Pontypridd. At the annual meeting of the Federation, the following officials were elected for the ensuing year:—President and chairman, Mr. Watkin Williams, Pontypridd; senior vice-president, Mr. W. T. Morgan, Cardiff; junior vice-president, Mr. W. A. Linton, Newport; treasurer, Mr. W. Thomas, Cardiff; auditors, Mr. W. O. Jenkins, Swansea, and Mr. T. James, Pontypridd; and secretary, Mr. W. H. Billings, Swansea. The retiring chairman (Mr. B. Bennett) was thanked for his services.

HAREFIELD LIME AND WHITING WORKS.—At the Mart, Tokenhouse-yard, City, on June 8, Messrs. Humbert and Flint submitted to auction (in consequence of a dissolution of partnership), as a going concern, the Harefield Lime and Whiting Works, Middlesex, including the goodwill. The premises are situate three and a half miles from Rickmansworth Station, on the Metropolitan Railway, and possess a canal frontage of about a quarter of a mile to the Grand Junction Canal, with shoots for lading, which, the auctioneers pointed out, afford exceptional facilities for supplying chalk to the "stock" brickfields from Cowley to Slough, West Drayton, Southall, etc., and in direct communication with Paddington. The portion of the property used for the lime and whiting works includes an area of 24a. 3r., containing extensive deposits of chalk, flints, gravel, sand, and hoggin; there is a chalk cliff, with a facing of nearly a quarter of a mile, and attaining a height of about 130 ft. The buildings comprise a dwelling-house, four cottages for labourers, van shed, stabling, three domed lime kilns, two open and continuous lime kilns, large whiting drying shed, engine shed, with 6 h.p. portable engine, driving two grinding mills, and an engine-house having a deep artesian well, with draw pump, and fitted with 25 h.p. oil-engine, driving the large chalk mill for whiting grinding. This portion of the property is leasehold, for a term of about thirty-nine years unexpired, at 180*l*. to 190*l*. per annum. The brickfields embrace an area of about 19a. 0r. 2p., with an abundant supply of brick earth, which makes both red and stocks, two new Scotch kilns, each holding 50,000 bricks, four large settling backs for washed clay, brick burner's hut, sand-house, three pug mills, and clay wash mill, etc. This portion is held under a grant of lease and licence to dig, cart, and carry away on to the premises, comprised in the lease before-mentioned, clay for the purpose of making bricks or cement, for a term to run concurrently with the lease of the lime works, the grantee paying a royalty of 2s. per 1,000 for all bricks made, and an additional royalty of 1s. per square yard for every yard of clay used for the manufacture of cement. The sale of bricks was guaranteed to average 500,000 in every year of the tenancy. The whole of the fixed machinery and trade requisites, with 100 tons of metal rails, barrows, etc., were to be included in the sale, and possession to be given on completion of the purchase; the vans, horses, and other movable effects to be taken by the purchaser at a valuation. Although there was a good attendance in the auction room, no bid was forthcoming, and the lot was accordingly passed, with an intimation that the vendors were prepared to sell by private treaty.

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science, held at Manchester, on June 3 and 4, three candidates presented themselves, and one candidate, Mr. Cecil H. Norton (Worcester), was awarded a certificate.

Legal.

ANCIENT LIGHT DISPUTE.

THE case of Abbott and Sharland *v.* Holloway, Whiddington, and Turner came before Mr. Justice Buckley in the Chancery Division on the 1st and 2nd insts.

This was an action for an injunction to restrain the defendants, their servants, agents, and workmen, from erecting any building or other erection upon the site of Nos. 19 and 20, Ham-yard, Great Windmill-street, so or in such manner as to obstruct the ancient lights of the plaintiffs' premises, No. 39, Great Windmill-street, as such lights were enjoyed prior to the recent demolition of the old buildings at Nos. 19 and 20, Ham-yard, and for a mandatory injunction, and damages.

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Mr. Buckmaster, K.C., and Mr. Maughan appeared for the plaintiffs; and Mr. Astbury, K.C., and Mr. Cozens Hardy for the defendants.

Mr. Buckmaster, in opening the case, said the plaintiffs were the freeholders of 39, Great Windmill-street, the defendant Turner was the freeholder of the property which was formerly known as Nos. 19 and 20, Ham-yard, the defendant Holloway was the builder engaged under the terms of a building contract on the site of 19 and 20, Ham-yard, and the defendant Whiddington was the architect engaged on the scheme. The action was brought for an injunction to restrain the erection of a building on the site of Nos. 19 and 20, Ham-yard in such a manner as to affect the lights which were enjoyed by the plaintiffs' premises before the property which stood on Nos. 19 and 20, Ham-yard was pulled down. The recent decision in the House of Lords to some extent modified the course the Courts had taken in such matters. But he was in a position to establish that the building which it was proposed to erect would occasion a very serious nuisance to the plaintiffs' property. The old buildings in Ham-yard were about 30 ft. high, and at a distance of 25 ft. from the plaintiffs' buildings. The proposed new building was to go to a height of 63 ft. He had no doubt that the premises to be erected by the defendants would darken his clients' premises, and a serious wrong would exist. Some of the windows would nearly lose their light altogether.

In answer to his lordship, Mr. Astbury said he did not deny that there was an obstruction of the plaintiffs' light; but the question was whether there should be an injunction or damages. His defence could be embodied under three points—viz., (1) since the case of Colls this building of defendants came under the designation of a big town improvement; (2) that if it had not been for the fact that they had purchased the rights of No. 18, the building to be erected would not in any way affect the plaintiffs' premises; and (3) even when the defendants' building was erected the plaintiffs would enjoy a direct south-west light.

Mr. Buckmaster said that to his mind the question was whether or no what defendants were going to do created a legal nuisance to the plaintiffs which entitled them to an injunction.

Mr. Astbury said he should argue that there would have been no right of action if No. 18 had not been there. His clients' building would have no material effect on the plaintiffs' building. If there was an actionable wrong, then he should say it was so trifling that damages would meet the cast. He did not dispute that the plaintiffs' lights were ancient.

The first witness called was Mr. A. O. Collard, architect. He said he had examined the plaintiffs' premises, and had been informed of the probable height of the defendants' building. In his opinion, the defendants' proposed building would very largely interfere with plaintiffs' light and cause a nuisance.

Mr. E. B. I'Anson, an architect and surveyor, said he had visited the *locus in quo*, and had formed the opinion that defendants' building would materially affect the light coming to the plaintiffs' premises, and a nuisance would be created.

Cross-examined,

In his opinion the defendants' building would very materially interfere with the effective light of plaintiffs' windows.

Mr. Douglas Young, F.S.I., one of the valuers to the Board of Trade, said that in his opinion the value of the plaintiffs' property by reason of the obstruction of light would be depreciated by 600*l*. He also thought that the letting and selling value of the property would be affected.

Other evidence having been given,

The first witness for the defence was Mr. E. A. Gruning, architect and surveyor, who said if No. 18, Ham-yard were pulled down to its original height, and Nos. 19 and 20 were raised, this would not create a nuisance to the plaintiffs' house. To his mind, ample light would remain for all reasonable purposes. In his opinion, the ground value of plaintiffs' premises was being increased by the erection of the defendants' buildings and the general improvement in the neighbourhood.

Mr. Wm. Whiddington, architect and surveyor, gave evidence of a corroborative nature.

Mr. Henry Hall, an architect, said he was architect for 18, Ham-yard when it was rebuilt, and the owners of the plaintiffs' premises then received 75*l*. for allowing the building to go to a certain height.

When the case was resumed on Thursday morning, his lordship said, on his way to Court, he had viewed the premises, and he should like Mr. Buckmaster to consider the offer made by the defendants some time since.

A consultation took place between counsel, and eventually Mr. Buckmaster said there had been an offer made by the defendants to pay their taxed costs and leave his lordship to say what amount of damages the defendants should pay the plaintiffs.

His lordship said his intention was to send the matter to a surveyor to say if any damage at all had been done by the defendants. No doubt some light would be taken from the plaintiffs' building by the defendants' buildings; but the question was whether the light taken away was sufficient to cause a nuisance and so entitle the plaintiffs to damages.

Mr. Buckmaster said he regretted that they could not agree upon the amount of damages, and they would agree to an independent surveyor assessing them.

His lordship said there would be a consent order by which the defendants paid the taxed costs and each side paid half the surveyor's fees. The question he should put to the surveyor was whether the erection of defendants' building, having regard to the increased benefit thereof, would depreciate to any, and what, extent the value of the plaintiffs' premises.

Mr. Buckmaster and Mr. Cozens Hardy assented.

His lordship: I understand that the defendants are prepared to abide by whatever the surveyor may find.

Mr. Cozens Hardy: Yes.

His lordship made the order accordingly, he to appoint a surveyor, failing an agreement between the solicitors and parties.

ACTION BY A SURVEYOR.

THE case of Golds *v.* the Frinton-on-Sea Urban District Council came before Mr. Justice Farwell, sitting as an additional Judge of the King's Bench Division, on the 2nd inst.

This was an action by Mr. T. W. Golds against the defendants to recover 269*l*. 9s., which he alleged to be due to him for salary and for services rendered and work done.

Mr. T. W. Wheeler, K.C., and Mr. Hudson appeared for the plaintiff; and Mr. F. Low, K.C., and Mr. George Elliott for the defendants.

The plaintiff, in his claim, set forth that the amount he sued for was in respect of his salary as surveyor, salary as inspector of nuisances, visiting and examining drain connexions, and making surveys, and superintendence of works at the Esplanade and at Hadleigh-road.

Defendants admitted the plaintiff's claim for certain sums, but they claimed to be entitled to deduct an amount for road-making expenses in respect of plaintiff's house in the Hadleigh-road. As to the Esplanade work, defendants denied that there was any agreement to pay the sum claimed by way of commission or otherwise, but said that if any such agreement was made, it was not made in accordance with the provisions of the Public Health Act, 1875. Defendants also alternatively said that if any such agreement was made, it was that the plaintiff should have a commission on only such part of the cost of the works as should be contributed to by private owners.

After hearing counsel and the evidence, his lordship dismissed the action. He said the question to be decided was whether the plaintiff was entitled to receive an extra sum in respect of the contract for the Esplanade work. So long as the plaintiff was surveyor, he was bound to do all the surveyor's work for his salary. If he was to get extra salary for doing extra work, that would be a contract which would have to be proved, and if it exceeded 50*l*. it would have to be under seal. But there was no contract, and, in his opinion, the action failed.

Mr. Elliott stated that the defendants had paid a certain sum into court.

His lordship said that the plaintiff would have the payment out of court of the amount of his salary, and the sums admitted by the defendants to be due to him, with the costs up to the time of the payment into court, the balance to be paid to the defendants with costs from that date.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

10,640 of 1903.—H. NEWTON: *Wash Boilers, Coppers, Boiling Pans, and like vessels.*

According to this invention, a wash boiler or copper may be cast with, or otherwise provided with, a central, or otherwise disposed, division or partition for the purpose of facilitating the washing of the clothes by enabling one compartment to be used to boil one portion of the clothes, such as the fine white or linen clothes, whilst the other compartment is used to boil another portion of the clothes, such as the coarse greys or calicoes. Or one compartment may be used to boil one portion of the clothes being washed, whilst the other is used to secure a supply of clean boiling water ready for use.

10,700 of 1903.—G. F. LYMAN, P. S. STEPHENSON, and A. B. TAYLOR: *Devices to Prevent Rattling in Windows.*

A device consisting in the combination of a spring arm, having its lower end bent at substantially right angles to the main body thereof, a locking device engaging said lower end, connexions intermediate said arm and said locking device, and a roller carried by the free end of the spring arm.

11,120 of 1903.—E. PHILLIPS: *Lifts, Elevators, and Hoists.*

Lift operating gear, comprising a shaft carrying a worm at each end, a drum-shaft at each side of the lift carrying worm wheels gearing with the said worms, ropes or chains at the sides of the lift connected to the platform or cage and running on to winding drums on the drum-shaft, pulleys at each side of the lift, and ropes or chains running over the pulleys and connecting with counterweights.

11,146 of 1903.—R. BLAIR and B. W. GONIN: *Wood-working Machines.*

Wood-working machines, consisting in the combination with permanently-fixed vertical lower side frames, vertically-adjustable upper side frames, recesses in the horizontal edges of said side frames, bearings capable of limited vertical adjustment disposed within said recesses, vertical retaining grooves in said bearings, retaining caps for said bearings, driven spindles mounted in said bearings, driving-belt pulleys rigidly mounted on the ends of said spindles, and driving rollers centrally-mounted on said spindles.

11,470 of 1903.—J. CALLIE: *Windows.*

This relates to windows, and consists in carrying a swivelling window by means of a pair of pins attached to the window, and carried in bearings in the sash, so as to be capable of axial and angular movement therein, the lower pin being adapted to be raised and lowered by a cam, which locks the said lower pin against axial movement in its upper and lower positions.

11,503 of 1903.—A. E. RICKABY: *Appliances for Supporting Shelves, and other devices, in Shop Window Dressing, and other like purposes.*

A standard or bar shaped with notches and recesses, and a sleeve or socket with projections on the inside, this sleeve or socket shaped so that the projections in same engage the complementary recesses in the standard or bar, and thereby fix the sleeve or socket at any required point, or by a motion to disengage the said notches and projections, and so allow the sleeve or socket to travel up or down the standard or bar.

14,809 of 1903.—R. ADAMS: *Door Springs and Checks.*

A door-closing appliance, consisting in the combination with a pivot and one or more pins, studs, rollers, or the like, engaging a recessed or toothed bar, a spring or springs of the helical or spiral type, so mounted between said door and a fence-plate, or equivalent abutment, as to enable the lateral resilience of said springs to be utilised as well as the axial-compression power thereof.

15,117 of 1903.—M. HELLIWELL: *Cowls for Chimney and Ventilating Shafts.*

This invention relates to cowls for preventing down draught in chimneys, and the like. In carrying out the invention, a vertical spindle is secured in a convenient manner at the top of a chimney, or like shaft, and upon the point of said spindle is mounted a cowl of triangular shape in one vertical direction, and square, circular, or other convenient shape in the other vertical direction, the bottom of the cowl being open, and the inclined plate forming the top of cowl of such length as to extend below and protect the top of chimney, or the like opening.

16,815 of 1903.—H. BRANGET: *Apparatus for Separating or Grading Ground or Pulverised Materials.*

Apparatus for separating pulverised material, comprising a closed casing, and consists in the combination of a fixed, inclined cylinder, means for delivering thereto materials to be sorted, a shaft mounted axially in the cylinder, means for rotating the shaft, a structure for stirring up the contents of the cylinder carried on the shaft and rotated therewith, a screw fin for advancing the materials within the cylinder, and means for furnishing an air blast in a direction opposite to the advance of the material.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

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18,211 of 1903.—G. WATSON: *Construction of Destructor, and other Furnace Arches and Crowns.*

The construction of destructor and other furnace arches or crowns by means of blocks of refractory material joggled on the four sides, which are at right angles, or approximately so, to the interior surface of the furnace arch or crown.

21,880 of 1903.—A. TOISOUL, E. A. FRADET, and L. PIEDBŒUF (trading as Toisoul, Fradet, and Cie.): *A Crematorium or Crematorium Gas-Furnace, and Method of Working the same.*

The construction of crematoriæ, characterised by the provision in connexion with an incinerating or combustion chamber of a gas fire arrangement, passages for admitting air independently of the firing arrangement, an arrangement for heating the air to be admitted by the waste heat from the products of combustion, and cocks, or valves, and dampers, whereby the admission of gas and air can be regulated independently one of the other.

24,911 of 1903.—H. EARLE (H. Trachsler): *Manufacture of White Cement.*

This invention relates to a process of manufacturing white cement and the production of an article adapted for either indoor or outdoor use. In carrying out the invention, white chalk, kaolin, felspar, or carbonate of sodium, or carbonate of potassium are mixed together in such proportions that the resultant compound shall, when burnt as a cement, give the following composition on analysis—that is to say: silica, from 28 to 30 per cent.; lime, from 61 to 63 per cent.; alumina, from 4 to 6 per cent.; alkalies, from 2 to 3 per cent. All the raw materials specified are freed from iron, and their admixtures may be effected by either the dry or the wet method. After thorough admixture the materials are burnt kilns, or other such like means, as in the process usually employed for the manufacture of Portland cement.

25,360 of 1903.—O. WILHELME: *Street Pavements.*

Production of a pavement, or a pavement foundation from concrete, cement, or other suitable plastic material, by first mounting on the street base cells or frames, composed of strips of tarred cardboard, paper, or other suitable material, filling the cells with the said plastic matter, with or without stamping, and finally rolling or stamping the surface, so as to consolidate the cells without destroying the partitions.

645 of 1904.—BROWN'S FOUNDRY COMPANY, LTD., and J. BROWN: *Fire Grates.*

A domestic fire grate, consisting of bottom capable of sliding in and out at will to adjust the size of the fire, in combination with an adjustable canopy.

3,249 of 1904.—R. M. DAELEN: *Manufacture of Girders, and the like.*

Rolls for producing I-iron girders, and the like, the distinguishing feature being that the first three or five of the groves of the roll are furnished with a curvature in the middle, into which a part of the material forming the blank enters, and is thereupon rolled out, without the exercise of any pressure on the edges of the rolls, so that this pressure is less than with rolls having grooves of the ordinary form.

7,387 of 1904.—R. B. FERGUSON: *A Combined Spirit-level and Angle-gauge.*

The object of this invention is to combine a spirit-level and angle-gauge, for use by carpenters, surveyors, architects, and others, and by the use of which any angle, as well as a horizontal or perpendicular line may be determined. The stock or body of the level, straight-edge, or instrument to which this invention may be applied is formed with a cavity passing transversely through it, and is provided with face plates which slightly overhang the cavity, and a metallic lining which fits the cavity, and is formed with an interiorly-situated spider carrying a hub. On each side of the spider there are sectors having collars which turn freely round screws, working respectively in the end of the hub, and constituting bearings for the sectors. By tightening the screws the sectors may be locked in any desired position, and when the screws are loose, the sectors are free to swing around the screws and the hub. Each sector is formed with an opening extending transversely through it, and bubble glasses are suitably secured in the sector, so as to be visible through these openings. Since the openings extend completely through the sectors, the bubble glasses are visible from each side of the sectors, and owing to the open form of the spiders, the bubble glasses are visible from both sides of the stock. Each sector is provided with an indicator, secured on its outer side, and reading with respect to scales formed on annular dial-plates, secured between the face-plates and the lining, the sectors fitting loosely between the respective dial-plates and the sides of the spider.

7,718 of 1904.—J. P. JORGENSEN: *Moulding Machines for the Manufacture of Bricks, and the like.*

A moulding machine for the manufacture of bricks, and the like, in which the bottom plates are supported by a solid block made in one piece, or divided for the purpose of preventing vibration and loosening of the moulding material during the beating down thereof.

8,050 of 1904.—J. UNDERWOOD and G. E. HACK: *Dividers, Callipers, and the like.*

Dividers, callipers, and the like, consisting in the arrangement of a regulating screw, having right and left hand threads upon it, engaging with pivotally-mounted nuts upon the legs to be adjusted.

8,175 of 1904.—R. E. LEETHAM: *Structures for the Storage and Delivery of Merchandise.*

This consists in the combination with a number of inclined delivery storage compartments, provided with outlets or traps, of a common drop or shoot, by means of which packages delivered from any one of the number of compartments may be led to one point.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 16.—By H. M. HEXT (at Chard).

Tatworth, Somerset.—"Chilson Estate," 160 a. 1 r. 4 p., f. £3,375

May 27.—By BRODIE, TIMBS, & CO. (at Folkestone).

Folkestone, Kent.—113 and 115, Cheriton-rd., u.t. 90¼ yrs., g.r. 16*l.*, y.r. 140*l.* 1,460

By COBB'S (at Sittingbourne).

Strood, Kent.—111, Weston-rd., f., q.r. 16*l.* .. 365
107 and 109, Weston-rd., f., w.r. 40*l.* 6s. .. 615
Broomhill, freehold building estate, 3 a. 2 r. 15 p. 550

May 28.—By BRUTON, KNOWLES, & CO. (at Gloucester).

Hucclecote, etc., Gloucester.—"The Zoons Farm," 225 a. 3 r. 31 p., f., y.r. 180*l.* 4,275
Twyning, Gloucester.—"Wood End Farm," 130 a. 2 r. 21 p., f., y.r. 300*l.* 5,500
Eldersfield, Worcester.—"Moorend Farm," 88 a. 3 r. 28 p., f., y.r. 80*l.* 1,625

By BRODIE, TIMBS, & CO. (at Canterbury).

Herne Hill, Kent.—"The Dale Farm," 22 a. 2 r. 28 p., f., y.r. 74*l.* 1,570
Canterbury, Kent.—52, St. Dunstan's-st. (offices), f., y.r. 10*l.* 8s. 200

By R. A. & G. THOROWGOOD (at Hertford).

Bennington, Herts.—"Curtain Hill Farm," 33 a. 1 r. 22 p., f., y.r. 34*l.* 750
"High Elm," enclosures, 15 a. 2 r. 38 p., f., y.r. 16*l.* 245

May 30.—By ELLIOTT, SON, & BOYTON.

Regent's Park.—17, Kent-ter., u.t. 22 yrs., g.r. 31*l.* 10s., p. 500

By HERRING, SON, & DAW.

Norwood.—Norbury Hill, "Norbury Hill House" and 5 a. 3 r. 28 p., part f. and part u.t. 2¼ yrs., g.r. 30*l.*, p. 5,500

By KEMSLEYS'.

Woodford-Green, Essex.—Salway Hill, "Ivy House," and 6¼ acres, f., p. 4,300
1, Manor Cottages (Golf Club House), f., y.r. 30*l.* 420
2 and 3, Manor Cottages, f., y.r. 46*l.* 650
Sunset-av., a plot of building land, c. 120
Manor-rd., "Manor Cottage," c., y.r. 22*l.* .. 455
1 to 4, Carlton Cottages, f., y.r. 112*l.* 1,490

By WM. HOUGHTON.

Walthamstow.—Chapel End, "Salisbury Hall Building Estate," 141 a. 0 r. 6 p., f., y.r. 310*l.* 25,000
6, 8, and 10, Albert-rd., f., y.r. 80*l.* 14s. 1,235
High Barnet, Herts.—1, Lorne-villas, f., y.r. 19*l.* 190
New Barnet, Herts.—Victoria-rd., "Brooklea," f., y.r. 26*l.* 360
Potter's Bar, Middlesex.—High-rd., freehold building site, p. 195

By J. H. LYNCH.

St. John's Wood.—16, New-st., u.t. 23¼ yrs., g.r. 4*l.*, y.r. 38*l.* 305

By MAY & PHILPOT.

Balham.—7 and 8, Holly-gr., f., w.r. 52*l.* 580

By J. RYMER & CO.

Kingston, Surrey.—Fife-rd., a freehold building site 1,950

By SCOBELL & LAKE.

Crouch End.—26, Park-rd., u.t. 51¼ yrs., g.r. 3*l.* 5s., w.r. 35*l.* 2s. 235
Fulham.—34, Sherbrooke-rd., u.t. 72¼ yrs., g.r. 5*l.* 10s., w.r. 36*l.* 8s. 305

By FRED VARLEY & SON.

Kentish Town.—57, Grafton-rd. (s.), f., y.r. 40*l.* 485
Highbury.—205, Blackstock-rd. (s.), u.t. 66 yrs., g.r. 10*l.*, e.r. 50*l.* 400
Stoke Newington.—152, Lordship-rd., u.t. 70 yrs., g.r. 10*l.*, e.r. 65*l.* 550
Wood Green.—11, Mannock-rd., u.t. 96 yrs., g.r. 6*l.*, e.r. 32*l.* 240
Bowes Park.—2, Manor-rd., u.t. 95 yrs., g.r. 7*l.*, e.r. 34*l.* 320

By WILLOUGHBY, SON, & CALLOW.

Norwood.—170, 172, and 174, Norwood-rd. (s.), also stabling, u.t. 41¼ yrs., g.r. 13*l.* 5s., y.r. 194*l.* £3,000
Norwood-rd., a freehold site, area 3,240 ft., y.r. 20*l.* 400
Dulwich.—Lancaster-rd., f.g. rents 50*l.*, reversion in 75 yrs. 1,363
Norwood.—Court-rd., f.g. rents 14*l.*, reversion in 75 yrs. 371
Chiswick.—13, Ellesmere-rd., u.t. 97 yrs., g.r. 9*l.*, p. 620

By EDWARD WOOD.

Leytonstone.—6 and 8, Wood-st., and plot of land adjoining, f., w.r. 54*l.* 12s. 410
East Ham.—231 and 233, Central Park-rd., u.t. 96 yrs., g.r. 10*l.*, w.r. 72*l.* 16s. 400
Wimbledon.—65 and 67, Haydons-rd. (s.), u.t. 76¼ yrs., g.r. 12*l.*, w.r. 74*l.* 2s. 380

By WRIFORD, DIXON, & WINDER.

Bermondsey.—90, Rolls-rd., u.t. 29¼ yrs., g.r. 3*l.* 5s., w.r. 33*l.* 16s. 230

By J. H. BETHELL (at East Ham).

Plaistow.—Wigston-rd., fifty-four plots of freehold building land 2,543
Prince Regent's-la., eight plots of freehold building land 481

By ALFRED RICHARDS (at Enfield).

Enfield Highway.—13 to 23 (odd), Oatlands-rd., u.t. 77 yrs., g.r. 18*l.*, w.r. 101*l.* 8s. .. 395
Waltham Cross, Herts.—Freezywater, "Nursery Cottage" and "Elizabeth Cottage," f., w.r. 41*l.* 12s. 465

May 31.—JOHN BOTT & SONS.

Upton Park.—187 to 195 (odd), Plashet-rd. (s.), u.t. 82 yrs., g.r. 40*l.*, y.r. 196*l.* 1,425

By DEBENHAM, TEWSON, & CO.

Eastcheap.—Botolph-la., St. George's Church site, area 2,890 ft., f., p. 9,000

By DUNCAN & KIMPTON.

Holloway.—172, Tollington-pk. (dining rooms), f., y.r. 60*l.* 1,080
166, 168, and 170, Tollington-pk. (s.), u.t. 43 yrs., g.r. 36*l.*, y.r. 195*l.* 1,910
Herne Hill.—12, Milton-rd., f., y.r. 40*l.* 520
Tooting.—98 and 100, Himley-rd., f., e.r. 65*l.* 620
70, Brightwell-cres., f., w.r. 28*l.* 12s. 360
Dulwich.—Underhill-rd., f.g.r. 7*l.* 10s., reversion in 66 yrs.; also a rental of 8*l.* for 7¼ yrs. 400

By DUNN, SOMAN, & COVERDALE.

Kentish Town.—33, Malden-rd. (s.), u.t. 40¼ yrs., g.r. 8*l.*, y.r. 52*l.* 260

By FISHER, STANHOPE, & DRAKE.

Clapton.—2, Chatsworth-rd. (s.), f., y.r. 36*l.* .. 540
Stoke Newington.—2, Osbaldeston-rd., u.t. 74 yrs., g.r. 9*l.*, e.r. 60*l.* 650

By HARRISONS'.

Woodford.—3, Cleveland-rd., f., e.r. 50*l.* 600

May 31.—By G. HEAD & CO.

Gray's Inn-road and Mecklenburgh-square.—i.g. rents 437*l.* 17s., u.t. 5 yrs., g.r. 178*l.* 10s. 705
Hampstead-road (193 to 209 odd).—i.g. rents 207*l.*, u.t. 4¼ yrs., g.r. 68*l.* 440
St. Pancras.—Grafton-pl., i.g. rents 130*l.* 15s., u.t. 3¼ yrs., g.r. 50*l.* 10s. 265
Euston-sq., etc., i.g.r. 85*l.*, u.t. 3¼ yrs., g.r. 18*l.* 160
Kilburn.—54 and 56, Denmark-rd., u.t. 55¼ yrs., g.r. 10*l.*, w.r. 93*l.* 12s. 490
20 and 22, Albert-rd., u.t. 55¼ yrs., g.r. 10*l.* 10s., w.r. 85*l.* 16s. 410

By C. SPARROW & SON.

Finchley.—Ballard's-la., "Redbourne Cottage," f., y.r. 65*l.* 1,100
Woodhouse-la., "Heatherley," u.t. 92 yrs., g.r. 5*l.*, p. 635
East Barnet, Herts.—East Barnet-ter., f.g. rents., 42*l.* 6s., reversion in 95 yrs. 895

By FREDK. WARMAN.

Islington.—265, Upper-st. (s.), u.t. 60 yrs., g.r. 30*l.*, y.r. 110*l.* 1,175
Highbury.—18, Framfield-rd., u.t. 90 yrs., g.r. 8*l.*, e.r. 48*l.* 420
Canonbury.—13, Ashby-rd., u.t. 41 yrs., g.r. 10*l.*, e.r. 60*l.* 470
27 and 28, St. Mary's-rd., u.t. 41 yrs., g.r. 4*l.*, y.r. 135*l.* 1,265
Holloway.—39, Tuffnell Park-rd. (with stables), u.t. 45 yrs., g.r. 8*l.*, y.r. 105*l.* 650

By BOYTON, SONS, & BUCKMASTER (at Fulham).

Fulham.—46, Parsons Green-la. (s.), u.t. 76 yrs., g.r. 8*l.*, y.r. 45*l.* 465
68 and 65, Britannia-rd., u.t. 52 yrs., g.r. 9*l.*, e.r. 68*l.* 550

By ALFRED RICHARDS (at Tottenham).

Tottenham.—84 and 86, Church-rd. (s.), u.t. 62 yrs., g.r. 7*l.*, y.r. 60*l.* 710
Brunswick-la., a piece of land, 0 a. 2 r. 16 p., f. 355
5, Princes-st., f., w.r. 18*l.* 4s. 150
Edmonton.—Langhedge-la., "Laburnum Cottage" and plot of land, f., w.r. 18*l.* 4s. .. 210
25, 27, and 29, Snells-pk., f., w.r. 78*l.* 670

June 1.—By TURNBULL, PARNIE, & CO. (at Glasgow).

Colmonell, Ayrshire.—"The Ballochmorrie Estate," 965 acres 13,520

June 2.—By DEBENHAM, TEWSON, & CO.

Plymouth.—George-st., "The Theatre Royal and Opera House," area 15,500 ft., u.t. 96¼ yrs., g.r. 2,000*l.*, including scenery and properties of the "Aladdin" pantomime 10,820
Sydenham.—Miall-rd., f.g. rents 44*l.*, reversion in 75 yrs. 880

By BALCH & BALCH.

Kentish Town.—13, 15, and 17, Prince of Wales-rd. (s.), u.t. 28 yrs., g.r. 5*l.*, y.r. 20*l.* 1,370
Holloway.—36, Bickerton-rd., u.t. 72¼ yrs., g.r. 8*l.*, p. 450

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By FAREBROTHER, ELLIS, & Co.
Southwark.—42, Borough High-st. (s.), area 1,400 ft., p. £3,300

By FIELD & SONS.
Holborn.—9 to 15 (odd), Leather-la., 16 and 17, Dorrington-st., 18 and 19, Brookes'-market, 15, 16, and 17, Beauchamp-st. (shops and houses), area 5,115 ft., f., y.r. 416*l.* 6s. 7,100
Bermondsey.—21, 23, and 25, Galley Wall-rd., u.t. 54 yrs., g.r. 6*l.* 6s., w.r. 109*l.* 4s. .. 760

By J. HOOD & SONS.
Forest Gate.—75, Shrewsbury-rd., f., w.r. 44*l.* 4s. 450

By NEWBON, EDWARDS, & SHEPHARD.
Islington.—Liverpool-rd., f.g.r. 22*l.* 10s., reversion in 4½ yrs. 1,700
46, Halliford-st., u.t. 41 yrs., g.r. 6*l.*, y.r. 45*l.* 430
Caledonian-road.—No. 375 (s.), u.t. 38½ yrs., g.r. 8*l.*, y.r. 60*l.* 500
Camden Town.—12, Marquis-rd., u.t. 37½ yrs., g.r. 6*l.*, y.r. 34*l.* 420

By ORGILL, MARKS, & LAWRENCE.
Leamington Spa, Warwick.—The Parade, "The Regent Hotel," area 8,470 yds., f., with goodwill 8,000

By PERKINS & CÆSAR.
Chelsea.—53, King's-rd. (s.), f., y.r. 110*l.* 2,700

By STIMSON & SON.
Walworth.—60, East-st. (s.), f., y.r. 45*l.* 760
1a, 2a, 3a, 19 to 41, Bronti-pl., area 47,000 ft., y.r. 1,047*l.* 8,100
1 to 18, 6a and 13a, Bronti-pl., area 35,800 ft., y.r. 894*l.* 6,150
18 to 24 (even), Blackwood-st., area 4,270 ft., f., y.r. 137*l.* 16s. 1,220
4 to 16 (even), Blackwood-st. (including the "Richmond Arms" B.-H.), area 7,770 ft., f., y.r. 238*l.* 13s. 8d. 3,100
Camberwell.—22 to 34 (even), 29 to 37 (odd), Dugdale-st.; 108 to 114 (even), Warham-st., f., w.r. 438*l.* 2s. 4,100
Lambeth.—67, 68, and 69, Tower-st.; 17 to 21, Gerridge-st.; 52 to 60 (even), Webber-row, area 6,240 ft., f., w.r. 421*l.* 4s. 2,150
Sunbury, Middlesex.—1, 3, and 4, Parkstone-villas, u.t. 59 yrs., g.r. 15*l.* 15s., e.r. 108*l.* 265

By PERKINS & SONS (at Southampton).
Chilworth, Hants. — "Chilworth-ct." and "Chilworth-gr.," area 5½ acres, f., p. 3,500

June 3.—By B. BAILEY & Co.
Battersea.—233 and 235, Battersea Park-rd. (s.), u.t. 37½ yrs., g.r. 12*l.*, y.r. 110*l.* 1,140
2, Alfred-st., u.t. 37½ yrs., g.r. 4*l.*, y.r. 14*l.* .. 100
Pimlico.—21 to 26, Union-st., u.t. 17 yrs., g.r. 21*l.*, y.r. 146*l.* 770
Manor Park.—17, Albany-rd., and 29, Carlton-rd., u.t. 72 yrs., g.r. 7*l.* 12s., y.r. 44*l.* 400

By KROENIG & Co.
Hendon.—25 to 39 (odd), Ravenstone-rd., f., w.r. 319*l.* 16s. 2,930
Sunny-gdns., "Emile Villa," f., e.r. 45*l.* .. 645
Kentish Town.—14, Oakfield-cres., f., w.r. 46*l.* 16s. 450
East Ham.—50 to 64 (even), 45 to 53 (odd), Champion Cottages, u.t. 81 yrs., g.r. 65*l.*, w.r. 240*l.* 10s. 800
Hendon.—Finchley-la., "Verulam," f., y.r. 35*l.* 460
2, Elm-villas, f., y.r. 30*l.* 405
1 and 2, Florence-st., f., y.r. 52*l.* 441

By WM. HOLLIS.
Hendon.—Garrick-rd., three freehold building plots 265
Finchley.—Squires-la., "Upton Lodge," u.t. 90 yrs., g.r. 9*l.*, e.r. 55*l.* 380

By INMAN & CRIER.
Maida-hill.—23, Lanark-villas, u.t. 46½ yrs., g.r. 5*l.*, y.r. 40*l.* 485
St. John's Wood.—6, Bolton-rd., u.t. 46 yrs., g.r. 10*l.* 10s., w.r. 76*l.* 14s. 350

By MULLETT, BOOKER, & Co.
Hyde Park.—12, Sussex Mews West, u.t. 30½ yrs., g.r. 1*l.*, e.r. 40*l.* 250

By A. R. PEACEY.
Harrow, Middlesex.—1, York-ter., u.t. 96½ yrs., g.r. 6*l.*, e.r. 30*l.* 290

By G. RAMUZ.
Basildon, Essex.—Main-rd., etc., portions of the "Barstable Hall Estate," 29 a. 2 r. 31 p., f. (in lots) 850

By F. J. STAINES.
Bethnal Green.—43 and 45, Mowlem-st., u.t. 18 yrs., g.r. 19*l.*, w.r. 64*l.* 16s. 165
Hackney.—4, Handley-rd., u.t. 35 yrs., g.r. 4*l.* 10s., y.r. 30*l.* 275
Stoke Newington.—1, 3, and 5, Lordship-rd., u.t. 15 yrs., g.r., etc., 4*l.* 17s. 6d., w.r. 70*l.* 4s. 235
Shoreditch.—46 and 48, Weymouth-ter., f., y.r. 72*l.* 990
Haggerston.—1 to 11 (odd), Ilva-pl., f., w.r. 135*l.* 4s. 1,090
Stepney.—James'-pl., f.g.r. 25*l.* 10s., reversion in 34½ yrs. 535

By TYSER, GREENWOOD, & CRIER.
Chiswick.—Riverview-rd., ten freehold building plots 1,200
33, Ellesmere-rd., u.t. 98 yrs., g.r. 10*l.* 10s., e.r. 65*l.* 700
Barnes.—7, Ranelagh-gdns., u.t. 90½ yrs., g.r. 8*l.*, p. 500
31, 41, 47, and 49, Elm Grove-rd., u.t. 90½ yrs., g.r. 28*l.*, y.r. 150*l.* 1,275

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

SATURDAY, JUNE 11.

St. Paul's Ecclesiological Society.—Visit to the Church of St. Mary-le-Bow, at 2.30 p.m., and afterwards to St. Mary Aldermary at 3.15, and St. Mildred, Bread-street, at 3.45, under the guidance of Mr. Philip Norman, F.S.A.

Architectural Association.—Second Summer Visit, to Colchester.

Edinburgh Architectural Association.—Visit to Castle Campbell, Dollar.

MONDAY, JUNE 13.

Institute of Sanitary Engineers, Limited.—Organising Committee at 3 o'clock; Examination and Literary Committee at 5 o'clock.

Incorporated British Institute of Certified Carpenters.—Visit to Messrs. Walkers, Parker, & Co.'s Lead Works, Belvedere-road, Lambeth. 6.45 p.m.

WEDNESDAY, JUNE 15.

Institute of Sanitary Engineers, Limited.—Election Committee at 3 o'clock; General Purposes and Finance Committee at 5 o'clock; Half-yearly General Meeting at 7 o'clock.

Builders' Foremen and Clerk of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.

THURSDAY, JUNE 16.

Surveyors' Institution.—Conversazione at the Natural History Museum, South Kensington. 9 to 12 p.m.

SATURDAY, JUNE 18.

Architectural Association.—Visit to Penshurst.

Edinburgh Architectural Association (Associates' Section).—Visit to Donibristle.

TO CORRESPONDENTS.

W. M. (Amounts should have been stated).—J. H. H. (We do not insert lists of tenders unless amounts are stated or the work is carried out at a schedule of prices).—C. O. M.—J. K.—E. T. F. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks.	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks ...	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" at railway depôt.
Red Wire Cuts ...	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire ...	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks.....	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats.....	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers...	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints.	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats.....	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers...	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "

BRICKS, &c.—(*Continued*).

	£ s. d.	
Splays, Chamferred, Squints, Second Quality White and Dipped Salt Glazed	14 0 0	per 1000 at railway depôt.
	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand.....	7 3	per yard, delivered.
Thames Ballast.....	6 0	" "
Best Portland Cement	30 0	per ton, "
Best Ground Blue Lias Lime	21 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. depôt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2	"

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks...	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality*

	s. d.	
Scappled random blocks	2 10	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "

HARD YORK—

Scappled random blocks	3 0	per ft. cube, "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides (slabs random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
" " " 6 in. sawn both sides		deld. rly. depôt
" " " landings	2 7	per ft. super. deld. rly. depôt
" " " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 first quality "	13 0 0	" "
20 × 12 " " "	13 15 0	" "
16 × 8 " " "	7 5 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 " "	6 12 6	" "
20 × 10 best Eureka unfading green .	15 17 6	" "
20 × 12 " "	18 7 6	" "
18 × 10 " "	13 5 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 12 6	" "
18 × 10 " "	9 12 6	" "
16 × 8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles .	42 0	per 1000 at rly. depôt.
Hip and Valley tiles ...	3 7	per doz. " "
Best Brosely tiles.....	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " "
Hip and Valley tiles ...	4 9	per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Stafford shire do. (Peakes).....	51 9	per 1000 " "
Do. Ornamental do.....	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles.....	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1000 " "
Do. pressed.....	47 6	" " "
Do. Ornamental do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4.....	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in....	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in....	8 10 0	9 10 0

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WOOD.—(*continued*).

		At per standard.
Foreign Sawn Boards—	£ s. d.	£ s. d.
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
3 in.	1 0 0	"
	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOINERS' WOOD.

		At per standard.
White Sea: first yellow deals, 3 in. by 11 in.	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks—per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, £ s. d.			or delivered, Railway Vans, per ton. £ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	...		7 5 0
Compound Girders, ordinary sections	8 2 6	...		9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	...		8 17 6
Flitch Plates	8 5 0	...		8 15 0
Cast Iron Columns and Stanchions including ordinary patterns...	7 2 6	...		8 5 6

METALS.

	Per ton, £ s. d.			in London. £ s. d.
Iron—				
Common Bars	7 5 0	...		7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0	...		8 5 0
Staffordshire "Marked Bars"	10 0 0	...		—
Mild Steel Bars	8 15 0	...		9 5 0
Hoop Iron, basis price	9 5 0	...		9 10 0
" " Galvanized	17 10 0	...		—
("And upwards, according to size and gauge.)				
Sheet Iron (Black)—				
Ordinary sizes to 20 g.	9 15 0	...		—
" " 24 g.	10 15 0	...		—
" " 26 g.	12 5 0	...		—
Sheet Iron, Galvanised, flat, ordinary quality—				
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	...		—
Ordinary sizes to 22 g. and 24 g.	13 5 0	...		—
" " 26 g.	14 5 0	...		—
Sheet Iron, Galvanised, flat, best quality—				
Ordinary sizes to 20 g.	16 0 0	...		—
" " 22 g. and 24 g.	16 10 0	...		—
" " 26 g.	18 0 0	...		—
Galvanised Corrugated Sheets—				
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0	...		—
" " 22 g. and 24 g.	13 0 0	...		—
" " 26 g.	13 15 0	...		—

METALS—*Continued.*

	Per ton, £ s. d.			in London. £ s. d.
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0	...		—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0	...		—
" " 26 g.	14 0 0	...		—
Cut nails, 3 in. to 6 in.	9 0 0	...		9 10 0
(Under 3 in., usual trade extras.)				

LEAD, &c.

	Per ton, £ s. d.			in London. £ s. d.
Lead—Sheet, English, 3lb. and up	14 10 0	...		—
Pipe in coils	15 0 0	...		—
Soil pipe	17 10 0	...		—
Compo pipe	17 10 0	...		—
Zinc—Sheet—				
Vieille Montagne ton	27 5 0	...		—
Silesian	27 0 0	...		—
Copper—				
Strong Sheet per lb.	0 0 10½	...		—
Thin " "	0 0 11½	...		—
Copper nails "	0 0 11	...		—
Brass—				
Strong Sheet "	0 0 10	...		—
Thin " "	0 0 11	...		—
Tin—English Ingots "	0 1 4	...		—
Solder—Plumbers' "	0 0 6½	...		—
Tinmen's "	0 0 8	...		—
Blowpipe "	0 0 9	...		—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
" fourths	1⅞d. " "
21 oz. thirds	3½d. " "
" fourths	2⅝d. " "
26 oz. thirds	4d. " "
" fourths	3⅛d. " "
32 oz. thirds	5d. " "
" fourths	4⅛d. " "
Fluted Sheet, 15 oz.	3d. " "
" 21 oz.	4d. " "
⅛ Hartley's Rolled Plate	1⅜d. " "
⅛ " " "	1⅞d. " "
" " " "	2⅜d. " "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 5
" " in drums	"	0 1 8
Boiled " in pipes or barrels	"	0 1 8
" " in drums	"	0 1 11
Turpentine, in barrels	"	0 3 7
" in drums	"	0 3 9
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	"	19 0 0
Best Linseed Oil Putty	per cwt.	0 6 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to J. MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BALLYCLOUGH (Ireland).—For erecting a dispensary residence at Ballyclough, Mallow, for the Guardians. Mr. E. Hayes, architect, Spa-walk, Mallow:—

C. Kelleter	£1,148 0	P. Murphy, 24, John-st., Cork*	£1,090 0
P. Kuffer	1,119 10		

BATHGATE.—For erecting a new church at Bathgate, for St. David's Congregation. Mr. J. Graham Fairley, architect, India-buildings, Edinburgh. Quantitities by Mr. Fairley, Ordained Surveyor, India-buildings, Edinburgh:—

Builders: W. Roberts & Sons, Bathgate	£2,898 4 2
Joiners: J. Spiers & Sons, Bathgate	1,319 10 5½
Slaters: J. Easton & Sons, Bathgate	164 8 0
Plasterers: J. Easton & Sons, Bathgate	30 19 0
Plumbers: R. Robertson & Sons, Bathgate	199 10 0
Painter: W. Heugh, Bathgate	59 18 0
Glaziers: Dickson & Walker, Edinburgh	67 12 6
Heating Engineers: D. Lowe & Sons, Edinburgh	173 10 7

[Total, £4,913 12s. 8½d.]

BELFAST.—For building new kitchen at main building of workhouse, for the Guardians. Messrs. Young & Mackenzie, civil engineers:—

Lowry & Percy	£2,095 0 0	McRoberts & Armstrong	£1,825 0 0
McCammond & Son	1,625 0 0	McIntyre Bros.	1,918 11 0
J. A. Gordon	1,675 0 0	W. Dowling, Belfast*	1,450 0 0
J. Kidd	1,682 10 0		

BRADFORD. — Accepted for rebuilding photographer's premises, Barkerend-road, for the Coe Collotype Co., Ltd. Mr. T. Leadley, architect, 3, Coleridge-place, Bradford. Quantities by architect:—

Mason, etc.: G. Hullah, North Wing, Bradford	£683
Joiner, etc.: J. Fortune, Adolphus-street Bradford	
Plumbers, etc.: W. Bollans & Son, Churchbank, Bradford	
Plasterer: W. Hargreaves, Peckover-street, Bradford	
Slaters: Hill & Nelson, Edmund-street, Bradford	
Ironfounder: F. Roberts, Victoria Foundry, Bramley, near Leeds	

BRANDON.—For outfall sewer and sewage disposal works for Brandon Colliery and Littleburn, near Durham; for the Urban District Council. Mr. J. E. Parker, C.E., Post Office-chambers, Newcastle-on-Tyne:—

G. T. Manners, Gilesgate, Durham* . . . £1,230

BRIGHTON.—For the supply of 5,000 ft. run, 12 in. by 6 in., granite flat kerb, and 5,000 ft. run, 12 in. by 6 in., granite flat channel, for the Town Council. Mr. F. J. C. May, Borough Engineer and Surveyor, Town Hall, Brighton:—

—	—	Flat Kerb 12 in. by 6 in. at per foot Run.	Flat Channe 11in. by 6 in. at per foot Run.
		s. d.	s. d.
Blichfeldt & Co.	Norway	1 1½	1 0¾
E. J. Van Praagh & Co., Ltd., London*	Norway	1 1¾	1 0¼
W. Griffith & Co., Ltd.	Norway	1 1¼	1 1
A. & F. Manuelle	Norway	1 1¾	1 1¼
Brookes, Ltd.	Norway	1 2¼	1 2
J. Brunton	Norway	1 5	1 4½

CLAYTON-LE-MOORS (Lancs.).—For paving, etc., Chequers-road, etc., for the Urban District Council. Mr. A. Dodgeon, Surveyor to Council. Quantities by Surveyor:—

J. C. Hindle, Blackburn* (schedule of prices).

CLAYTON-LE-MOORS.—For concreting sewer near Albion Mill, for the Urban District Council. Mr. A. Dodgeon, Surveyor to the Council. Quantities by Surveyor:—

J. Sharples, Accrington* (schedule of prices).

CLAYTON-LE-MOORS.—For constructing a brick culvert at Super Clough Tip, for the Urban District Council. Mr. A. Dodgeon, Surveyor to the Council. Quantities by Surveyor:—

J. Sharples, Accrington* (schedule of prices).

CLAYTON-LE-MOOR. — For paving portion of Whinney Hill-road, for the Urban District Council. Mr. A. Dodgeon, Surveyor to Council. Quantities by Surveyor:—

J. C. Hindle, Blackburn* (schedule of prices).

HALE.—For making-up Harrop-road, for the Urban District Council. Mr. T. Blagburn, Surveyor:—

M. Naylor & Sons	£1,779 7 0	J. Mitchell & Son	£1,125 10 0
Ex., T. Barber	1,409 0 0	G. Bozson	1,090 7 0
W. Woodfine	1,331 19 1	Bethell & Sons	1,082 13 9
Garner&Owen	1,275 14 0	S. Hutton, Stamford-rd., Bowdon*	1,048 1 6
J. Hamilton & Son	1,171 0 0		

HURSTBOURNE TARRANT (Hants.).—For additions to school at Hurstbourne Tarrant. Messrs. W. & G. A. Bell, architects, Andover:—

E. Godwin, Hurstbourne Tarrant* £460

IPSWICH.—For additions and alterations to the Laundry, St. John's Home, Freehold-road, for the Guardians. Mr. H. J. Wright, architect, 4, Museum-street, Ipswich:—

G. Grimwood & Sons, Princes-street, Ipswich* £997

LEIGH (Lancs.).—For the laying of about 2,750 yds. of cast-iron water-pipes, for the Gas and Water Committee. Mr. J. Gibson, gas and water engineer, Leigh, Lancashire:—

P. O'Malla	£1,685 0 0	Bennie & Thompson	£874 2 6
T. Turner	1,052 13 4	J. Downham	813 17 4
J. Farrel	1,015 0 0	P. & S. Kearsley, 198, Twist-lane, Leigh*	762 1 8
F. E. Applegate	1,004 12 6		
W. Jowett	989 8 4		
T. Rowland	926 4 2		
Holme & King	878 0 0		

LINGWOOD (Norfolk).—For erecting a villa residence. Mr. Arthur J. Chambers, architect and surveyor, Norwich:—

J. Gedge	£978 0 0	W. G. Plumb	£776 10 0
R. Bayes	976 0 0	R. W. Riches, Postwick*	751 0 0
J. J. Howes	850 0 0		
J. J. Ainslie	841 0 0		

[Architect's estimate, £830.]

LLANELLY.—For sewering of the Forge district and Pembrey-road, for the Urban District Council. Mr. G. Watkeys, C.E., Town Hall, Llanelly:—

T. P. Jones	£3,200 0	G. Mercer	£2,985 17
F. J. Vivian	3,072 13		

[The Council decided to carry out the work themselves.]

TENDERS—*Continued on page 649.*

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CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Townshend-avenue Works (Section 2)	Devonport Borough Council	J. F. Burns, Boro' Surv., Municipal Offices, 29, Ker-st., Devonport	June 11
Lane between Barton & Townshend-av. (Street Works)	do.	do.	do.
Road Works, Barton-avenue (Section 3)	do.	do.	do.
Rebuilding Part of Retort House, Droylsden	Manchester Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester	do.
Police Station, Drighlington, near Bradford	West Riding County Council	J. Vickers Edwards, County Architect, Wakefield	June 13
Electric Light Installation at Car Depot	Colchester Corporation	A. R. Sillar, Boro' Electrical Engineer, 36, Stanwell-st., Colchester	do.
500 tons of Nowegian Granite Setts	Cleckheaton U.D.C.	J. Armitage, Clerk, Town Hall, Cleckheaton	do.
Cleansing of Ashpits	Whickham U.D.C.	J. B. Renton, Surveyor, Council Offices, Whickham	do.
Stores for Workhouse, etc.	Leicester Guardians	Poor Law Offices, Pocklington's-walk, Leicester	do.
Infants' School, Thornton-lane	Bradford Education Committee	Architect's Department, Education Office, Manor-row, Bradford	do.
Thirty-three Houses, etc., Tynewydd Estate, Porth	Mr. W. T. Davies	Lewis & Morgan, Architects, Market-square, Pontypridd	do.
C.I. Pipes (Collingham Water Supply)	Newark R.D.C.	H. Walker & Son, Engineers, Albion-ch'mb's, King-st., Nottingham	do.
Pair of Semi-detached Villas, Moy-road, Aberfan		W. Dowdeswell, Architect, Treharris	do.
Rebuilding the Queen's Theatre, Gateshead-on-Tyne	Messrs. Bolam & Bacon	J. W. Frazer & Corking, Architects, 49, Grey-street, Newcastle	June 14
Painting Public Lamps	Hertford Corporation	Borough Surveyor's Office, Hertford	do.
Workshop at Workhouse	Cannock Guardians	A. Veall, Architect, 84, Darlington-street, Wolverhampton	do.
Reinstating Floors at Isolation Block	do.	do.	do.
Painting, etc., at Five Elementary Schools	Carlisle Education Committee	H. C. Marks, Surveyor, 36, Fisher-street, Carlisle	do.
Four Villas at Aberbargoed	The Powell Duffryn Steam Coal Co.	G. Kenshole, Architect, Station-road, Bargoed	do.
Rebuilding the Quarry Arms, Aberbargoed	Mr. D. F. Pritchard	do.	do.
Twenty Dwelling-houses, Plas Farm, Pengam	Pengam No. 3 Building Club	do.	do.
Ambulance Shed, etc., Warwick-road Hospital	Banbury Town Council	N. H. Dawson, Borough Surveyor, Town Hall, Banbury	do.
Iron Fence, Warwick-road Hospital	do.	do.	do.
Hauling and Horse Hire	Kingswood U.D.C.	H. D. Strange, Surveyor, Council Offices, Kingswood, Bristol	do.
External Painting of Cork District Lunatic Asylum		W. H. Hill & Son, Architects, 28, South-Mall, Cork	do.
Six Cottages, Mayfield-road, Bridlington	Mr. S. Dyer	S. Dyer, Architect, 29, Quay-road, Bridlington	do.
Two Houses, Derby-street, Barnsley	Mr. M. Fowler	A. Whitaker, Architect, Worsborough Bridge, Barnsley	do.
Alterations, Holy Trinity Girls' School, Barnstaple		J. C. Southcombe, Architect and Surveyor, Barnstaple	do.
Twenty-five Double-hung Windows, Infirmary Wkhse	Ardee Guardians	The Architect, Laurence-street, Drogheda	do.
*Works of Street Improvement	Bromley Borough Council	Borough Engineer, Municipal Offices, Bromley, Kent	do.
Police Station Buildings, Oldbury	Standing Joint Committee, Worc.	H. Rowe, County Surveyor, Worcester	June 15
Roofs, Seats, etc., in Sebergham Church, Cumberland		J. H. Martindale, Architect, Viaduct-chambers, Carlisle	do.
Painting, etc., at Infirmary, Farnham	Guardians	Friend & Lloyd, Architects, Aldershot	do.
Wrought Iron Roundbars, etc.	East Indian Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Caretaker's Cottage, etc., Bluebell Graveyard	South Dublin R.D.C.	T. J. Byrne, Surveyor, 1, James-street, Dublin	do.
Cloak Rooms at Buddle Schools, Wallsend	Wallsend Corporation	G. Hollings, Borough Surveyor's Office, High-street, Wallsend	do.
Drainage Works, Headington and Cowley	Headington R.D.C.	H. H. Humphreys, Engineer, 28, Victoria-street, Westminster	do.
Stores	Metropolitan Asylums Board	T. Duncombe Mann, Office of the Board, Victoria Embankm't, E.C.	do.
Twelve Dwelling Houses, Doncaster-road, Thurnscoe	Mr. W. Morton	J. R. Dodds, Engineer, 22, St. Mary's-road, Wheatley, Doncaster	do.
Stables, etc., Hart-street	Brentwood U.D.C.	J. E. Fothergill, Town Hall, Brentwood	do.
Two Cottages, Southwell		W. Vickers, Southwell	do.
Granite	Northfleet U.D.C.	Office of the Surveyor, The Hill, Northfleet	do.
Stores and Materials	Heywood & Middleton Water Board	J. Diggle, Water Engineer, Water Board Offices, Heywood	June 15
Cast Iron Pipes	Rhondda U.D.C.	O. Thomas, Gas and Water Offices, Pentre, Glam.	do.
Rebuilding Small Bridges	Inverness-shire County Council	A. Mackenzie, C.E., Surveyor, County Buildings, Kingussie	do.
Additions to Freston School		Bisshopp & Cautley, Architects, 32, Museum-street, Ipswich	do.
Kentish Ragstone	Newhaven R.D.C.	W. Gates, Clerk, 86, High-street, Lewes	do.
C.I. Water Mains	Rugby U.D.C.	D. G. Macdonald, Surveyor, Rugby	do.
Additions, Nurses' Home, Woodland-rd., Barry Dock		W. E. Knapman, Architect, Pembroke-chambers, Barry Dock	do.
Billiard Room, etc., at South Moor, Durham	Mr. M. Martin	G. T. Wilson, Architect, 21, Durham-road, Blackhill, co. Durham	do.
Foundations, etc., Isolation Block, Small Pox Hospital	Scarborough Town Council	H. W. Smith, Boro' Engineer and Surv., Town Hall, Scarborough	do.
Wesleyan Chapel, Horninglow		Rowland & Sons, 32, Union-street, Burton-on-Trent	do.
Repairing, Paint., etc., Siloam Chapel, Pentre-Estyll		At the Chapel House	do.
Two Dwelling-houses, North-road, Wingate	Durham Miners' Association	F. Grant, Secretary, North-road, Wingate	June 17
Athletic Ground Work, Jordan Hill	Glasgow Academical Club	Kyle & Frew, C.E., 216, West George-street, Glasgow	do.
Manhole and Culverting	Church Stretton U.D.C.	S. Gingell Jones, Surveyor, 26, Castle-street, Shrewsbury	do.
Sawn Pitch-Pine Logs, Caversham Lock, Reading	Thames Conservancy	Conservators' Offices, Victoria Embankment, E.C.	do.
*New Coastguard Detachment, Speeton, Yorkshire	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
*New Coastguard Buildings, Prawle Point, S. Devon	do.	do.	do.
*Supply Steam Piping to Laundry, etc., at Workhouse	St. George in the East Guardians	Clerk's Office, Raine-street, Old Gravel-lane, E.	do.
Byre, Cumberland, etc., Lunatic Asylum	Asylum Committee	G. D. Oliver, County Architect, Carlisle	June 18
Telephone & Fire Alarm Install., Asylums, Bridgend	Glamorgan County Asylum Com.	W. E. R. Allen, Clerk to Com. of Visitors, Glam. C.C. Offices, Cardiff	do.
Cottage, Coventry-road, Lutterworth	Coventry General Charities Trustees	H. Chattaway, Architect, Trinity Churchyard, Coventry	do.
Public Convenience	Edinburgh City Council	Burgh Engineer, City-chambers, Edinburgh	do.
Reconstruction of Market Buildings, Bridgend	Rt. Hon. Earl of Dunraven	H. Martin & Son, Architects, 26, Paradise-street, Birmingham	do.
Six Shops	do.	do.	do.
Constructional Ironwork at Market, Bridgend	do.	do.	do.
Stores	Manchester Electricity Committee	F. E. Hughes, Sec., Elec. Department, Town Hall, Manchester	do.
Extension of Water Mains, Cheslyn Hay	Cannock R.D.C.	H. M. Whitehead, Engineer to Council, Penkridge, Stafford	do.
Carlesmoor Tunnel Bricks, Masham Scheme	Harrogate Corporation	E. W. Dixon, Engineer, 14, Albert-street, Harrogate	do.
12-ton Road Roller and Scarifier	Guildford R.D.C.	J. Anstee, C.E., Council's Offices, Commercial-road, Guildford	do.
Car Wheels and Axles	Manchester Tramways Committee	J. M. M'Elroy, Tramways Department, 55, Piccadilly, Manchester	do.
Repairs to Cemetery Wall, Chapel Hill	Basingstoke Burial Board	F. R. Phillips, Surveyor to the Board, Basingstoke	do.
Making-up of Streets	Stretford U.D.C.	E. Worrall, Surveyor, Council Offices, Old Trafford	June 20
Vicarage and Stable, Kimbolton		Nicholson & Hartree, Architects, Hereford	do.
Stores	Leeds Gas Committee	R. H. Townsley, Gas Offices, Leeds	do.
Pumping Plant	Huddersfield Corporation	J. W. Schofield, Waterworks Manager, Town Hall, Huddersfield	do.
Pitch Pine Partition Screen	Darlington Education Committee	A. C. Coffin, Secretary, Education Office, Darlington	do.
Painting, etc., Elementary Schools & Technical Coll.	do.	do.	do.
Lancashire Boiler (27 ft. by 7 ft.)	Blackpool Sanitary Committee	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
Disinfector	do.	do.	do.
Laundry Machinery and Fittings	do.	do.	do.
Play-shed, Portland-road School, Halifax	Education Committee	J. Lord, C.E., Town Hall, Halifax	do.
Stores	G.W.Ry. Co.	G. K. Mills, Secretary, Paddington Station, London	do.
Private Street Works	Pontypridd U.D.C.	P. R. A. Willoughby, A.M.Inst.C.E., District C'l Offices, Pontypridd	do.
Pumping Station, Cranham-lane, Upminster	Romford R.D.C.	J. Simmons, M.Inst.C.E., Bank-chambers, Doncaster	do.
Granite	Ely U.D.C.	W. McKelvie, City Surveyor's Office, Ely	do.
Stone and Concrete Bridge at Wainsford	Lymington R.D.C.	J. D. Rawlins, Clerk, 38, High-street, Lymington	do.
School, Park-road, Abertillery		W. Beddoe Rees, A.R.I.B.A., 37, St. Mary-street, Cardiff	do.
C.I. Pipes, etc.	Keighley Gas Committee	J. Laycock, Gas Engineer, Gas Offices, Cook-lane, Keighley	do.
Alterations, etc., to Council School, Gilberdike	East Riding Education Committee	Clerk of Works, County Hall, Beverley	do.
Sewering Alma and Lawn Mills, Kimberley	Basford R.D.C.	S. Maylan, Engineer, Public Offices, Basford	do.
Church at Selma, Ledaig		G. W. Brennan, M.Inst.C.E., Architect	do.
Shop and House, Dundalk	Messrs. P. & T. M'Cann	J. F. M'Gahon, Architect, 3, Earl-street, Dundalk	do.
Sewer, Longley-lane, Northenden	Bucklow R.D.C.	J. McKenzie, Surveyor, 7, Market-street, Altrincham	June 21
Road Works (Separate Contracts)	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford	do.
Conservative Club, Edenfield		F. J. Hobson, Architect, Rawtenstall	do.
*Painting and Decorating Shoreditch Town Hall	Shoreditch Borough Council	Borough Surveyor, Town Hall, Old-street, E.C.	do.
*Paving Works	Corporation of London	Engineer to Corporation, Guildhall, E.C.	do.
*Painting, Sanitary Alterations, etc., at Infirmary	Paddington Guardians	E. Howley Sim, Architect, 8, Craig's-court, Charing Cross, W.C.	do.
*Straw Loft, etc., to Stables, Liverpool-road, N.	Islington Borough Council	Borough Engineer, Town Hall, Upper-street, N.	do.
Tar Paving, Northampton Park, N.	do.	do.	do.
*Road-making and Paving Works	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Sewer Works, Trafalgar-sq., Regent-st., and Bond-st.	City of Westminster	Works Dept., Westminster City Hall, Charing Cross-road, W.C.	do.
*Alterations, etc., to Arthur-street Workhouse	Chelsea Guardians	Lansdell & Harrison, 66, Basinghall-street, E.C.	do.
Stores	Manchester Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester	June 22
Stores	Graigola-Merthyr Co.	Offices of the Company, Swansea	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
100 lineal yds. of Walling at Depot	Wembley U.D.C.	C. R. W. Chapman, Surveyor, Public Offices, Wembly	June 22
Corrugated Building for Temporary Hospital	Liversedge and Mirfield Jt. Hos. Bd.	E. Gill, Council Offices, Mirfield	do.
Foundations, Drainage, etc., for Temporary Hospital	do.	do.	do.
Public Library, Neath	Neath Corporation	D. M. Jenkins, Borough Engineer, Neath	do.
Bacon Curing, etc., Store, Aspatria	Industrial Co-operative Society	J. Lawson, Secretary, 32, King-street, Aspatria	do.
*Erection of Small House at Islington Infirmary	Islington Guardians	W. Smith, Architect, 65, Chancery-lane, W.C.	June 23
Belgrave Sewerage (Contract No. 2)	Leicester Corporation	E. G. Mawbey, Borough Engineer, Town Hall, Leicester	do.
Eltringham Sewerage and Sewage Disposal	Hexham R.D.C.	J. E. Parker, C.E., Post Office-chambers, Newcastle-on-Tyne	do.
Granite	North Walsham U.D.C.	E. J. Simpson, Surveyor, North Walsham	do.
Bible Christian Schoolroom, Bratton Fleming	.....	39, Fort-street, Barnstaple	do.
*Extension of Isolation Hospital	Ealing Town Council	Borough Engineer, Town Hall, Ealing, W.	do.
*New Coastguard Buildings	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	June 24
Kitchen, Bangour Village Asylum	Edinburgh District Lunacy Board	Hippolyte J. Blanc, R.S.A., 25, Rutland-square, Edinburgh	June 2
Engineers	G.N. Ry. Co. (Ireland)	T. Morrison, Secretary, Amiens-street Terminus, Dublin	June 27
600 Tons of Granite	Braintree U.D.C.	H. H. Nankivill, Surveyor, Vestry Hall, Braintree	do.
210 yds. of Pipe Sewer	Witham U.D.C.	W. P. Perkins, Surveyor, District Council Offices, Witham	do.
Calvinistic Methodist Chapel at Groes, Penycae	.....	53, Chapel-street, Penycae, Ruabon	do.
Asphalting Yards at Workhouse	Cannock Guardians	E. C. Jones, Union Workhouse, Cannock	June 28
Passenger Carriages, etc.	Donegal Ry. Co.	General Manager and Loco. Superintendent, Stranorlar, co. Donegal	do.
*New Offices, Bishop's-road, Paddington	G.W.Ry. Co.	Engineer, Paddington Station, W.	do.
*Sewerage and Sewage Disposal Works	Watford R.D.C.	E. Lailey, 9, Market-street, Watford	do.
*Addit., Decorating Work, etc., Public Baths, Ratcliff	Stepney Borough Council	Borough Engineer, 15, Great Alie-street, E.	do.
*Enlargement of Parcel Office, Ipswich	Commissioners of H.M. Works	H.M. Office of Works, Storey's Gate, S.W.	do.
Reconstruction of Sewers, Cannon's-lane, Pinner	Hendon R.D.C.	J. A. Webb, Engineer to Council, Stanmore	June 29
*Syphon Under New River, Bounds Green-road	Wood Green U.D.C.	Council's Engineer, Town Hall, Wood Green, N.	do.
*Erection of Public Library, Herne Hill	Lambeth Borough Council	H. Wakeford & Sons, 267, Clapham-road S.W.	June 30
Painting Bridges, East Sussex	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes	July 1
*New Coastguard Build'gs, Cliffe Creek, nr. Gravesend	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
*New Coastguard Buildings at Boscastle	do.	Superintending Civil Engineer, H.M. Dockyard, Devonport	do.
Two Stone Bridges, Cotehill	Carlisle R.D.C.	J. Graham, Engineer, Bank-chambers, Bank-street, Carlisle	July
500 yds. of Flints	Steyning West R.D.C.	E. Cripps, Clerk, Council Offices, New Shoreham, Sussex	July 4
Works at Gortnasate, co. Donegal	Board of Public Works	District Office of Works, Londonderry	do.
Pipe Laying (Contract No. 6)	Bridgwater R.D.C.	Rural District Council Offices, Bridgwater	do.
C.I. Pipes (Contract No. 5)	do.	do.	do.
*Redecorating Limehouse Public Library	Stepney Borough Council	Borough Engineer, 15, Great Alie-street, E.	do.
Road Metal	Rochester Corporation	W. Banks, City Surveyor, Rochester	July 1
Reconstruction of Dorchester Wesleyan Ch. & Schools	.....	W. E. Dibben, 40, Icen-way, Dorchester	do.
Rails, Fishplates, and Bolts	Erith U.D.C.	C. H. Fry, Clerk, District Council Offices, Erith, Kent	July
Permanent Way Construction	do.	do.	do.
Secondary and Elementary Schools, Rotton Park	Birmingham Education Committee	A. Rowse, Surveyor, 3, Newhall-street, Birmingham	July 1
Road Metal	Lewes Town Council	Borough Surveyor's Office, Town Hall, Lewes	July 23
Branch Railway to Pits on Craig Estate	.....	Eglinton Iron Works Office, Kilwinning	No date.
Alteration to Nurses' Home, Withington	Chorlton Guardians	J. B. Broadbent, A.R.I.B.A., 15, Cooper-street, Manchester	do.
Schools, Blythe Marsh	Trustees, Wesleyan Methodist Ch.	W. Wood, Architect, Longton	do.
House, Gainford	.....	E. G. Besant, A.R.I.B.A., Ravenswood, Cherryhinton-rd., Camb.	do.
Clean. & Decor. Nebottle Parish Church, Fence Houses	.....	The Vicar	do.
Six Houses, Stranmillis, Belfast	.....	R. A. Boyd, Architect, 22, Lombard-street, Belfast	do.
Heating, Ventilating St. Bridge's Church, Old Trafford	Rector and Wardens	The Rector	do.
Cleaning and Redecorating do.	do.	do.	do.
Additions to St. Mary's Church, Chepstow	.....	J. Coates Carter, F.R.I.B.A., Bank-buildings, Cardiff	do.
Wind Engine and Pumps	Carlisle R.D.C.	J. Graham, Engineer, Bank-chambers, Bank-street, Carlisle	do.
Collecting Tank and Reservoir, Cargo	do.	do.	do.
1,860 yds. c.i. Water Mains, Cargo	do.	do.	do.
234 yds. of Pipes in Wet Ground	Grimsby Corporation	H. Gilbert Whyatt, Borough Engineer, Town Hall, Grimsby	do.
Road and Sewer at Fishponds	.....	W. P. Saunders, Architect, Rupert-chambers, Quay-street, Bristol	do.
Excavating and Ballasting New Streets at Penygraig	.....	Lawrence, Bassett, & Walker, 6, Park-place, Cardiff	do.
*Additions to Electricity Works	Dover Corporation	Borough Electrical Engineer, Park-street, Dover	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Drawing Office Assistant	Northampton Institute, E.C.	Not Stated	June 11
*Works Foreman	Hull Corporation	150*l.*	June 20
*Clerk of Works	Staffs. Education Committee	150*l.*	June 25

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, —. *Contracts*, iv. vi. viii. x. *Public Appointments*, xviii.

TENDERS.—*Continued from page* 647.

LITTLEHAMPTON.—For paving works, for the Urban District Council. Mr. H. Howard, Surveyor, Town Offices, Littlehampton. Quantities by the Surveyor:—

A. C. Joan ..	£678	3	6	Patent Victoria Stone Co., Ltd. ..	£485 11 10
E. H. King ..	669	0	0		
D. E. Delaney	599	2	4		
A. T. Catley ..	584	11	10	E. G. Holland, 30, High-st., Littlehampton* ..	461 0 0
Grounds & Newton	555	0	5		
W. Wallis	530	10	0		

LLANELLY.—For 1,100 yards of 24-inch c.i. pipes, etc., for the Urban District Council. Mr. G. Watkeys, C.E., Town Hall, Llanelly:—

	Per ton.
C. Jordan & Co.	£4 19 10
R. Maclaren & Co.	4 17 0
T. Spittle & Co.	4 16 6
Stavely Coal and Iron Co., Ltd.	4 15 0
Macfarlane, Strang, & Co.	4 15 0
Sheepdale Coal & Iron Co., Ltd.	4 14 0
A. G. Cloake	4 13 6
Holwell Iron Co., Ltd.	4 13 0
D. F. Stewart & Co., Ltd.	4 13 0
I. & S. Roberts & Co.	4 12 6
Stanton Iron Works Co.	4 11 6
Cochrane & Co., Dudley*	4 10 0

LLANDOUGH.—For erecting a house, for Mr. J. Lloyd Roach. Mr. J. H. Thomas, Surveyor, Pentwyn, Llandaff:—

G. H. Elkington	£1,066	10	9	J. Pugh	£798 0 0
W. Cox	880	0	0	J. Britton, Dinas Powis*‡	720 0 0
J. Charles ..	835	0	0	T. Bevan	696 18 9

‡ Accepted at £720 (revised amount includes price for an additional bedroom).

LONDON.—For rebuilding 16, Ormond-yard, Queen-square, W.C., for Mr. W. C. Gidden. Mr. T. Wilson, architect, 34, New Bridge-street, E.C.:—

Williams	£1,700	Coleman & Co.....	£1,256
Patman & Fotheringham, Ltd. ..	1,473	Leslie & Co., Ltd. (too late)	1,234
C. Wall & Co., Ltd.	1,337	J. Chessum & Son*	1,195
Lidstone	1,282		

LONDON.—For the erection of casual wards and receiving workhouse at Sheffield-st. and Portsmouth-st., W.C., for the Guardians of the Poor of the Strand Union. Mr. A. A. Kekwich, architect, 18, Outer Temple, W.C.:—

J. F. Holliday	£31,000	Treasure & Son ..	£27,597
Leslie & Co.....	29,735	F. G. Minter	27,596
Wells & Co.....	29,561	H. L. Holloway ..	27,430
Appleby & Sons ..	28,790	A. Monk, Lower Edmonton*	26,739
W. Wallis	28,400	Page & Son.....	26,300
Foster Brothers ..	28,376		
Lawrence & Son ..	28,292		

LONDON. — For additions to Fairfax Dancing Academy, Portland Gardens, Harringay, N. Messrs. Warran & Stupart, architects, 78, Grand-parade, Green Lanes, N.:—

J. C. Haward	£1,536 5 3	C. Hale & Co.	£985 0 0
W. Lawrence & Son	1,169 0 0	W. Simmonds	955 0 0
J. Middleton	1,025 0 0	Rowley Bros., Tottenham*	900 0 0
E. G. Benson	1,024 11 0		

[Architects' estimate, £984.]

LONDON.—For erecting a verandah outside the infants' nursery at workhouse, Reeves-place, N., for the Guardians of the Poor of the Parish of St. Leonard, Shoreditch. Mr. F. J. Smith, architect, Parliament-mansions, Victoria-street, S.W.:—

J. Ivory, 102, Great-Cambridge-street, E. £259 15

LONDON.—For 345,000 Jarrah wood paving blocks, for the St. Pancras Borough Council. Mr. W. N. Blair, Engineer and Surveyor, Town Hall, St. Pancras:—

	5-in. Jarrah blocks, per 1,000.	4-in. Jarrah blocks, per 1,000.
Improved Wood Pavement Co.*	£11 2 6	£9 2 6
W. Griffiths	11 9 9	9 7 0
Acme Flooring & Paving Co.	11 6 0	9 2 0
Millar's Karri & Jarrah Co.	11 15 6	9 12 6
B. G. Elliott	11 13 0	9 9 0

LONDON.—For the extension of the Telegraph Factory at Holloway, for the Commissioners of H.M. Works and Public Buildings:—

	£ s. d.	Credit Old Materials. £ s. d.
H. Lovatt, Ltd.	10,900 0 0	55 0 0
Stephens, Bastow, & Co., Ltd.	9,584 0 0	—
G. Newton	9,195 0 0	9 0 0
C. Miskin & Sons	8,882 0 0	60 0 0
W. J. Renshaw	8,724 0 0	50 0 0
H. L. Holloway	8,600 0 0	28 0 0
J. Mowlem & Co., Ltd.	8,290 0 0	—
J. C. Richards & Co.	8,225 0 0	50 0 0
J. Appleby & Sons	8,210 0 0	100 0 0
Perry & Co.	8,194 0 0	70 0 0
J. Wilmott & Sons	8,176 0 0	50 0 0
L. Whitehead & Co., Ltd.	8,150 0 0	50 0 0
C. Ansell	8,080 0 0	100 0 0
W. Jones & Sons, Ltd.	8,012 5 4	50 0 0
W. Pattinson & Son	7,981 0 0	43 0 0
C. P. Roberts	7,899 0 0	48 0 0
F. & A. Willmott	7,868 0 0	35 5 0
Leslie & Co., Ltd.	7,849 0 0	162 0 0
Galbraith Bros.	7,788 0 0	88 0 0
Cowley & Drake	7,704 0 0	109 0 0
B. E. Nightingale	7,509 0 0	35 0 0
Perry Bros.	7,477 0 0	100 0 0
Foster Bros.	7,315 0 0	100 0 0

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NAPSBURY (Herts).—For electric [wiring and fittings at Napsbury Asylum, near St. Albans, for the Visiting Committee. Mr. W. H. Massey, M.Inst.C.E., 25, Queen Anne's-gate, Westminster, S.W.:—

Hampton & Sons	£11,955	0	
F. Suter & Co., Ltd.	9,274	0	
Wippell Bros. & Row	8,000	0	
Allom Bros.	7,769	14	
Comyn, Ching, & Co.	7,700	0	
Simmonds Bros., Ltd.	7,438	0	
Strode & Co.	7,287	0	
D. Hulett & Co., Ltd.	7,062	0	
Wenham & Waters, Ltd.	£6,549	0	
W. J. Fryer & Co.	6,163	0	
Belshaw & Co.	6,000	0	
Wells, Rayner, & Co.*	5,343	0	
H. H. & J. Pearson, Ltd.	5,022	0	
T. Potter & Sons	4,496	0	
Jones & Spence	3,200	0	

PLYMOUTH.—For fitting-up hot-water heating apparatus and gas installation at the Technical Schools, for the Education Authority. Mr. H. J. Snell, architect, 11, The Crescent, Plymouth:—

W. T. Hocking, Saltash-street £820

PORTH.—For enlarging the Tabernacle (English) Baptist Chapel, Hannah-street, for the Trustees of the Chapel. Mr. D. W. Jones, architect and surveyor, Porth:—

C. Jenkins & Son	£1,770	R. Burnell, Builder, Ynyshir, Porth*	£1,280
Moore & Elsworthy	1,650		

RIPON.—For erecting sulphur baths in Park-street, for the Corporation. Mr. S. Stead, architect, Victoria-chambers, James-street, Harrogate:—

Mason and Bricklayer: Barker Bros., Hampsthwaite	£2,560	0	0
Carpenter and Joiner: J. H. Coldbeck, Ripon	854	10	0
Plumber and Glazier: S. Rushworth, Shipley	830	0	0
Plasterer: Fortune & Calverley, Harrogate	217	15	0
Slater: Baynes & Beck, Ripon	170	0	0
Painter: J. S. Lowley, Ripon	110	0	0

SENGHENYDD.—For building a Welsh church at Senghenydd, near Cardiff, for the Trustees. Mr. P. Vivian Jones, architect and surveyor, Hengoed, near Cardiff:—

With Excavation.

D. C. Jones £772 10 10

Without Excavation (30l. extra for Excavation).

J. Williams £661 0 0

Without Excavation (25l. extra for Excavation).

R. Jones, Abertridwr* £638 10 0

[The members of the church have undertaken to do the excavation so as to save this expense.]

SHEFFIELD.—For heating apparatus for Malin Bridge Council School, for the Sheffield Education Committee. Mr. H. I. Potter, architect, 115, Norfolk-street, Sheffield:—

Dargue, Griffiths, & Co.	£551	0	
J. W. Wilson	448	7	
Bates & Sons	429	0	
Sheen, Stanley, & Co.	425	0	
A. Grindrod & Co.	420	0	
C. Pearce & Son	407	0	
H. Harvey	355	0	
Brightside Foundry and Engrg. Co., Ltd.	£319	0	
Wright Bros.	315	0	
Newton Chambers & Co., Ltd.	306	10	
Braithwaite & Co., Carver-street, Sheffield*	280	0	

SOUTHWICK (Sussex).—For extension of sewer in Church-lane, for the Urban District Council. Mr. G. W. Warr, Surveyor to Council, Southwick. Quantities by Surveyor:—

D. & J. Hall	£229	18	7
J. Whittington	185	1	0
W. Whiteman	181	13	6
W. A. McKellar	178	0	0
J. G. Pickhard	177	19	6
A. E. Soan‡	162	1	7
E. H. King	159	1	9
Woolgar Bros.	158	1	0
J. Parsons & Sons	£156	0	0
Peerless, Dennis, & Co., Langney-road, Eastbourne*	142	10	0

‡ £10 should be added for contingencies.

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STAINLAND.—For paving works, Station-road, for the Stainland-with-Old Lindley Urban District Council. Mr. J. H. Walker, Surveyor, Mechanics' Hall, Stainland:—

Halstead & Bainbridge, Claremount, Halifax*	At a Schedule of Prices.
Spencer Bros., Skircoat, Halifax	
Longbottom & Davidson, King Cross, Halifax	
R. Bowers, Halifax	
S. Bedford & Son, Huddersfield-road, Halifax	
Bellfield & Barnes, Lord-street, Sowerby Bridge	
Sidebottom & Brown, Cleckheaton	
Hill & White, Woodlands Mount, Huddersfield	

STRETFORD.—For a 400 K.W. steam-driven generator, for the Urban District Council. Messrs. T. L. Miller & Wilson, consulting engineers, 19, Brazenose-street, Manchester:—

Lancashire Dynamo & Motor Co., Ltd., Trafford Park, Manchester* £2,663

TREHARRIS.—For erecting thirteen houses, for the No. 2 Oakland Building Society. Messrs. Osborne & Rees, architects and surveyors, Nelson, Glam.:—

W. & D. Thomas, builders, Bedwas, Mon. £2,899

TUNSTALL.—For painting, decorating, etc., at Wesleyan Chapel, Wesley-place, for the Trustees. Mr. E. Jones, architect, 10, Albion-street, Hanley:—

W. H. Hawthorne	£550	0	0	A. Parr	£371	11	1
J. Moulton	470	7	6	J. Birchall	356	6	0
T. Hughes	446	5	2	Bennett Bros.	352	0	0
G. H. Moreton & Son, Ltd.	433	16	9	T. Adams, Hanley*	297	15	0
				G. Cross	292	6	10

[Based on quantities supplied by Architect.]

UPTON PARK.—For repairs to schools, for the St. George-in-the-East Guardians:—

H. C. Horswill, Green-street, Upton Park .. £249

WESTON-SUPER-MARE.—For new roads, drains, etc., on Bourneville Estate, for Mr. J. L. Poole. Messrs. Wansbrough, Sons, & Garner, surveyors. Quantities by Mr. J. S. Garner, Weston-super-Mare:—

W. A. Green	£1,149	Coles & Son	£854
Sprake	990	E. Monks	790
P. Hart & Son	905	Lloyd & Son, Weston-super-Mare*	750
Mereweather & Sons	899		

WINSFORD.—For erecting new stores at Newton Bank, for the Industrial Co-operative Society. Mr. T. Dutton, architect, Dingle-lane, Winsford:—

J. Fowles & Sons	£725	0	Birchall Bros., Middlewich*	£597	10

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The Builder.

VOL. LXXXVI.—No. 3202. JUNE 18, 1904.

ILLUSTRATION .

Sculpture at the Royal Academy :—
"The Sandal" ..... By Mr. F. M. Taubman.
"The Cup of Immortality" ..... By Mr. Albert Toft.
"Ariadne" ..... By Mr. Harold Parker.
"The Dancer" ..... By Mr. Bertram Mackennal.
"Labour" ..... By Mr. Alfred Turner.
Group for Lloyd's Registry ..... By Mr. F. Lynn Jenkins.
"Dante" ..... By Mr. A. G. Walker.
Lectern for Minehead Church ..... By Mr. Nelson Dawson.
Burton Hall, Cheshire ..... Messrs. Nicholson and Corlette, Architects.
"Framewood," Stoke Poges ..... Mr. Gerald C. Horsley, Architect.
Villa, St. Moritz, Engadine ..... Mr. H. Inigo Triggs, A.R.I.B.A., Architect.

Illustrations in Text.

Keystone, Royal Friendly Society's Building. By Mr. Alfred Drury, A.R.A. ..... Page 652

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Sculpture at the Royal Academy.

THE sculpture exhibition of this year at the Royal Academy begins, as all London knows, in the courtyard, where Mr. Watts's colossal equestrian group, "Physical Energy," is set up as the central object, a naked man on a naked horse: the two animals go remarkably well together. The horse seems to have been reined in sharply, and the man, with his hand partly shading his face, appears as if contemplating something before him which is to be undertaken, which is to be the object of his energy. There is immense power and vigour in the attitude and the physique of horse and rider, in the horse especially; if the modelling of the animal may seem rather rough, we may probably take it that this is not intended to be an exactly realistic reproduction of a horse, but to some extent purposely conventionalised into a sculpturesque translation of equine form and vigour, just as the head of the horse in the tympanum of the Parthenon was to a certain extent conventionalised by the Greek sculptor. A great deal of force is added to the head of the horse by the arrangement of the short upstanding mane so as to give an angle to the outline of his crest. As a matter of line, the group does not compose equally well in all directions; its best aspect is as seen from the left-hand side of the horse. But it is a work of genius, and most modern equestrian statues would seem comparatively feeble and mannered beside this symbol of strength and vigour translated into sculptural expression.

In the Octagon, the visitor is confronted by the marble edition of Mr. H. Pegram's "Sybilla Fatidica," before exhibited at the Academy in plaster, if we remember right. This work has been bought with the Chantrey Bequest, and the purchase is one of those which have been found fault with by the critics of the Academy in respect of their management of Chantrey's Trust. It is certain that the Academy, which has made most of its Chantrey purchases from among the pictures of each year and has paid little attention to sculpture, has in former years passed over works in sculpture which were better worth purchase. We should have liked, for instance, to have seen Mr. Colton's fine and poetic work, "The Crown of Love," exhibited in 1902, secured for the Chantrey collection. But we cannot say that we think the present purchase is not justifiable. The subject, perhaps, is not very interesting; but the figure of the nude young woman who hides her face on the knees of the sibyl, in dread of the result of the inquiry into her fate, is a very fine and powerful piece of sculptor's work, a modelling of the figure in a very difficult position. Mr. Mullins's life-size group of Isaac and Esau, also a marble repetition of a work before exhibited in plaster, might we should have thought have had equal claim to consideration; it is a finer subject and, in a decorative sense, a better composition; but it must be admitted that the difficulties to be grappled with were less, the problem simpler. Considering how little has hitherto been done for sculpture out of the Chantrey fund, both works might well have been purchased. But if only one work were to be selected out of this year's sculpture, we do not know that there is any one which has better claims than the "Sibylla," leaving out of consideration those which were special commissions, and therefore not available.

Among the works ranged around the Octagon we first notice two fine and broadly treated bronze figures by Mr. Alfred Turner, which are intended to form part of the Queen Victoria Memorial at Sheffield. Of the first of these, representing "Labour," we give an illustration. It is a fine and dignified figure of a man of Herculean strength, resting for a moment with his heavy hammer leaning against his knee. The sculptor has contrived to treat the realistic garb of labour with sculpturesque breadth, though we must say that we do not like boots in sculpture; they are better, however, in bronze than in marble. The other figure, "Maternity," that of a woman with two small children, is also treated finely as to the drapery and general composition, but the head is rather characterless. Between these is Mr. Pomeroy's kneeling figure of the late Archbishop of Canterbury, in a heavy brocaded robe, which falls into great folds in a very effective manner; the head is very fine, and with an expression of peace and benignity very suitable in a monumental figure, and happily at variance with the reputation for brusquerie which attached to the original during his lifetime.

The keystone to the new building for the Royal Friendly Society, by Mr. Drury, of which an illustration is subjoined, is a fine head, but the foliage which surrounds it is somewhat too

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Keystone, Royal Friendly Society's Building. By Mr. Alfred Drury, A.R.A.

naturalistic for combination with architectural decoration. Mr. Taubman's "The Sandal," of which we give an illustration (see plate), is one of those illustrations of a moment of human action, representing no idea save pure beauty of form and line, for which the art of sculpture is peculiarly adapted. There is no story, no special sentiment attached to this; it is a momentary pose of life caught and fixed by the sculptor. This is the class of work which represents sculpture in its purest and most abstract form: the least of all adapted to meet popular taste in this country, where people always want a story—an incident, and cannot understand that in sculpture pure beauty is an end in itself. Mr. Jennings's "Three Generations of Time" was one of the best works exhibited in the students' competition for the gold medal this year; we have already both described and illustrated it. Mr. H. Pegram exhibits a terra-cotta figure of "Pan," capital in the modelling of the figure with its goatish legs, but the head is too human, too pleasant, too modern for Pan, an ancient rural deity to whom something of the grotesque belongs; Pan is a purely Pagan conception, and this is not Pagan enough, there is a want of realisation of the antique spirit in it. From this we jump again to the world of modern realities in the shape of Mr. Brock's colossal statue of that great Anglo-Indian soldier John Nicholson, whose character and personality so impressed the native Indians that they regarded him and worshipped him as a god. This is the kind of thing that Mr. Brock does better than any one else. Nicholson is represented as holding his sword in one hand and the sheath with the other; the head is fine but perhaps rather too gentle in expression for one who was such a determined fighter; and the portraits which we know of Nicholson represent him with a beard fuller and squarer in cut than is shown here. As a memorial statue, however, it is a fine work; it is to be set up in bronze in the Nicholson Square at Delhi, in the storming of which city Nicholson lost his life. He was one of the greatest of England's sons, and well merited all that English art can do to commemorate him.

It seems a pity that sculpture at the Academy cannot be classified in its arrangement more, in regard to the nature of the subject. A personal memorial like that to Nicholson belongs so completely to another province from that of ideal sculpture that one can hardly judge the two types in the same category or on the same principles. Mr. Walker's statuette of Dante is a fine realisation of the sombre and thoughtful aspect which one can imagine proper to the author of the Divine Comedy; an illustration of it will be found in one of our plates. Mr. Lucchesi, in his small figure of Cupid under the title "The Surrender," reverts to the use of sculpture to point a moral; Cupid sits on a pile of moneybags, and breaks his bow as of no use in a domain ruled by Plutus; the expression given to the face is characteristic and almost pathetic.

On the remaining side of the Octagon are two or three works which represent the use of sculpture to express a poetic conception; its highest use, when combined with decorative beauty of form. Of one of these, Mr. Toft's "The Cup of Immortality," we give an illustration. This is a beautiful and imaginative work; a large panel in low relief, where a wizard-like venerable figure in long robes brings to a kneeling nude girl the cup of immortality. It is based, we believe, on an ancient Persian legend. In the panel formed beneath the architectural framework is the inscription "In his hand he bore a cup containing a crystal liquor which sparkled and foamed as if it would overleap its narrow bound." That is all the explanation of the subject, which is thus left vague, so that each may interpret the thought his own way; the best treatment of a poetic thought in sculpture, where too much definition of the subject is apt to become prosaic. This is one of the best works which Mr. Toft has produced. Near this is a fine bronze group, by Mr. J. H. M. Furse, of a winged angel with a child on its knee, the wings overshadowing the group; it is a memorial, probably to a child, which is to be set up in Hampstead churchyard. One is glad to think of anything so thoughtful and refined being placed in a London churchyard, where the monuments do not generally represent a high type of art. Mr. Mullins' "Isaac and Esau" we have already referred to; and on the other side of it is Mr. Fehr's bronze of "Isabella and the Pot of Basil," a new reading of the well-worn subject, and welcome as such. He has represented Isabella as a nude figure seated beside the flower-pot and bending her head over it; a treatment of course far more in accordance with the spirit of sculpture than a costumed figure, and yet not out of keeping with the poem, since Isabella's grief was indulged necessarily in solitude. The "pot" is finely treated, with a decorative surface modelling in which tragic masks are interwoven. Altogether a fine and interesting work.

Among the works which occupy the centre of the floor in the Lecture-room we find very various types of sculpture illustrated; in fact almost each work comes under a different category. Decorative and symbolical sculpture is first illustrated in Mr. Lynn Jenkins's "The Spirit of British Maritime Commerce," a group in bronze and marble forming part of a decorative scheme for the staircase at Lloyd's, and of which we give an illustration. It represents, as will be seen, the conventional ship, with attendant sea-nymphs, and a figure which may symbolise Commerce seated in the stern. The nude parts of this figure are in marble, the rest of the work bronze. It is difficult to judge of such a work apart from the whole scheme; but as a piece of purely decorative work on a small scale it seems very successful. Opposite to this we have a very fine example of portrait sculpture, in Mr. Brock's dignified figure of the late Chief Justice, seated and robed, and with the head carved in that broad manner, not weakened by over-finish, in which Mr. Brock excels. On the north side of the floor poetic sculpture is represented by Mr. Harold Parker's impassioned nude figure of Ariadne, "kneeling on her sad

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knee," as Byron said in his audacious rhyme, her hands flung forward in an action of despair. This is a pathetic and a rather new and original rendering of an old subject. We give an illustration of it on a small scale; it is life-size, and on the same scale therefore as "The Sandal" and "The Dancer" on the same plate, but the arrangement on the plate (the only one possible for getting all the subjects in) compelled its reduction. On each side of this are two works of the class which express simple life without emotion; Mr. A. J. Leslie's "Narcissus" and Mr. Mackennal's "Dancer." The former is a failure because it is not specially beautiful, as any representation of Narcissus ought to be, seeing that the whole legend turns upon his beauty. Mr. Mackennal's "Dancer," of which we give an illustration, is a fine and graceful figure, though in respect of the title it seems a little deficient in the sense of movement; possibly the sculptor was afraid of spoiling the repose of the figure if he put more action into it. It is a work representing some of the best traditions of sculpture, but its author has produced things which interested us more. Opposite to these two last-named figures of simple life, on the other side of the room, are two dealing with ideas of remorse and misery, the "Cain" of Mr. B. Clemens and the "Marsyas Defeated" of Mr. Basil Gotto. This dramatic placing and contrasting of the works according to the character of their subject is no doubt intentional, and is certainly effective. "Marsyas" does not harrow our feelings much; he has let his pipes fall, but otherwise he takes his defeat and its consequences very calmly. "Cain," flying from the avenger of blood, as it were, is a far more dramatic figure, in which action and remorseful expression are carried as far as they well can be in sculpture without disturbing its artistic balance. What is the figure executed in? Apparently in some material which shows red patches at intervals, as if of blood stains; or is it coloured up intentionally? In either case, the effect is disagreeable, and we could well have spared it. Between these two works comes the model for a monument to commemorate the King's Liverpool Regiment, by Mr. Goscombe John, which is as much architectural as sculptural; a stele with a figure on the top, and two curved wing-walls with figures at each end, represent a kind of scheme which is not new, but is suitable and effective.

Of the numerous works arranged round the walls the most important are Mr. Frampton's "St. George" and Mr. Derwent Wood's "Love and Life: Sacred and Profane," a large bas relief. The St. George, in gilt bronze, is an armoured half-size figure standing over the dead dragon, and gazing on it with an expression very different, at all events, from the conventional type of the victorious saint; the group forms part of a war memorial to be erected at Radley College. Mr. Derwent Wood's large panel, in very low relief, is a work representing both sculptural beauty and a good deal of thought; a warrior and a girl stand grouped together in the centre, each stretching one hand to one of the side groups; those representing Profane Love or Pagan Love, with their attendant Cupid, pass off to the left, the group representing Sacred Love passes off to the right. These two groups are finely contrasted; their precise relation to the centre group is not very clear—it seems rather like the old idea of the parting of the ways; but then, in this case as in another already referred to, we do not really want too much definition; it is better for the artist to leave us a little fancy-free.

Of other works there are many of more or less interest, to all of which it is impossible to refer. We must express our intense dislike to the grotesque work exhibited by Mr. Gilbert, under the title "The Mother of the Ninth Symphony," in which there seems to be an intention to represent in coloured materials the head of an old woman with a likeness to Beethoven. This is called "Study of a head for a contemplated monumental homage to Beethoven" (!) That is not the way to pay homage to Beethoven, and it makes one rather angry to find his great name associated with so ugly and absurd a production. Mr. Lynn Jenkins exhibits a female head in marble which does not exactly answer to the main title, "The Triumph of Youth," for there is no look of "triumph" in it, but does answer to Mr. Hewlett's couplet quoted with it—

"For body's beauty is thy soul's thin veil,
Wherethro' soul's beauty shineth like a jewel."

To say that a sculptor has really conveyed, in a marble bust, the idea suggested in those lines, of the soul expressed in and shining through the outward bodily semblance, is to say a great deal for his powers of spiritual expression in sculpture. We can just mention a few other things which are of special interest. Mr. Anning Bell's low-relief medallion, "The Fortune-teller," with its wrinkled drapery, looks as if it would be more effective if treated with the colour which he is fond of applying to plaster relief. Mr. Lantéri's bronze portrait statuette of "Miss Grant" is a very good example of ease and grace of attitude in a portrait statuette. Among the other small works is a charming little child's head, "Gracie," in silver relief, by Mr. Drury; Signor Canonica's busts of the King and Queen, which have that strongly marked individuality that characterises all this sculptor's works—perhaps rather too much; and Mr. Sydney Cowell's large circular medallion, "The dream spirit," where a figure in low relief is encircled by wings proceeding from a head at the top, is an interesting fancy. A small bronze group by Miss Florence Steele, in which a man, a winged woman, and a serpent, are combined, should not be passed over; no explanation is given, it is a little poem in bronze to which every one can give his own meaning. Two larger works of quasi-architectural interest are Mr. Hodge's bas-relief of "Science and Art," apparently for a panel in a building, and Mr. Reynolds-Stephens's "Reredos," with a figure of Christ in the centre. The former is purely sculptor's work, depending solely on form and design; the latter is a piece of decorative work in which various materials are combined. It is effective and original, but with perhaps rather too much of an obvious effort to be so, and the decorative tree forms in the side panels are rather too naturalistic in some of their details.

One cannot help remarking how far larger is the proportion of things that are really good and interesting in the sculpture exhibits than in the paintings. Of course the space given to sculpture is much smaller, far too small in fact; but one result is that a higher general standard of work is maintained. Perhaps if the Academy reduced also the number of pictures they would consent to hang, the result would be an improvement in the pictorial standard of the annual exhibitions.

NOTES.

'Architects' Certificates. THE case of Robins *v.* Goddard, tried by Mr. Justice Farwell last week, exemplifies once again the finality of architects' certificates. The final certificate in this instance had stated that a sum might be paid to the builder "in full settlement of all claims for extras and work under contract dated," etc. The house-owner refused to pay the sum stated in this final certificate on various grounds, such as that the work and materials were defective, imperfect, etc., and he relied on the thirtieth clause of the contract: "No certificate of the architect shall be considered conclusive evidence as to the sufficiency of any work or materials to which it relates, nor shall it relieve the contractor from his liability to make good all defects as provided by the agreement." If this clause were read by itself the house-owner would seem to have been in the right, but in the seventeenth clause the architect was given full powers as to defects and faults in the work, and the contractor was to make them good, "unless the architect shall decide that he ought to be paid for the same." Mr. Justice Farwell decided that looking to the contract as a whole the decision of the architect was final—in other words Clause 30 was merely intended to prevent interim certificates from having the effect of final certificates, and did not take away the absolute power intended to be given to the architect by previous provisions in the contract.

Water Supply for Domestic Purposes. THE case of the South-West Suburban Water Company *v.* St. Marylebone Union is one to be noted. The plaintiffs were a water company and the defendants the owners and occupiers of premises used as schools for the education of children from the workhouse. For some time by agreement water had been supplied to the defendants by meter through a communication pipe with a 3-in. bore, and the water was used—1, for garden and greenhouse; 2, for automatic flush cisterns; 3, continuous supply to urinals; 4, for boilers for driving machinery and pumping water; 5, for use in the laundries; 6, for washing out a large swimming bath. The defendants resolved to apply for a supply of water for domestic purposes only, at a charge based on the annual value of the premises, and as a condition to obtaining this supply offered to discontinue the use for the swimming bath. The plaintiff company, however, required them first to substitute for the 3-in. pipe a ½ in. service pipe, and to make other alterations to connect the supply with

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domestic purposes exclusive of the uses for other purposes. By section 12 of the Waterworks Clauses Act 1863, a supply of water for domestic purposes is not to include a supply for any "trade, manufacture, or business," and as was decided recently in a case commented on by us (Barnard Castle Urban District Council *v.* Wilson) a school is a "business." In the present case, however (as in the decision of the Court of Appeal in that case), it has been held that the fact that a business is carried on upon the premises does not permit water being used on the premises for domestic purposes, and therefore in each case there must be a question of fact to be decided as to the exact use the water is being put to. The learned judge in this case decided that the water company under the Acts and orders made under them was justified in insisting on a pipe or pipes with the bore for domestic purposes being substituted for the 3-in. pipe, and he went through the various uses to which the water was being put, and laid down which were and which were not "domestic purposes." As the Act of 1863 by section 12 excludes a supply for watering gardens, the amounts required by the cisterns and urinals he held to be in excess of the quantity allowed by the company's regulations, which were reasonable. As regards the boilers, the heating of the building was held to be a "domestic purpose," but not the driving of pumps or the machinery in the laundry, although the supply of hot water for laundry purposes would fall within that definition. The swimming bath was not in dispute, as it was decided in the Barnard case that if it was supplied for the business of the school it was not a "domestic purpose." On these cases the position of the owner of a swimming bath in his own private house remains uncertain, although the Court of Appeal in the Barnard case seem inclined to think that the water would be claimed as for a domestic purpose.

The Crystal Palace Jubilee.

THE fiftieth anniversary of the opening of the Crystal Palace is an event of considerable interest. There are only a minority among us now who can dimly remember the first erected glass palace in Hyde Park for the 1851 exhibition, and the then novel spectacle of the trees growing under the transept roof, with that exceedingly characteristic specimen of Early Victorian art, the "crystal fountain" in the centre, and Hiram Powers's "Greek Slave," which had a tabernacle to itself opposite the central entrance of the exhibition, and was then popularly supposed to represent the highest point of modern sculpture. The decree that the building should be utilised, after the exhibition, to form part of the larger erection at Sydenham, was a fortunate one. It has not only provided for middle-class London a very attractive holiday place; but the fine series of reproductions of ancient statues and ancient architecture have no little educational value; and in respect of its great series of Saturday afternoon concerts, and its triennial Handel Festivals (first started to commemorate the centenary of Handel's death), the Crystal Palace has been to many persons the scene of some of the highest enjoyment of their lives. On this account it was very suitable that an important part of the celebration should consist of a performance of Mendelssohn's "Hymn of Praise" with a chorus and band on the Handel Festival scale; nothing could be more suitable for a festival occasion than that bright and jubilant piece of sacred music, of which a very fine performance was given. A curiosity in the programme book was the reprint of the article written on the occasion of the opening of the Palace by Queen Victoria, with its elaborate directions to the carriage-owners and cab-drivers as to the best route to the then unknown site. The evening concluded with a display of fireworks; and these also have been an element of beauty, in connexion with the Palace, which is not to be despised, and in which old and young alike can find pleasure.

London County Council Schools.

THE annual exhibition of work executed in the London County Council Schools was opened on Monday at the Medical Examination Hall, Victoria Embankment. The year's work shows very little difference to that of last year. The work done in the infants' department is still the most interesting both in method and results; in the more advanced sections much still remains to be hoped for in the method of teaching and in the models set before the student. Thus, in Still Life the unfortunate pupils at one school are set down to make careful water-colour drawings of an American radiator, a modern kitchen range, and a turned wood chair of the present office furniture pattern. In the woodwork section the more elaborate and ornate the work done the worse it gets; after an apprenticeship at mortising, tenoning, and dovetailing, and the interpenetration of solids,—some of the most difficult operations in joinery,—the student is allowed to let his (we hope) unaided imagination run free in the production of corner cupboards, tea trays and picture frames of an ugliness devoid of either the grotesque or of any constructional interest. Frets, mouldings, and inlay are crowded into the same object. It seems a pity that the London County Council should not bring better influence to bear on the work of the pupils in its schools. These handicrafts are a source of genuine pleasure and education to the students, and proper guidance at the impressionable age would help to form good taste in design, and show its relation to sound workmanship. Very valuable is the work done in teaching the blind and deaf how to work with their hands, a great variety of whose work is shown. Perhaps the classes in modelling and design from nature show the most talent.

Cleveland-row and St. James's-street.

ALL the buildings—the gymnasium of the London Fencing Club at No. 7 excepted—in Cleveland-row, opposite St. James's Palace, together with Russell-court and the premises at the corner, in St. James's-street, have recently been pulled down; the site is appropriated for, we are informed, a block of residential flats. Cleveland-row commemorated by name the mansion, formerly called Berkshire House, which was bought by King Charles II. for Barbara, Duchess of Cleveland, and having been since subdivided and greatly altered, was rebuilt by Sir Charles Barry as Bridgewater House in 1847-50. Cleveland-row has had many celebrated residents, including Philip, Earl of Chesterfield; George Selwyn, who passed the close of his life there; and, at No. 5, Theodore Hook, who removed thither from Putney in 1825, and went thence in 1831 to Egmont Villa at Fulham. The house, latterly a post-office, at the corner of St. James's-street, and Palace Chambers, had been built on the site of the St. James's coffee house, a noted haunt of the Whigs and the "fountain-head" of the *Spectator*; it was pulled down in 1806.

Pall Mall East, and Cockspur-street.

THE demolition has been begun of the large house, having a recess with four disengaged columns on the principal floor, which forms the apex, towards the west, of the block of buildings situated between Pall Mall East and Cockspur-street. That block, which includes on the east side the Union Club-house and the Royal College of Physicians, was erected as part of the improvements carried out in the locality by Nash in pursuance of the Act of 1813 (53 Geo. III., cap. 121). The house we mention, consisting of No. 19, Pall Mall East and No. 1, Cockspur-street, was built after the designs of Henry Rhodes, who, during some years before his retirement in 1840, was joint architect and surveyor, with Thomas Chawner, to the Commissioners of Woods, Forests, Land Revenues, and Public Buildings. The premises were formerly occupied as their glass factory by Hancock and Rixon, and have since served as the Universal Stock Exchange. We understand that the new buildings will be erected for a large shipping trust, after plans and designs by Mr. Tanner.

Views on Egypt.

MR. TALBOT KELLY, who has made a special study of Egyptian landscape, has a fine exhibition of his recent water-colours in one of the rooms of the Fine Art Society. These are drawings which not only give the impression of being topographically accurate, but are works of artistic power. He succeeds in conveying in such drawings as "The Sun-blistered Desert" (1), "A Bedouin Hawking Party" (7), and "A Desert Upland" (55), a vivid impression of the effect of sun-glare on surfaces of nearly bare hot sand. The drawing called "A Wayside Sketch" (52) shows a kind of lane which could probably be found nowhere in the world but in Egypt—a ridge of sand with ragged vegetation on each side of it. In the scene on the Nile, "Down the stream drowsily" (25), the sand cliffs on the other side of the river are admirably painted. The view of the well-known Memnon figures (23) gives one a new idea of their effect as contrasted with the patches of very bright green vegetation around their base. Mr. Kelly paints architectural detail also with most conscientious care, as in his "Interior of the Mosque el Ghury" (29), which as an architectural drawing could not be better. "Philæ. Before the Completion of the Dam" (57) has a melancholy interest, and a curious bit of

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accidental architectural composition is shown in the small drawing of "Guergeh" (66).

Water-colours by Mr. H. S. Tuke.

MR. H. S. TUKE, most familiar to us as an oil-painter hitherto, and especially as the painter of nude figures in sunlight, has recently been elected a member of the Society of Painters in Water-Colours, and exhibits at Messrs. Dowdeswell's Gallery a collection of water-colours "Along the Italian Riviera," which are totally different from any of his previous work that we have been acquainted with. These are almost entirely landscapes or shipping sketches, slight in execution but in a true water-colour style, and show a full appreciation of the effects of colour to be found both in the landscape and in the shipping of the Riviera. The Genoese evidently delight in lavishing masses of bright colour on the exterior of their ships, and Mr. Tuke turns this taste to great account in his bright sketches of "Veterans" (10); "Green and Gold" (15); "Evening, Genoa" (28); and "'Luigi,' of Genoa" (46), showing the stern of a ship painted in white and bright blue. Landscape effects too are not wanting; "Roquebrune from the Mentone Road" (21); "Cervo, a Ligurian Rock Village" (23), a most curious bit of indigenous architecture; "Porto Fino" (34), with its sunlit white and yellow houses reflected in the calm sea; and others. The little sketch of "Pisa" (39) is an excellent though slight rendering of an architectural group. To find a painter whom we have long admired coming out so successfully in an entirely new class of work is an interesting artistic event.

Mr. Alexander Fisher's Work.

AT the Dowdeswell galleries also is a collection of important decorative work in gold, silver, bronze, and enamel, by Mr. Alexander Fisher. These include two cases of jewellery and two of decorative caskets and other work, besides larger objects which are arranged round the room. A great deal of the jewellery is charming in fancy; and among the silver caskets are some which show beautiful artistic quality in the combination of *repoussé* design or panels of richly-coloured enamel with the plain spaces of untouched silver. The quality of colour in some of these enamel subjects on silver is peculiarly fine. Among the objects round the room are a very fine chalice, with silver base and stem and an ivory bowl with a flat carved design worked on it; a salt-cellar in plaster silvered (a model only) showing a vigorous design of Neptune and his horses; and a very clever and effective bracket for electric light, representing "Selene, the Moon Goddess"; a circular bronze plate with high relief sculpture is nearly encircled by a transparent moon-shaped crescent of horn, through which or within which the light is to shine. There is a little too much tendency to the weak curves of the *Art Nouveau* persuasion occasionally, as in some of the jewellery and in the electric bracket numbered 73; and the two church candlesticks would be better if their stems were treated with some more decisive design in fluting, instead of being merely reeded in a kind of careless and accidental manner. But, with some eccentricities, this is a collection full of artistic interest and talent.

Society Touting by Architects.

THE following remarkable advertisement has been appearing in the daily papers:—

"WEST-END ARCHITECT desires the CO-OPERATION of influential Society man or woman who can privately INTRODUCE ARCHITECTURAL or DECORATIVE WORK. £1,000 a year can be added to income without any trouble and whilst attending to ordinary social engagements. Best class of work only desired. Bankers' and clients' references. Address in strict confidence 'Architect,'" etc., etc.

This is a very disagreeable sign of the times in every sense. It is known (or at least confidently asserted by those who ought to know) that ladies, even young ladies, who are more fashionable than rich, are not above adding to their means by acting as unacknowledged Society touts for dressmakers and others—recommending this or that firm in conversation with their friends, and so on. So far, the discredit attaches to the Society side of the matter; one cannot be surprised that tradespeople are willing to extend their business in that way, if they find ladies sufficiently devoid of self-respect to engage in it. But it is a new thing to find it proposed in connexion with what ought to be a liberal profession; and one can only regret that, as far as we know, the first open effort of this kind should have come from a member, though probably not a very illustrious one, of the architectural profession. One wonders whether this gentleman is one of the architects who wish to be registered.

THE INSTITUTE GOLD MEDAL, 1904.

M. AUGUSTE CHOISY, the distinguished French writer on architecture, to whom the royal gold medal has been awarded this year by the Institute, was a student in the École Polytechnique in Paris, and, passing out very high in the examination list of that school, he elected to enter the service of the Ponts et Chaussées, which holds a higher rank than that of the Engineers or Artillery. He had already at an early date employed his leisure time in archæological research, devoting his attention specially to the methods of construction employed in ancient times, a study for which his career in the École Polytechnique peculiarly fitted him; and some of his essays communicated to the French Academy received the warm approval of its members. One of the results of these studies was his appointment as "professeur-adjoint" in the History of Architecture of the École Polytechnique in collaboration with M. de Dartein, the senior professor.

The earliest mention recorded in print of his researches will be found in Viollet-le-Duc's "Dictionnaire Raisonné de l'Architecture Française," Vol. IX., published in 1868, under the article "Voûte." On page 477 is entered the following note, which we quote in full, as it shows the line of study which M. Choisy had selected for investigation:—

"Un jeune ingenieur français, M. Choisy, va publier prochainement un travail très complet sur la structure des voûtes Romaines, d'après les monuments. Le recueil que nous avons eu entre les mains, donne au détail les divers procédés employés par ces grands constructeurs, et demontre, de la manière la plus évidente, que l'économie dans la dépense était une de leurs principales préoccupations. Nous engageons les architectes, qui veulent sérieusement connaitre les procédés employés par les Romains dans les constructions à recourir aux travaux de M. Choisy sur cette matière."

We gather from this note that M. Choisy's researches became known to Viollet-le-Duc, who, when writing his article on vaulting, recognised that the principles underlying the construction of the Gothic vault had already been followed in Roman work, with this exception, that in the latter style the supporting ribs were concealed in the vaulted mass, whilst in the former style they were not only made prominent features, but in their development evolved a new style. Already, in the fourth volume of the dictionary, published in 1859, under the article "Construction," page 2, Viollet-le-Duc had shown that he was acquainted generally with some of the principles of the Roman vault, but M. Choisy's interpretation and the minute and detailed observations which he had made enabled him to carry the subject much further in 1868 than he had been able to do in 1859, although it went outside the sphere of his dictionary. It is quite certain that there was no one to whom M. Choisy's researches would appeal more strongly than to Viollet-le-Duc, with his powerful reasoning faculties. M. Choisy's work, "L'Art de Bâtir chez les Romains," was, however, not published till five years later, viz., in 1873, so that it would seem that his professional duties on the one hand, and his desire on the other to make his researches as complete as possible, prevented an earlier issue.

The economy in expense which Viollet-le-Duc in his note says was one of the Roman masons principal preoccupations referred mainly to that of the centring employed for these immense vaults, and this had only been recognised to a certain extent by Viollet-le-Duc in 1859, if we may judge by his statement, page 2, Vol. IV. M. Choisy's notes showed that the brick arches were not continuous, but, as shown on page 466, Vol. IX., in Viollet-le-Duc's drawing, Fig. 1, were erected over special centres only and held together at intervals by bands of brick on edge, the bricks in question measuring about 1 ft. 6 in. square and 2 in. thick. M. Choisy's second discovery, however, was even more important, for he showed that in the erection of these great vaults the first task undertaken was the construction of what was virtually only a shell consisting of two courses of Roman bricks laid in cement and breaking bond, which were laid direct on the boards carried by the centres. It was on the top of this shell that the brick arches and ties were built, the value of this shell becoming apparent in the next process, when the spaces between the ribs and ties were filled in with pozzolana concrete laid in horizontal beds. The shell, together with the centring, was sufficiently strong, on account of its arched form, to bear the superincumbent weight, and the trouble which might have been caused by the twisting of the boards if the wet concrete had been laid on them was disposed of by the employment of the shell. Viollet-le-Duc's drawing only shows one layer of bricks, but M. Choisy, in his work, "L'Art de Bâtir chez les Romains," proves that they were invariably in two thicknesses, with considerable variety in their method of breaking joint. M. Choisy's researches in this one constructional feature are of great interest and value, and so convincing in their proofs that they have been universally accepted. The economy of centring is also shown in the diagonal ribs of the Palatine Palace vaults and in those of the arch of Janus in the Forum Boarium and of the Thermæ of Diocletian. In each case one of the diagonal ribs was built first and the centring shifted to build the second, proved by its butting up against the first. These questions, however, constitute only a small portion of the information given respecting the construction of Roman buildings.

M. Choisy's next research would appear to have been in that of Byzantine construction, and in his work, "L'Art de Bâtir chez les Byzantins," published ten years later, he, applying the same principle of observation, worked out the schemes employed in the construction of the vaults throughout Greece, Asia Minor, Constantinople, and Syria, a subject which had never been treated before, and his book to this day is still the only authority. His studies in Greece led him to an inquiry into the interpretation of various inscriptions found there on marble slabs, for, just as the Egyptians wrote their records and accounts on papyri and the Assyrians on terra-cotta tablets, the Greeks inscribed theirs on marble. In 1882 a marble slab was discovered near Athens on which was written in *ninety-seven lines of text the complete specification for the building of the Arsenal at the Piræus.* In his "Études sur l'Architecture Grecque," published in 1883-4,

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M. Choisy translated this inscription and illustrated its reading by a conjectural restoration of this arsenal, which not only followed the clear description given, but constituted a lesson in the methods employed by the Greeks in the construction of their timber roofs; a lesson all the more valuable because, on account of their ephemeral character, no examples have come down to us. In the same work also he published an illustration of the construction of the roof of the long wall leading to Athens, also derived from an inscribed slab. Another inscription related to the work required for the completion of the Erectheion, which for various reasons had been delayed, and here he was able to restore conjecturally the marble roof of that temple and to describe portions of its architectural features which were comparatively unknown.

The lectures which for many years M. Choisy had been delivering at the École Polytechnique probably laid the foundation for his next work, "A History of Architecture," which was published in 1898-99. This work, though confined to two modest Imperial octavo volumes, contains the pick of what might easily be extended to a dozen or more, as it commences with Egyptian architecture, passes in review all subsequent styles, including Indian and Chinese, and terminates with the Renaissance to the end of the XVIIIth century. There is, unfortunately, no preface, which is the godsend for reviewers, and probably on that account it has been so far insufficiently reviewed here in England. The historical and chronological portions are very brief, M. Choisy's object would seem to have centred more, firstly, in the systems of construction employed by different nations and in all times; secondly, in the constructive and decorative forms found in each style; and, lastly, the principal monuments. The chapters describing the various styles follow chronologically and, consequently, also the gradual developments, but M. Choisy seems to have felt that if he once commenced the usual historical account his book would have extended to many more volumes. He has made up for this deficiency, if it is one, by the drawings which he specially prepared for the work; and these drawings have this exceptional interest, that they represent clearly in the finest possible lines all the principles of the forms or features he is describing. In the series of about thirty drawings illustrating Romanesque architecture in France he conveys more information than is found sometimes in a folio volume. The drawing of Nôtre Dame du Port Clermont, Fig. 30, page 230, Vol. II., is not only extremely beautiful in its lines, but the isometrical view given represents plan, section, and perspective all in one illustration. M. Choisy's last work, published this year, goes back to the earliest style. In "L'Art de Bâtir chez les Egyptiens" he returns again to some of the theories put forward in his "History," but he develops them farther, and, among other subjects, his description of the method employed in the building of the Pyramids and of the immense temples at Thebes, with the clear proofs he gives at every step, is one of the most brilliant results of his inquiring mind. M. Choisy follows most worthily, therefore, in the wake of one of his predecessors, M. Viollet-le-Duc, who, in 1864, forty years ago, received the Royal Gold Medal "for his works tending to promote or facilitate the knowledge of architecture or the various branches of science connected therewith."

THE COURT THEATRE, SLOANE-SQUARE, CHELSEA.—Some extensive structural alterations will shortly be carried out for Mr. J. H. Leigh, of the Court Theatre, with the purpose of adapting it for new uses as the amateurs' theatre. The interior is to be redecorated and so rearranged that the floor of the auditorium may be readily appropriated in its entirety for stall seats, and the pit seats removed, and the front will be raised by an additional story; Mr. C. E. Lancaster Parkinson is appointed as architect for the new works. The Court Theatre was built for Mr. John Clayton after designs by Mr. Walter Emden and Mr. W. R. Crewe, upon Lord Cadogan's estate, and opened on September 24, 1888, by Mrs. John Wood and Mr. Arthur Chudleigh. The former theatre that stood nearly opposite on the other side of the road was taken down in 1887 for some improvements in that part of Sloane-square on the Cadogan property. The house had been a chapel, converted (by Mr. Emden) into a theatre, and was opened by the late Miss Litton on January 25, 1871. The present house was planned to accommodate an audience of 860 persons.

THE ARCHITECTURAL ASSOCIATION SCHOOL OF DESIGN.

THE Exhibition of School of Design and prize drawings at Tufton-street shows much work of considerable talent, and is gratifying evidence of the work of the past year. The character of some of the work, both in drawing and design, shows painstaking and conscientious study, with a certain restraint and dignity which are to be commended. *L'Art Nouveau*, which was so seductive to the eye of the young student, has not prevailed, and its influence is only noticeable in a more or less inoffensive way, while the best traditions of architectural design are more truthfully maintained. There is yet much to be wished for in this direction, and the more students realise the value of Academic restraint in their early study, the more will our architecture benefit. The tricks of paper design too often blind them to the true appreciation of design in execution. The little prettinesses of the pencil and brush are so many traps for the innocent and well-meaning youth, and ought to be discouraged by all means possible.

The A.A. Travelling Studentship is won by Mr. George Drysdale, with a very creditable set of drawings. The pencil sketches of Gloucester Cathedral and St. Michael's Church, Gloucester, are good free drawings, and useful studies. The measured drawings of the Booth Porch, Hereford Cathedral, with full size details, have been carefully worked out. In design he shows considerable ability in planning, as seen in the plan of the Solicitor's House, but in the elevation misses his mark by attempting a combination of Elizabethan and Georgian details, and a meaningless use of stone band courses.

The Library for a County Town is planned on one story, and has the lending library badly placed, with very cramped indicator space, caused by the introduction of an octagonal domed reference room, the position of which is more suitable for the lending library. The elevation of the front is a charming bit of Renaissance. "An Inexpensive Church," in a corner site, is one of the subjects shown, and is not successfully planned. The main entrance is placed at the side, with the morning chapel in the south-west angle. A wide nave leads to a featureless chancel, with the choir stalls unhappily placed. Here again the elevation is spoiled by the use of stone bands.

The second prize is gained by Mr. Alick Horswell. His sketches of Muchelney Priory and Thaxtead Church are nice sketches, but much too slight. The measured drawings of The Orangery and North Porch of Thaxtead Church are weak. The design for an inexpensive Church is a most creditable effort. The plan is cleverly arranged, more for architectural effect than economy of space. The main entrance is in the east end, and the morning chapel and chancel are grouped together. The design is a charming piece of plain gothic work in stock brick and stone, with all the spirit of true church design, and well shown by a clever set of drawings. The Public Library is not so successful, although the same appreciation of harmony and proportion is shown. Altogether the work of this student gives much promise, and it seems unfortunate that he has only secured second place in the Advanced Class of Design.

The first prize in Advanced Design is won by Mr. Maurice E. Webb, who shows a good plan for the Library, utilising the space in a simple way, and providing for easy supervision. His design for a County Bank is also a businesslike plan, but is very weak in elevation. The design for a Police Station is a creditable piece of work, and is in all probability responsible for his position as winner of the prize.

The Architectural Union Prize is won by Mr. Cecil R. Pinsent, with measured drawings of the Hall of Eltham Palace, showing details of the roof, but we should have liked to see more explanation of the construction than is shown on the drawings.

The Association Medal is won by "Wee Macgregor," with a set of excellent drawings. The subject is a block of shops and flats. The ground floor plan is cut into simple sections for shops, with a main staircase to the flats in the centre. Only two flats are provided on each floor, which do not utilise the site to the greatest advantage, but which nevertheless show good planning. The elevations are a bold and scholarly treatment of Renaissance, and show conscientious study of the style. This design is well ahead of the others sent in. "Ad Hoc" gets into trouble with a very complicated ground plan, but triumphs commercially by providing four flats on each floor above. His want of knowledge of detail mars an otherwise well-conceived front elevation. "Cortez" cuts his shop floor into sections of various sizes, and gets a workable and commodious plan to his flats, but he must try and forget the class of design in which he is now wallowing. "Ibex" shows good drawings and divides his shop floor into shallow compartments, which is unwise from a commercial standpoint. The front elevation is unscholarly but has promise, and shows appreciation of mass and proportion.

The Banister Fletcher Prize is won by Mr. F. J. Watson Hart, with measured drawings of Customs House, King's Lynn, Eltham Palace Hall, and Gateway to Queen's College, Oxford.

In the Elementary Class of Design Mr. D. G. Round wins first place, and shows some promising work well drawn. His wooden porch is rather too elaborate in detail, and the stone porch is weak in proportion, and lacks the quality of the design. Both are altogether too ambitious. The block of three semi-detached cottages in stone and slate, shows careful thought and good feeling for simple domestic work. The second prize is won by Mr. Cyril K. Roe. His three cottages are charming, and the wooden porch is also quiet and refined. The stone porch is somewhat too elaborate, and his clock tower is very much behind his other work.

The elementary design generally is a most interesting exhibition, and there is much real talent in evidence, hidden behind the "up-to-date" influence which is so detrimental to the progress of Architectural Education.

EXCAVATIONS AT SILCHESTER, HANTS.

NOTWITHSTANDING the wet season of last year, good progress has been made in the further excavation of the interesting Roman town at Silchester. An exhibition is now being held at the rooms of the Society of Antiquaries, Burlington House, and will remain open until June 25. Architecturally, the results of the work of the past twelvemonth have been more than usually interesting, and, in addition to the foundations of several houses, the plan of an important building, thought to be the principal baths of the Roman town, has been exposed, and, for the benefit of those able to visit the site, will remain open until the autumn. The building, which measures "about 145 ft. from north to south, and nearly 100 ft. from east to west," includes (we quote from the Report) "all the usual parts of a Roman bathing establishment, which were arranged much on the same system as a modern Turkish bath." The approach from the street on the north side was through a courtyard or cloister, and this will be thoroughly examined during the present season. The building has evidently undergone considerable alterations from time to time, and a series of very interesting plans, showing as far as possible how these changes may have been made, has been prepared by Mr. W. H. St. John Hope, and forms one of the chief architectural points of interest in the exhibition.

The fragments of architectural work include a small altar, about 2 ft. in height, caps and bases of columns, and portions of a Purbeck marble basin, which, when perfect, appears to have been about 5 ft. in diameter. Portions of flues are shown with openings at the sides, and a number of T-shaped irons, which held them together; also a number of paving bricks, forming a herring-bone pattern, and measuring 6 in. in length, 3 in. in breadth, and 2 in. in thickness.

A large number of smaller objects were found, including a pair of gold earrings, a silver ring, a brooch, circular in form with delicate ornament, and a large quantity of bone hairpins; but the "pits" found during 1903 were not numerous, and the wet season prevented their being very thoroughly examined. Several plants have been identified from the seeds found in these pits and wells.

During the present season, with improved weather, it is hoped, among other things, to complete the excavation of the baths and their surroundings, and the results this year should, therefore, be specially interesting, and add considerably to the plan of the Roman town and its arrangement, which the work of fourteen successive seasons has been gradually completing.

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THE BRITISH ASSOCIATION OF WATERWORKS ENGINEERS.

THE annual meeting of the British Association of Waterworks Engineers was opened in the Town Hall, Hull, on Thursday, June 9. Mr. F. J. Bancroft, B.Sc., Assoc.M.Inst.C.E., of Hull, President, was in the chair, and there was a large gathering of members, including Messrs. R. H. Swindlehurst, Bolton, the retiring President; W. Watts, Sheffield; W. G. Pearce, Richmond; E. Devonshire, London; H. Ashton Hill, Birmingham; R. S. Lloyd, London; G. H. Klopp, London; H. Preston, Grantham; P. H. Palmer, Hastings; W. Middleton, London; Dr. Thresh, London; J. H. Crowther, Wallasey; S. Richardson, Birkenhead; C. Sainty, Windsor; T. Molyneux, Stockport, and others.

The Mayor (Alderman W. Jarman) heartily welcomed the Association to Hull, and hoped their visit would be of advantage and profit to the members.

Mr. R. H. Swindlehurst, the retiring President, was thanked for his services to the Association.

President's Address.

The President then delivered his Presidential address. Having thanked the members for electing him to that position, he said the membership of the Association was now 300, an increase of fourteen on the year. He estimated their members were responsible for the management of waterworks of a total capital cost of 54 millions sterling, serving a population of 14 millions, with a daily supply of 440 million gallons. Whether it was for purposes of investigation into a new or additional water supply, or for inquiry into the adequacy of an existing one, the question always presented itself to the water engineer—What was, or would be the consumption per head? If the district be a rural one likely rapidly to become urban, provision must be made for the change in the character of the district as well as the augmented increase in the population. He was no believer in the small consumptions occasionally brought to their notice from towns and districts where the supplies were restricted at the recurrence of every dry season, and where the consumers had a continual dread of being without a full supply. The measure of the adequacy of a public water supply was the ability to furnish the maximum hour's demand in the day of greatest consumption. Improved sanitation was being forced throughout the country, and in the majority of cases this entailed an additional use of water. Water-closets, baths, and hot-water apparatus were now fitted in cottages, increased quantities of water were demanded for street watering and the automatic flushing of sewers and public conveniences, and in towns many trades spring up which were entirely dependent on an ample water supply. If, therefore, the maximum demand was unprovided for, a restricted supply had to be furnished at every recurrence of warm, dry weather, this being the very time when an abundant use of water was most essential for the health and convenience of the consumers. Consequently it was of paramount importance to recognise that a water undertaking should be fully capable of supplying the maximum hour's draught in the maximum day's consumption.

The Royal Commission on the Metropolitan Water Supply (1892) in their report adopted 35 gallons as a safe basis of calculation for the future daily requirements per head of the population of greater London. The maximum day's consumption being about 20 per cent. in excess of the average, he was of opinion that in large towns a capacity to furnish a maximum supply of 50 gallons per head per day would probably be the standard in the near future, and in small towns and rural districts an average of about 30 gallons, with a maximum of 36 gallons per day should be sought.

Speaking of the liability of well water to pollution, he said the moisture in the atmosphere commenced to take up impurities directly it was condensed, and in falling as rain it carried down organic matter and acids from the air. The rain, on reaching the ground, not only washed the surface of the land, but in passing through porous strata, the acids absorbed from the atmosphere gave it the power of taking up mineral matter in solution; at the same time the organic matter acquired at the surface was broken up by the process of natural filtration undergone by the water, and this tended to organic purity. According to the evidence of Dr. M. A. Adams in the Maidstone inquiry, the subsoil in its effect upon the water passing through it might be classified as follows:—(1) Top layer, or danger zone, containing putrefying organisms; (2) intermediate layer, or risky zone, containing nitrifying organisms; and (3) safe zone. Water to which matter from the first zone had gained access, or which had only passed through the first zone—i.e., surface water, must be considered dangerous. The second zone would yield a less dangerous, but not a safe, supply and the deep-seated water was quite safe. It was common knowledge that the level of the underground water rises and falls, and when the soil overlying the water-bearing stratum was clay a prolonged drought might easily produce dangerous conditions by causing the clay to lose cohesion and to become deeply fissured, and through these fissures foul matter from the surface might be washed down into the water-bearing stratum without undergoing any process of natural purification.

A study of the reports on the typhoid epidemics at Maidstone, King's Lynn, Worthing, and Beverley, showed conclusively that relations between water supplies and the surface of gardens or fields manured with human excreta and the proximity of leaky sewers or accumulations of filth were extremely dangerous, so that while deep-seated supplies were in no danger of pollution at the general gathering ground, there was potential and imminent danger from contiguous collections of filth. He should like to ask what was the most pressing need of water undertakings, the urgency of which was felt by all concerned in the management of waterworks, whether owned by corporations or companies? It was that they should have a department of the Local Government Board solely devoted to water supply, so that this subject and the many interests it involves might receive the attention which their importance deserved, nay, demanded. Let them consider for a moment the most important aspects of this question. The total area of England and Wales was about 37 million acres, and the population about 32½ millions, or on an average less than one person per acre. One inch of rain per annum on one acre of land, if stored, would yield an average of 62 gallons per day, so that the collection of the equivalent of 1 in. of rainfall over the entire area of England and Wales would be sufficient to afford a water supply to about double the present population. There were in England and Wales alone about 2½ million acres of uninhabited moorland and mountain, forming admirable gathering grounds and having the highest rainfall of any part of the country. Evidently there was ample surface and underground water for all our present and reasonable future demands if only it were protected from pollution, properly stored, justly allocated, and waste prevented.

With reference to pollution, the present system of control over undertakings for public water supplies was unsatisfactory and entirely inadequate. Every public water supply should be subject to an annual Government inspection, so that at least imminent danger of pollution might be detected and steps taken to remove the evil before any mischief resulted. At present filth might be deposited on waterworks land, sewers might be laid near wells, and sewage actually be poured into an absorbent water-bearing stratum without hindrance. They knew in recent years the disastrous and fatal results that followed the pollution of the public supplies at Beverley, Worthing, Maidstone, and King's Lynn. In his opinion such outbreaks would be entirely prevented if public supplies were periodically inspected by an independent authority, and the very existence of such an examination would make the authorities responsible for the local supplies more careful and alert. The areas over which local authorities and companies had control are now settled by purely parochial considerations, and had no regard to superficial or underground sources of supply. Thus they had some authorities possessed of powers giving them the exclusive right to the water from a watershed yielding a supply largely in excess of their present or any probable future requirements. On the other hand, they had large rural areas without any proper water supply on the boundaries of cities where an abundant supply existed. Such areas are a menace to the health of the cities they surround. Owing to the multiplicity of authorities and the difficulty of obtaining combined action, many such areas which might be effectively supplied by a joint comprehensive scheme remained dependent for water upon shallow, polluted wells. It should be the duty of the paramount authority to compel, if need be, the formation of joint water boards to deal with groups of towns and villages which, owing to their position and surroundings, could only be effectively dealt with by a joint scheme.

Again, with regard to underground water, much of the present rivalry and uncertainty would be obviated if there was an authority entrusted with the general welfare of the water supply of the country, taking wide views, and having and exercising power in these matters. Still further, there was the want of uniformity in the powers of water authorities, both in regard to the sources and supply of water and the regulation of its use by consumers.

There had been no general legislation relating to water supply since 1847, all the subsequent Acts being in the nature of amendment and supplement, and the need for revision to meet present requirements was shown, if in no other way, by the fact that in all recent Acts certain standard clauses had been regularly accepted, and were incorporated in the "Model Bill" issued by the Private Bill Office of the House of Commons. Surely the time was now ripe for a consolidation of all these enactments into a new general water Act. Further, he would call attention to the necessity for greater uniformity in our by-laws and regulations for preventing waste and misuse of water, and the desirability of all undertakings being called upon to supply annual returns as to levels of water, storage capacity, quantity supplied, etc., similar to those which the owners of gas undertakings were required to give to the Board of Trade. These matters had already been brought before the President of the Local Government Board by a deputation from the County Council's Association, the Sanitary Institute, the Underground Water Preservation Association, and their own Association. The fact that bodies with such divergent interests had been brought together for the purposes of concerted action, alone showed the pressing need of new legislation dealing comprehensively with the water supply of the country.

Mr. W. Matthews, Southampton, moved a vote of thanks to the President, which was seconded by Mr. Ashton Hall, Birmingham, and carried.

Messrs. A. H. Meysey-Thompson and H. Lupton presented a paper on the working cost of waterworks pumping-engines. They said that the number of types of engines at present in use was bewildering, and every type had its advocates. Although variations in the local conditions justified some diversity of type, two main lines of difference could be taken as covering waterworks practice generally. The first was the question of size, and the second was the relative positions of the engine and of the water to be pumped.

Concrete, etc., for Reservoir Embankments.

Mr. W. Watts, Sheffield, read a paper on concrete and puddle for reservoir embankments. He said it was natural that engineers should wish to know the results of practical tests before replacing clay puddle in works in which failure would involve such serious consequences. Puddle had long been regarded as the only reliable material under pressure, and in earthen embankments it was still pre-eminent, but in deep trenches concrete was far better as an impervious refilling, affording many advantages over clay, especially in bad ground; it was also more economical from a structural point of view. Cement concrete cost three times more than puddle bulk for bulk, but in embankment work it enabled the trench to be made narrower, and thus effected a saving in time, timbering, and pumping. An earthen dam was equally as enduring as one made of concrete, and in some districts had many advantages.

Mr. Earle, Hull, recommended standardisation in the grinding of cement.

Mr. White, Hull, considered that Mr. Watts had made out a very good case as to the advantage of using concrete in connexion with reservoir dams.

Mr. C. Smith said he had a preference for puddle in trenches where puddle of a strong tenacious nature could be got. Puddle was more elastic and more easily inspected.

Mr. Middleton, London, remarked that Mr. Watts had made out a very good case for concrete on the basis that they were to use a very much larger quantity of puddle than of concrete in the trench. He, however, did not see why these enormous thicknesses of puddle should be put in reservoir trenches.

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Administration and Control of Water Supply.

Mr. R. E. Middleton, M.Inst.C.E., London, read a paper on the administration and control of the nation's water supply. He said the authorities which it was desired to constitute should have jurisdiction (for purposes of the conservation of the water supply, preservation of fisheries, the prevention of pollution, and the disposal of sewage) over each of the great drainage areas into which the country was naturally divided, the water-sheds forming natural lines of separation best adapted for sanitary purposes. The author was also of opinion that these authorities should be responsible to a central Government department created *ad hoc*, by whom they would be required to put into force the existing laws for the prevention of pollution, and to whom they should be invited to submit suggestions for the amendment of the said laws, should such appear to them to be necessary or desirable. The proposed new authorities should be held responsible for the efficient supply of water and the general sanitation of their areas. They should be empowered to subdivide their districts in such manner as might best promote the objects in view, and should be entitled to enforce on each subdivision the provision of all the requirements referred to, and, on the failure of the sub-district to comply with its obligation in this respect, should be empowered to carry out the necessary works themselves, either by means of a private Act of Parliament or such other method as might be deemed sufficient to prevent injustice to the defaulting bodies. The proposed authorities should also have such powers of rating as the Government might think fit to grant.

Another important duty might be very properly placed upon the new authorities—viz., the collection, verification, and tabulation of rainfall and other meteorological statistics, the gaugings of rivers and streams, the measurement of varying water-levels in wells, the provision of statistics of water supplied, capacity of reservoirs, etc., and level of water in same, and other data bearing upon questions of public health. In this connexion it might be necessary that powers should be given to compel private owners to give facilities for obtaining the requisite information, but in any case water authorities and companies should be put under obligation to measure the quantity of water they receive and supply, and to afford all information with regard to reservoirs and wells.

The information thus obtained should be submitted periodically to the central department, by whom it should be tabulated and published within a reasonable time. It would, further, be of great value if maps could be prepared showing the location and extent of the underground drainage areas as well as those above ground. In a similar manner, statistics having reference to the treatment, purification, and disposal of sewage should be collected and published.

The author therefore submitted that the creation of such bodies as he had proposed, with authority to provide for the purification of the water supply where necessary, to protect all sources of water supply from pollution, to conserve fisheries, to consider all schemes either of water supply or of sewerage within their areas, to require—subject, of course, to appeal to a central department—the subdivision or amalgamation of areas of supply, and to report to the central authority on all schemes submitted to the two Houses of Parliament, would materially facilitate conservancy of the nation's water supply and its economical application to the best advantage of the population concerned, and there would remain but few instances where any community would be unable to obtain a water supply from its own drainage area.

Mr. Jones, Leyton, said that even some of the authorities which had been on the grasping principle of acquiring large water areas to the detriment of the rural districts and their less powerful neighbours, were beginning to see the necessity for some reform.

Mr. Percy Griffith, Secretary, said the paper practically represented the views of the Association. He assured those members who were associated with water companies that in this work they were in no way attacking the companies, but were seeking to advance the interests of water companies as well as of undertakings by local authorities.

Mr. Phelp thought that the author of the paper hardly appreciated the *vis inertiæ* which underlies public authorities in small districts.

Dr. Thresh pointed out that so far action by the Local Government Board had been in the direction of the prevention of pollution, and they might think that this proposed board would take a similarly limited view of its functions. He moved that it be an instruction to the Council of the Association to consider the constitution of the proposed rivers boards and the powers to be delegated to them, with the object of bringing the views of the Association to the knowledge of the President of the Local Government Board.

Mr. Middleton seconded the proposition, which was carried.

Pure and Wholesome Water and Pollution.

Dr. John C. Thresh, M.D., D.Sc., F.I.C., Lecturer on Public Health, London Hospital Medical College, read a paper on the practical definition of "Pure and Wholesome Water" and "Pollution." He said recent developments of chemical, bacteriological, and practical research as regarded the character of water supplies had brought the subject into great prominence, and it must be admitted that in the interests alike of water authorities and consumers the importance of the subject could not be over-rated. The public demanded to be supplied with what was defined in various Acts of Parliament as "pure or wholesome water"—that is, water free from pollution—and water engineers were anxious to meet their requirements. The misfortune was that there were such diversities of opinion as to what constituted a pure and wholesome water, that neither engineers nor the public knew what to believe. For example, they had experts of the highest eminence affirming that the water supplied to London was pure and wholesome, pointing to the practical experience of the last thirty years as evidence thereof, whilst other experts of equal eminence affirmed that the water was so dangerously polluted that those who used it run the risk of contracting disease, and even suggested the possibility of London being decimated by typhoid fever or cholera. The former based their opinion mainly on the evidence of experience, the latter on the assumption that certain theories were true. The majority of chemists agreed that the water was wholesome, but most bacteriologists said that the organisms it contained indicated dangerous pollution. In many other instances there was conflict of opinion between chemists and bacteriologists. In the circumstances, it was no wonder that both the public and engineers were bewildered. The reason of this state of affairs, no doubt, was that the subject was studied by many of these experts from one point of view only. The bacteriologist knew that certain organisms are chiefly found in sewage, and, therefore, if he found them in water he at once condemned it. The chemist knew that the purest water contained the merest trace of organic matter and of ammonia, whereas both were abundant in sewage. If, therefore, he found a slight excess of these in a water he condemned it as polluted, whereas if there was no such excess he passed it as pure.

Take first the water supply to London, or, rather, that portion of it which was derived from the rivers Thames and Lea. These rivers were undoubtedly polluted, and the water, as taken by the water companies, must be described as "polluted"; but before being delivered to the consumers it was submitted to various processes of sedimentation and filtration which removed at least a very large proportion of the bacteria and some little organic matter. If the filtration, etc., had removed such a proportion of the bacteria, and organisms characteristic of sewage could no longer be found in it (using reasonable quantities of water for the purpose of test), and the organic matter had been reduced to the amount found in admittedly "pure" waters, then the author would not hesitate to classify this filtered water as "pure." There was no doubt that on occasions the water was actually delivered in this condition, but usually the bacteria present, though few in number, include some of intestinal origin and characteristic of sewage. So long as these were very few, the author would have no hesitation in characterising the water as "wholesome," though not strictly "pure." In arriving at this conclusion the author was influenced by the fact that for very many years some six million people had been using this water without the slightest proof being adduced of its having prejudicially affected their health. Such an important fact should surely override any statement based on theory, and justify them in placing the London water in the "wholesome" class. For another example, take the large number of moorland and upland surface waters. If the moorland surfaces were not populated, the water might be delivered to the consumer in an unfiltered condition, in which case it would certainly contain low forms of vegetable and animal life in suspension. He did not regard such waters as "pure," though they were undoubtedly "wholesome," and if filtered so that these organisms were removed and delivered in a uniformly bright and well-filtered condition, then such waters should be classed with the "pure" waters. On the other hand, water derived from a watershed on which there were farms and houses, or stored in reservoirs to which even small quantities of sewage gained access, must be in an unfiltered condition more or less polluted, but if properly filtered might be classed among the "wholesome," if not among the "pure," waters. Where the gathering ground was moorland covered with peat deposits, the water would contain vegetable matter in solution. Such waters, if the soluble matter taken up from the peat was not excessive, might be classed as "wholesome," though it could scarcely be described as "pure." The action of these peaty waters on lead was well known, and a water which might be wholesome in the reservoirs or in the mains might become impure and unwholesome in passing through a length of lead pipe to supply a house. Deep wells usually yield "pure" water, but not infrequently the water contained salts of magnesium, calcium, etc., in objectionable quantities, and sometimes sea-water gained access to it, thus rendering it impure and possibly unwholesome. If sewage gained access to it in appreciable quantities, the water, of course, becomes "polluted."

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A WESTERN Counties district meeting of the Association of Municipal and County Engineers was held at Newport (Mon.) on Saturday, June 11. The members foregathered in the Council Chamber at the Town Hall, where they were received and welcomed by the Mayor (Col. Clifford Phillips).

Mr. W. Weaver, C.E., of Kensington, President, occupied the chair, and among those present were Messrs. W. Harpur (Cardiff), A. D. Greatorex (West Bromwich), J. S. Pickering (Cheltenham, Hon.Sec.), J. Haigh (Abergavenny) R. H. Hayes (Newport), J. P. James (Tenby), J. Holden (Llandaff), W. J. Davies (Nantyglo), W. J. Jones (Rhondda), W. L. Marks (Rhymney), J. Parker (Hereford), S. J. L. Vincent (Newbury), and F. W. Jones (Frome).

Newport and its Municipal Works.

Mr. R. H. Hayes, Borough Engineer, read a paper on Newport and its municipal works. He said modern Newport had really been created since the seventies. It was a parliamentary and county borough, and possessed all the adjuncts of a well-governed town, such as municipal buildings, markets, baths, free libraries, museum, hospitals, electric lighting and tramways, and an excellent supply of water. Commercially, Newport was an important seaport. Its imports and exports during 1903 amounted to no less than 5,922,013 tons. As a coal-shipping port it ranked third in Great Britain, the coal shipments during 1903 being 3,869,490 tons. It had developed the reputation—enviable or otherwise, according to one's point of view—of being the dumping capital of the universe so far as steel is concerned, no less than 267,405 tons being imported during 1903. Its manufactures were extensive and varied, the more important being directly connected with the iron and steel and shipping industries. The main drainage system was carried out in 1857, many of the old sewers and drains previously existing being grafted into the new scheme. The Corporation were advised by the late Mr. (afterwards Sir John) Hawkshaw to disregard their existing conditions, and to carry all the sewers to one main outfall sewer, discharging into the river Usk at the southern end of the town. Owing to a spirit of what had proved to be very false economy, this advice was set aside, and a scheme involving five separate outfalls was constructed. This system had since been very largely extended, and additional outfalls constructed, there being at present fifteen outfalls, varying in size from 4 ft. 6 in. by 3 ft.,

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egg-shape, to 12-in. diameter pipes. No ill effects had been experienced from the discharge of crude sewage into the river at so many points, owing to the great rise and fall and velocity of the tide, and the enormous volume of the stream as compared with the sewage. Recent analyses indicate that the river water contained more oxygen than the water supplied from the town mains. The samples for analysis were taken 50 yds. away from the outfalls at low tide. The main outfall sewers had to act as tank sewers for periods varying according to the tides, the maximum being three and a half hours. Very little inconvenience had been experienced from this, though complaints of cellar-flooding in the low-lying portion of the town were occasionally made. A length of about one and three-quarter miles had been paved with wood—karri, jarrah, red gum, creosoted memel, and American red pine treated with joedolite having been used. Of the hard woods the author preferred jarrah. Red gum had given trouble on account of the abnormal shrinkage, though if the timber were well watered the trouble disappeared. If memel were obtainable in sufficient quantity, it would probably prove a formidable competitor of the hard woods, as it made a very durable and non-slippery pavement. Every town and district had its own special problem. The particular problem for Newport had long been how to cross the river. In 1896 the author suggested that a transporter bridge, an example of which had recently been erected at Belbao, was a better solution of the difficulty than a subway, as it provided for all kinds of traffic. A scheme so novel and strange necessarily met with severe and even hostile criticism. Ultimately the subway was dropped, but public opinion was not sufficiently advanced to decide for the transporter. Various proposals were afterwards considered, but in 1899, after inspecting the Rouen transporter, a practically unanimous decision was arrived at in favour of a transporter bridge. M. Arnodin and the author were appointed engineers, and the proposal received parliamentary sanction in 1900. Tenders for the work were obtained in the summer of 1902, and substantial progress had been made by the contractor, Mr. Alfred Thorne. It was hoped that the works would be completed and in operation in the fall of 1905. The bridge was being constructed on Arnodin and Palacio's patented system, the chief feature of which is the provision of arrangements permitting the renewal of the most important of the suspension parts in detail without stopping the working of the moving portion of the structure. The bridge was really a suspension bridge of considerable height and span, carrying on its undersides lines of rails. On these rails will run a truck, from which is hung a platform or car, suspended at the level of the river banks. The principal load to be considered was that due to the effect of high winds. The chief dimensions were as follows:—Span, centre to centre of towers, 645 ft.; space between faces of piers, 592 ft.; clear height to underside of stiffening girder from high water mark, ordinary spring tides, 177 ft.; height of tower from pier cap or level of approach road to saddle, 241 ft. 6 in.; distance between centres of anchorages, 1,545ft.; centre of tower to centre of anchorage, 450 ft. The towers are of open lattice steel work, the bottom parts of the legs being spaced at central intervals of 78 ft. 9 in. (faces parallel to the river) by 36 ft. (transverse faces). The towers were solidly anchored to the masonry piers by steel bolts and shackles connected to the rocker spindle on which they rest. Each tower would be fitted with a stairway carried to the level of the bridge platform. The estimated weight of steel in a tower was 275 tons. The suspension cables were sixteen in number, four inside and four outside each side of each stiffening girder. They were connected by steel shackles to the main spindles or pins on expansion saddles on the top of each tower, the anchoring cables being similarly connected. Diagonal cables were introduced over a portion of the span. The weight of cables and suspension parts was 293 tons. The stiffening girders were 16 ft. in depth, being spaced laterally at central distances of 26 ft. 3 in. The weight of the girders and wind bracing was 539 tons. On each side of the web of the bottom boom of each girder a line of rails would be laid; on these rails would run a truck 104 ft. in length, furnished with sixty wheels, fifteen inside and fifteen outside on each side, with horizontal wheels engaging laterally on the edges of the flange plates. From this truck the car or platform was suspended by thirty steel cables which were crossed so as to form a trussing in order to prevent swinging motion either laterally or longitudinally. The car was 33 ft. in length by 40 ft. in width, and resembled a section cut from a 40-ft. street. It was designed to carry a test load of 66 tons in addition to its own weight (51 tons), making a total of 117 tons in all. The motive would be electricity, the motors being controlled from the moving car. The time of crossing would be about one minute, though this could be reduced if necessary.

Newport Borough Asylum.

Mr. A. J. Wood, architect, read a paper on Newport Borough Asylum. He said this asylum, which was now in course of erection, is situated at Caerleon, on a good site commanding pleasant views of the surrounding country. The buildings would provide accommodation in the first instance for 368 patients, 184 of either sex, while the administrative offices were designed for 500, the number to be ultimately accommodated. The asylum was arranged with administrative offices placed centrally. There were three blocks for patients on either side, and the workshops, laundry, and boiler-house were at the rear. The patients' blocks were all two-story buildings. The one nearest the centre on either side was allotted to sick and infirm cases, and consisted of a ward for thirty patients on each floor. The next block was designed for thirty-five epileptics and thirty-five quiet chronics, the epileptics being accommodated in a ward on the ground floor, and the quiet chronics in a similar ward on the first floor. Beyond this was the recent and acute block, which comprised a ward for twenty-seven patients on either floor. The future extensions would consist of a block beyond the recent and acute on each side for working patients, that on the female side being contiguous to the laundry, and that on the male side adjacent to the workshops. The whole of the wards were entirely self-contained, and are planned with the special requirements for the respective classes of patients. The day-rooms had cheerful and uninterrupted outlooks, and they, together with the dormitories, were thoroughly lighted and ventilated. The sanitary arrangements were placed in spurs at the back of the wards, from which they were separated by cross-ventilated lobbies. Staircases of artificial stone were placed at the extreme end of each block, thus affording two means of exit from every portion of the wards. The wards were designed on the continuous principle, which not only admitted of economy in working, but was also the most convenient for supervision. The official was placed centrally to the south of the administrative offices. The great fall in the ground back to front would not admit of this block being placed to the north, the position recommended by the Commissioners in Lunacy. It was a two-story building, containing on the ground floor committee rooms, offices for the medical superintendent, assistant medical officer, and clerk, pathological room, receiving room, and photo studio. The upper floor is allotted to the assistant medical officers and the matron, their quarters being quite separate and reached by different staircases. The dining and recreation hall was placed to the south of the kitchen offices. It was conveniently arranged for service from the kitchen and for entertaining purposes, and had separate entrances for males and females. After referring to the kitchen store and laundry, Mr. Wood said that on the male side, in close proximity to the new block for working patients, were the workshops. They comprised shops for shoemakers, tailors, upholsterers, carpenters, plumbers, painters, and glaziers, bricklayers' shed, foreman's office, etc. The blocks for attendants and nurses were placed in the usual position east and west of the administrative offices. They include the necessary mess and recreation rooms on the ground floor, the upper floor being allotted to night nurses and domestics on the female side, and to night attendants on the male side. In addition to a bath in each ward, a general bath-house was provided on either side, with the necessary dressing-room, etc., attached. Besides being provided with open fire-places, the buildings were warmed throughout on the low-pressure hot-water system. Fresh air is admitted at the floor-level at the backs of radiators, coils, and systems of pipes. The vitiated air was extracted at the ceiling and conveyed by flues formed in walls and chimney breasts to trunks in the roofs, which lead to main upcast shafts in which electric fans were provided to ensure an upward current. The buildings were to be lighted throughout by electricity. The water was from the Corporation supply, storage cisterns being provided in each section of the buildings, sufficient for a day's requirements. The Committee had purchased houses already existing on the estate for the medical superintendent and steward. The accepted tenders for the work amount in the aggregate to 102,098*l.*, made up as follows:—Buildings, 96,165*l.*; electric plant, 3,433*l.*; electric wiring and fittings, 2,500*l.*

The members had luncheon together at the King's Arms Hotel, and the afternoon was devoted to visits to the transporter bridge works on the river Usk, described in Mr. Hayes's paper. The interest of the meeting principally centred in the transporter bridge works, the only other bridge of this type in the United Kingdom being that to connect Widnes and Runcorn, and which was inspected at the meeting held in those towns in July of last year.

THE ASSOCIATION OF MANAGERS OF SEWAGE DISPOSAL WORKS.

A MEETING of the Association of Managers of Sewage Disposal Works was held in Bradford on Saturday last, having been organised by the Council of the Yorkshire District. The object of the visit to Bradford was to inspect the North Bierley and Frizinghall sewage works. The President of the Association, Mr. Scott Moncrieff, of London, and the Chairman of the Council, Mr. J. T. Hall, of Staines, were among those present.

Meeting at the Town Hall, the members of the Association were received by the Mayor (Alderman David Wade). Afterwards, with Mr. E. J. Smith (Chairman of the Bradford Sewage Committee), and Mr. J. Garfield (Sewage Works Engineer), as cicerones, the party made a tour of inspection around the North Bierley and Frizinghall works. Before entering upon their examination of the latter works they were given a *résumé* of the position of Bradford in the matter of sewage disposal, by Mr. E. J. Smith. There were, said Mr. Smith, eleven different sewage works in Bradford, but those at Frizinghall were the largest. At North Bierley the sewage was treated on the septic tank and filtration system; at the remaining works by chemical precipitation and artificial and land filtration. The Frizinghall works drained about 11,000 acres. Having given a brief description of the processes through which the sewage went, the speaker said that one of the great difficulties which had had to be met was the matter of the sludge, but that was now assuming a more amenable aspect, the processes employed making possible the extraction of from twenty to twenty-five per cent. of the grease along with the water. The grease was sold. Concluding, the speaker referred to the acquisition by the Corporation of land at Esholt for sewage disposal purposes, and said the effluent would be conveyed thither in a sewer about 10 ft. in diameter and from two and three-quarter to three miles long, estimated to cost 150,000*l.*

The tour round the works proved of great interest to the party, to many of whom the grease-extracting processes were new. On the completion of their inspection of the works, the Association were entertained to tea at the offices. At a subsequent meeting, presided over by Mr. Scott Moncrieff, Mr. J. Garfield read a paper on "The Extraction of Grease from Sewage." Having described the methods at present in use, Mr. Garfield explained that at the Frizinghall works plant was being laid down for the extraction of grease by distillation. With an experimental plant it had been found that practically all the grease could be extracted, the cake being left in a dry powder, retaining all the nitrogen which it originally had.

The members of the Association in the evening paid a visit to the Exhibition.—*Yorkshire Observer.*

MEMORIAL FOUNTAIN, FELLING, NORTHUMBERLAND.—A fountain, which has been erected in Victoria-square, Felling, in commemoration of the local men who took part in the South African war, was opened on the 4th inst. The memorial has been erected, at a cost of 140*l.*, by Mr. J. Wilkinson, contractor, Felling, from the designs of Mr. H. Miller, architect, also of Felling.

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THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

II.—COLCHESTER.

THE selection of the ancient Roman city of Colchester as the scene of the second Summer Visit on the 11th inst. was in every way an unqualified success. In the five hours devoted to study a large number of architectural and archæological objects of great interest reflecting the life and history of the town were inspected, ranging in time from the recently-built Town Hall back to the fortifications and other remains of the Roman occupation. The party was fortunate in having various gentlemen specially versed in the respective subjects to direct attention to the salient points of each.

At the Town Hall, the architect, Mr. John Belcher, A.R.A., discoursed upon his work and the difficulties of the problem to be overcome. We have at various times illustrated the design,* and on January 4, 1902, gave an account of the materials, the planning, and other matters, so that it is only now proposed to refer briefly to some general points of interest. A great effort had to be made to house the large accommodation on the small site and the problem was complicated by a variety of street levels and by scheming certain parts in connexion with an adjoining building. In essentials, the architect has succeeded although some sacrifice has been made in corridor and staircase space and a departure from custom is seen in the placing of the large hall on the top floor. The entrances and passages are well contrived and cleverly adapted to their respective levels. The Moot Hall is a well proportioned chamber and found to be completely successful in its acoustic properties. The general use of white in the mural colouring was perhaps felt to be overpowering; this is particularly the case in the Council Chamber, in which the absence of toned colours not only detracts from the value of the painted ceiling but confuses the sense of scale of the room. General approval was spontaneous as to the interior effects of the law courts, where simple, and withal dignified, treatments of oak panelling and seating are introduced. From an artistic as well as an utilitarian point of view the inspection of this municipal building was a valuable source of instruction.

Examples of XIXth century work were seen in the Albert School of Art, the Essex and Suffolk Fire Office, with its colonnaded loggia spanning the street pavement, and the Church of St. Nicholas, a rebuilding work by Sir Gilbert Scott. The large Water Tower at the west end of the town, comprising a huge iron storage tank carried upon brick piers and arches, is a good example of modern engineering.

Colchester and its district are singularly deficient in stone and other natural building materials, therefore the extensive use of brick and plaster is consequently found. Of Georgian and Anne architecture examples are so numerous that the greater part of the town would seem to have been rebuilt, and this activity was probably the outcome of the flourishing cloth-making industry which had been introduced by Flemish refugees. Under the able guidance of Mr. Horace Round, "Holly Trees" and "East Hill House" were visited, both of which have splendid gardens, whilst the houses themselves are placed close upon the main street—a typical arrangement of this period. Dwellings with plastered fronts overhanging upper stories and semi-circular oriel windows are both plentiful and of good detail. Of medieval work much is to be seen, and in all cases a general use of brickwork has been made with material closely resembling the thin Roman bricks, and it is not too much to suppose that much of this ancient material was largely re-used. The construction consisted of brick quoins and arches filled in with a rubble of small stones of marine or estuarine formation. The Church of St. Giles suggests later erection than other specimens, such as the tower of St. Martin's. St. Botolph's Priory is a particularly interesting Norman ruin dating from about 1100, having large circular piers and arches to the nave whilst the west front has a series of interlacing brick arches. The west door is probably a little later in date, and has stone caps and shafts, alternate carved stone and plain brick rings in the arch, indicating a careful and sparing use of the imported material, and the whole bears a striking influence of Roman work. The tower of Holy Trinity Church is an unique specimen of Saxon work divided by brick string courses into three stories and the use of quoins and filling is identical with later building. The ground story has a straight pointed or gable-headed doorway with brick label and imposts; various narrow single lights are placed on the four fronts but the topmost story has double lights, each with a brick mullion. The roof and wooden cornice are doubtless XVIIIth century work.

Colchester Castle, said to be the largest keep in England, was the subject of keen attention, and an attractive account of its plan was given by Mr. Round. In arrangement it resembles the keep of the Tower of London, although in size it is twice as large. The surrounding earthwork, the original entrance, the vaults, and the large stone newelled staircase were pointed out amongst a wealth of other archæological information. Part of the castle is used as a library and museum and the latter has in certain respects the finest collection of Romano-British remains in the kingdom.

Finally the Roman walls and bastions were inspected, in which the coursed rubble and brick bands are everywhere noticeable.

* September 4, 1897, May 17, 1902, and December 13, 1902.

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the Whitsuntide recess was held on Tuesday in the County Hall, Spring-Gardens, Mr. J. W. Benn, Chairman, presiding.

Marylebone Electric Lighting.—The Finance Committee recommended that the Parliamentary Committee should take the necessary steps for the amendment of the Council's Money Bill of 1904, so as to enable the Council to borrow and to lend to the Marylebone Borough Council in the event of that Council being empowered in this session to borrow for the purchase of a portion of the undertaking of the Metropolitan Electric Supply Company, Limited, the sum of 1,415,000*l.*, in substitution for the sum of 1,365,000*l.*, at present inserted in the Money Bill. This was agreed to.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 3,866*l.* for preliminary expenses in connexion with a housing scheme, 3,195*l.* for artesian wells at the baths, and 4,500*l.* towards the cost of street improvements; Fulham Guardians 14,000*l.* for poor-law purposes; Hammersmith Borough Council 10,634*l.* for electric light installation and meters; Poplar Borough Council 6,180*l.* for paving works; and Poplar Guardians 9,610*l.* for poor-law purposes.

Conditions of Labour in School Building Work.—Sir W. Collins, in answer to a question, said that the Council's conditions of labour, etc., would be incorporated in all future contracts for school building work.

Goldsmiths' Institute, New-cross.—The Education Committee, in reporting on the future of the Goldsmiths' Institute, New-cross, expressed the opinion that the retention of the Institute as a centre for evening instruction in the higher grades was highly important, and they were giving further consideration to the question of the utilisation of the Institute as a day training college. Upon this matter they proposed to report fully at a later date.

Mr. Evan Spicer said there was considerable local consternation at the prospect of the closing down of the useful work, both educational and social, which had been carried on at the Goldsmiths' Institute. In his opinion the proper body for carrying on the work there was the Council, to whom it ought to have been offered instead of to the University of London.

Sir William Collins associated himself with the remarks of Mr. Spicer, and stated that the Committee would be in a position to report thereon at a later date.

New Schools, etc.—The erection of a temporary school in North Camberwell to accommodate 300 children was sanctioned.

The Committee reported that, in order that they might be in the position to report upon the structural fitness and educational efficiency of the non-provided schools, they had arranged for a general survey by the inspectors, which was now being made.

It was agreed that, wherever sufficient bathing accommodation could be found for the admission of scholars of non-provided schools to baths the owners of which accepted the swimming vouchers of the late School Board, arrangements should be made for the extension of the swimming scheme so as to include the pupils of non-provided schools.

It was decided to proceed with the erection of new schools in Gordonbrock-street, Lewisham (W. Downs, contractor, 22,863*l.*), New-end, Hampstead (Messrs. E. Lawrance and Sons, 19,708*l.*), and Magdalen-street, Rotherithe (Messrs. Spencer, Santo and Co., Ltd., 7,947*l.*), and with enlargements and improvements in the schools at Sydenham-hill-road, Lewisham (Messrs. J. and C. Bowyer, 10,357*l.*), William-street, Fulham (Mr. F. G. Minter, 4,437*l.*), and Sleaford-street, Clapham (Messrs. Stimpson and Co., 9,210*l.*).

Teacher of Cabinet-making and Cabinet Design.—The following recommendation was agreed to: "That Mr. Percy A. Wells be appointed in charge of the cabinet-making work at the L.C.C. Shoreditch Technical Institute, subject to the usual conditions attaching to the Council's service; that he be required to devote the whole of his time to the day and evening classes of the Institute with the exception of one evening a week to the L.C.C. Central School of Arts and Crafts, and such time as may be required for the London Day Training College."

Architectural Education.—The Education Committee reported that they had received a letter from the Royal Institute of British Architects, stating that they have, after consultation with education authorities, established a board of architectural education to co-ordinate the existing schemes of architectural education throughout the United Kingdom, and to approach the various institutions where architectural instruction is given, with a view to the adoption of a uniform system of training which it is hoped to organise; adding that they desire to add representatives from the universities and other educational bodies to the board as advisory members, and asking whether the Council will appoint a representative. The Committee recommended, and it was agreed (*a*) That a representative of the Council be appointed to serve on the architectural education board of the Royal Institute of British Architects. (*b*) That Mr. Lewen Sharp be appointed as the representative of the Council.

Heath Asylum, Bexley—Erection of Cowsheds.—The Asylum Committee reported that they had had plans prepared for buildings providing the necessary accommodation for forty cows. The buildings will be constructed of Fletton brick with pantile roof. The estimated cost, inclusive of the necessary roads, is 2,780*l.* They recommended accordingly, and the recommendation was agreed to.

Glass Shelters.—The Building Act Committee recommended that permission be given to Messrs. J. Lyons and Co. to erect an iron and glass shelter to the entrance of their new restaurant in Piccadilly.

Mr. Jephson moved that the matter be referred back, on the ground that if permission were given in this case it would have to be given to every applicant, with the result that the pavements would be covered with shelters.

Sir Wm. Richmond said it appeared to him that these shelters were extremely undesirable from every point of view, excepting inasmuch as they might protect a few people from the rain. He did not say that iron and glass might not be made beautiful, but in this country we were not adepts at it. He had inspected some of the existing shelters, and he confessed that more hideous monstrosities he had never seen in any country in Europe.

Capt. Hemphill, the Chairman of the Committee, agreed to take the matter back.

London Building Acts Amendment.—The Building Act Committee reported as follows, the recommendation being agreed to:—

"The Council, on November 4, 1902, resolved to introduce into Parliament a bill to amend the provisions of the London Building Act, 1894, relating to safety from fire. Subsequently, on March 3, 1903, the Council decided not to proceed with the bill, but to refer it to the Building Act, Fire Brigade, and Parliamentary Committees with a view to their advising the Council, after consultation with such persons and authorities as might be desirable, as to the ultimate form the bill should assume. The bill referred to dealt only with the question of safety from fire and left unfouched many other important questions with respect to which the London Building Acts had been found to need amendment, and as the Council had decided that this bill should not be proceeded with in the session of 1903, we felt strongly that any amended bill should aim at securing all the important amendments required in the London Building Acts. It was not however found practicable for three Committees to prepare the material for a bill of this character, and the Council on May 26, 1903, on the recommendation of the committees concerned, rescinded the resolution referring it to those committees, on the understanding that the Building Act Committee would proceed with the preparation of proposals for securing all the amendments required in the London Building Acts, conferring with such authorities and persons as might be desirable. We have accordingly devoted much time and attention to this task, in connexion with which we have considered

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uggestions made by the Fire Brigade, Local Government, Main Drainage, Public Control, and Public Health Committees of the Council, by the majority of the Metropolitan Borough Councils, and by such bodies as the Royal Institute of British Architects, the Surveyors' Institution, the Institute of Builders, the District Surveyors' Association, and many other bodies. The work is one of considerable magnitude and difficulty, and the time at our disposal has not been sufficient to enable us to definitely settle all our proposals for the amendment of the Act. It is, however, very important that, if possible, the bill should be drafted in a sufficiently approved form for circulation to the bodies concerned before the Council rises for the summer recess, and to enable this to be done we purpose sending on at once to the Parliamentary Committee most of our proposals with an intimation that the remainder will be communicated to them very shortly. It is impracticable at this stage to give full details, but we purpose doing so as soon as possible. We may state, however, that our proposals have for their object, *inter alia*, the protection of life from danger by fire, the conferring of greater powers on the Council with respect to (*a*) the formation of new streets, (*b*) the provision of open spaces about buildings, especially buildings not abutting upon a street, (*c*) the re-erection of buildings within the prescribed distance from the centre of the roadway of a street to a greater height than the old buildings existing on the site, (*d*) the erection of dwelling-houses on land liable to flooding, and the remedying of certain other defects in the Act which ten years' experience of its administration has revealed. We also purpose seeking powers to enable the Council to determine the future building line in any street, so as to facilitate the gradual widening of congested thoroughfares, and we are considering the desirability of enabling the Council to make new streets where necessary, to continue such widened thoroughfares, or to afford through communication. We may state in compliance with standing order No. 365, that we are advised by the solicitor that the Council has power to promote legislation for the purpose in question. We recommend that it be referred to the Parliamentary Committee to prepare a bill for introduction into Parliament in the session of 1905, to amend the provisions of the London Building Acts."

Motor Car Registration.—The Highways Committee reported that the clerk of the Council had from April 20 to June 4, 1904, registered 506 motor cars and 365 motor cycles, thus making the total number of cars and cycles registered up to the last-named date 3,420 and 2,428 respectively. He had also issued during the same period 1,338 licences to drive motor cars or cycles, and general identification marks for motor cars had been assigned to seventeen manufacturers or dealers, the total number of licences and general identification marks issued being 8,533 and 264 respectively.

Improvements Suspended.—The Improvements Committee reported that they had given careful consideration to several suggestions which had been made to them for county improvements involving special statutory powers. These proposals included numerous important and desirable improvements, but after a full and careful review of all the facts, and having regard to the extent of the Council's present financial commitments, they thought it right to refrain from advising the Council to seek powers in the next session of Parliament in connexion with any of the schemes. In view of the large amount of work which the Council had in hand at the present time, in connexion with the reconstruction of existing and the construction of new tramways, the Highways Committee had also decided not to submit any fresh proposals for next session.

This was agreed to without comment.

The Council adjourned at seven o'clock.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Greenwich.—The erection of a pent over the entrance to a cottage at the Brook Hospital, on the south side of Shooter's-hill-road, Greenwich (Mr. W. T. Hatch for the Metropolitan Asylums Board).—Consent.

Hackney, North.—Three houses with bay windows and a porch upon the south side of Upper Clapton-road, adjoining No. 135, Clapton-common (Mr. C. Cheston for Mr. W. Osment).—Consent.

Hampstead.—A porch to the entrance to "Woodburne," Hollycroft-avenue, Hampstead (Mr. J. Darch for Mr. H. V. Bate).—Consent.

Hampstead.—A one-story shop on the north-east side of High-road, Kilburn, southward of Brondesbury station (Mr. A. Whitelaw for the London and North Western Railway Company).—Consent.

Hampstead.—A timber-framed porch to No. 13, Eton-avenue, Hampstead (Mr. A. F. Faulkner for Mr. Willett).—Consent.

Hampstead.—A deviation from the plans approved for the erection of porches, bay window, verandah, and projecting truss bracket to No. 58, Kidderpore-avenue, Hampstead, so far as relates to an alteration in the position of the house (Mr. T. C. Ovenston for Mr. C. Topham).—Consent.

Kennington.—Bay windows and a porch to No. 52, Priory-road, South Lambeth (Mr. F. Hingston for the Rev. Canon A. Edwards).—Consent.

Lewisham.—The retention of a wood and glass porch at No. 31, Clarendon-road, Lewisham (Mr. E. Leitch for Mrs. Sweny).—Consent.

Lewisham.—Pents to four houses on the southern side of Sydenham-park-road, Lewisham (Mr. H. G. Leslie).—Consent.

Lewisham.—Dwelling-houses with one-story shops in front, on the west side of Brockley-road, northward and southward of Eddystone-road (Messrs. Tompkins).—Consent.

Lewisham.—Concrete balconies in front of four houses in course of erection on the west side of Newlands-park, Lewisham (Mr. H. E. Davey for Mr. W. Cooper).—Consent.

Marylebone, East.—A bay window in front of No. 53, Queen Anne's-street, Cavendish-square, St. Marylebone (Messrs. Young and Hall for Mr. W. Turner).—Consent.

Paddington, South.—A deviation from the plans approved for the erection of porches on the ground floor, and oriel windows and balconies on the first and second floors of Nos. 18 to 23, inclusive, Hyde-park-place, Paddington, so far as relates to an alteration to the oriel windows on the first floor of No. 18, Hyde-park-place (Mr. A. Mitchell Torrance for Mr. H. B. Gross).—Consent.

Peckham.—Three one-story shops upon part of the forecourt of No. 18, Rye-lane, Peckham (Messrs. Done, Hunter, and Co. for Messrs. G. and H. Neal).—Consent.

St. George, Hanover-square.—That permission be given to Mr. G. Odone to retain a projecting iron and glass shelter at the entrance to No. 152, Victoria-street, Westminster, extending beyond the general line of buildings in the street).—Agreed.

Strand.—A sign in front of "Craven House," Northumberland-avenue, Strand (Messrs. Yates, Haywood, and Co. for Messrs. Simon Brothers).—Consent.

Wandsworth.—Pents and half-timber gables to twelve semi-detached houses on the east side of Enmore-street, Putney, southward of Howard's-lane (Mr. J. C. Radford for Mr. E. R. Parry).—Consent.

Wandsworth.—Pent in front of a cottage at the Grove Hospital on the north side of Blackshaw-road, Tooting (Mr. W. T. Hatch for the Metropolitan Asylums Board).—Consent.

Wandsworth.—Porches to eighteen houses on the east side of Campion-street, Putney, southward of Howard's-lane (Mr. J. C. Radford for Mr. A. E. Pierce).—Consent.

Wandsworth.—Houses with shops on the south side of Mitcham-road, Tooting, between "Woodside" and "Melbourne-cottage" (Mr. W. Bartholomew).—Consent.

Wandsworth.—Houses upon the site of "Ravenswood," Streatham-common (south side), Wandsworth (Mr. R. I. H. Pippette for Mr. E. J. James).—Consent.

Woolwich.—That the application of Mr. R. Stewart for an extension of the periods within which the erection of eighteen houses on the north side of Bexley-road, Eltham, eastward of Elderslie-road, was required to be commenced and completed, be granted.—Agreed.

Width of Way and Lines of Frontages.

Kensington, South.—A one-story shop upon the forecourt of No. 1, Reece-mews, South Kensington, to abut upon Harrington-road (Mr. J. A. J. Keynes).—Consent.

Clapham.—That the application of Mr. R. S. Gray, for an extension of the period within which the erection of eleven houses with bay windows on the east side of Loats-road, and seven houses with bay windows on the west side of Lyham-road, Clapham, was required to be completed, be granted.—Agreed.

St. George, Hanover-square.—Two iron and glass shelters at the St. George's Union Workhouse, to abut upon Wallis-yard, Buckingham-palace-road, St. George, Hanover-square (Mr. T. Worlock for the Guardians of the St. George's Union).—Consent.

Formation of Streets.

Wandsworth.—That an order be issued to Messrs. W. W. Jenkinson and Co., sanctioning the formation or laying out of new streets for carriage traffic upon the Streatham-park estate, to lead out of Ullathorne-road, Thrale-road, and Aldrington-road, Streatham.—Consent.

Space at Rear.

Chelsea.—The "Swan" public-house, Sloane-street, Chelsea, with an open space at the rear (Mr. A. H. Mackmurdo).—Consent.

St. Pancras, West.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of an addition at the rear of No. 115, High-street, Camden Town, St. Pancras, to abut upon Delancy-street (Mr. G. H. Luetchford for Mr. E. Parrish).—Consent.

Whitechapel.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a block of working-class dwellings on the site of Nos. 32, 34, and part of No. 36, Pelham-street, Spitalfields, with an irregular open space at the rear (Mr. J. R. Moore-Smith for Mr. J. Donn).—Consent.

Buildings for the Supply of Electricity.

Bermondsey.—Works in connexion with the erection of coal bunkers, boilers, and conveyors at the generating station on the west side of The Neckinger, Spa-road, Bermondsey (Messrs. Kincaid Waller, Manville, and Dawson for the Council of the Metropolitan Borough of Bermondsey).—Consent.

Means of Escape in Case of Fire.

Strand.—(*a*) That the resolutions approving, under section 63 of the Act, of the means of escape in case of fire proposed to be provided on the fifth story of No. 7, Golden-square, and consenting, under section 73 of the Act, to the erection of a projecting balcony in front of Nos. 6 and 7, Golden-square (Mr. L. V. Hunt for Messrs. J. B. Ellison and Sons, Ltd.) be rescinded. (*b*) That Mr. L. V. Hunt be informed that the Council has considered the block, ground, and roof plans, front elevation, and section A.B., and fifth floor plan and section A.B., submitted by him, showing the means of escape in case of fire proposed to be provided, in pursuance of section 63 of the Act, on the fifth story of No. 7, Golden-square, Strand, for the persons dwelling or employed therein, and that the Council will issue a certificate.—Consent.

Lines of Frontage and Projections.

Fulham.—Buildings on the east side of Townmead-road, Fulham (Messrs. Macfarlane, Lang, and Co.).—Consent.

Westminster.—Four projecting oriel windows and balconies to a building on the north side of Wood-street, Westminster (Mr. W. D. Caröe for the Ecclesiastical Commissioners).—Consent.

Clapham.—Eight houses on the south side of Broomwood-road, Clapham-common, between Wroughton-road and Hillier-road (Mr. J. Smith).—Consent.

Hampstead.—An addition at the rear of No. 15, Steeles-road, Hampstead, to abut upon Eton-villas (Messrs. Bowden Brothers for Miss Hossack).—Consent.

Westminster.—That the application of Mr. W. Flockhart for an extension of the periods within which the erection of a projecting doorway at a new entrance to a building on the north side of Great Peter-street, Westminster, eastward of St. Anns-street, was required to be commenced and completed, be granted.—Consent.

Hampstead.—Porches in front of Nos. 32, 34, 36, and 38, Hollycroft-avenue, Hampstead (Mr. W. J. King).—Consent.

Lewisham.—A one-story addition to No. 107, Ringstead-road, Catford, to abut also upon Laleham-road (Messrs. Castle and Co. for Mrs. Fookes).—Consent.

Mile End.—A one-story shop upon part of the forecourt of No. 67, Globe-road, Mile End (Mr. J. A. Thompson for Mr. W. H. Wayland).—Consent.

St. George, Hanover-square.—An iron sign to a temporary wood and iron building on the south side of Piccadilly, eastwood of the Green Park, St. George, Hanover-square (Messrs. Waring and Gillow, Ltd.).—Consent.

Strand.—A projecting sign at Nos. 1 to 5, Poland-street, St. James, Westminster (Messrs. Bartlett and Ross for the Lacre Motor Car Company, Ltd.).—Consent.

Wandsworth.—Porches to thirteen houses on the west side of Campion-street, Putney, southwards of Howard's-lane (Mr. J. C. Radford for Messrs. Sampson Brothers).—Consent.

St. George-in-the-East.—A building on the south side of Wellclose-square, St. George-in-the-East (Messrs. Nash and Detmar for The Tower Tea Company, Ltd.).—Consent.

Hampstead.—A bay window in front of No. 26, Ellerdale-road, Hampstead (Mr. V. H. King for Dr. A. H. Thompson).—Refused.

Lewisham.—A porch and projecting hood, projecting roof over cantbay to the first floor, and a wooden-faced gable with hanging tiles, to a proposed detached house on the north side of Lowther-hill, Brockley-park, Lewisham (Mr. T. M. Garrood for Mr. A. F. Randall).—Refused.

Lewisham.—A one-story addition to No. 145, Sunderland-road, Lewisham, to abut upon Perry-vale (Mr. J. T. Hodson).—Refused.

Lewisham.—A one-story addition to "Vancouver House," Dacres-road, Lewisham, to abut upon Inglemere-road (Messrs. Hennell and Son for Mr. W. King).—Refused.

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Strand.—Two projecting signs in front of No. 26, Charing-cross, Strand (Mr. J. N. Taylor for the Great Western Railway Company).—Refused.

Wandsworth.†—A one-story shop upon part of the forecourt of No. 247, Upper Richmond-road, Putney (Messrs. A. W. Taylor and Co. for Mr. P. F. Taylor).—Refused.

Wandsworth.—Five houses with projecting shop fronts on the south side of Franciscan-road, eastward of Gassiott-road, Lower Tooting, Wandsworth (Mr. W. Bartholomew for Mr. P. Miller).—Refused.

Width of Way.

Deptford.—A deviation from the plans approved for the erection of buildings on the north and south sides of Blake-street, Deptford, so far as relates to the alteration in the position of the boundary fence at the east end of the buildings on the north side of the street (Mr. R. Robertson for the Housing of the Working Classes Committee).—Consent.

Hackney, North.—Buildings on the east and west sides of a roadway leading out of the north side of Farleigh-road, Hackney, between Nos. 3 and 5, with external walls and forecourt fence at less than the prescribed distance from the centre of such roadway (Mr. G. H. Capper for Mr. A. C. Jackson).—Consent.

Kensington, South.†—Retention of a studio on the south-west side of Seymour-place, Fulham-road, Kensington, with a forecourt fence at less than the prescribed distance from the centre of the roadway of Seymour-place (Mr. C. H. B. Quennell for Messrs. Ramsden and Carr).—Consent.

Lewisham.—One-story buildings at the rear of No. 118, Rushey-green, Catford, with external walls at less than the prescribed distance from the centre of the roadway of Holbeach-road (Messrs. Hatch and Hatch for Messrs. Lorimer and Co., Ltd.).—Consent.

Width of Way and Lines of Frontage.

Kensington, South.†—An addition at the rear of Campden-lodge, Campden-hill-road, Kensington, to abut upon Tor-gardens, with a boundary fence at less than the prescribed distance from the centre of the roadway of Tor-gardens (Messrs. Chesterton and Sons for Dr. R. Batten).—Consent.

Width of Way and Construction.

Brixton.—An iron and glass photographic studio at the rear of No. 28, Coldharbour-lane, Brixton, to abut upon Crawford-street (Mr. E. J. Wallis for Mr. G. Turner).—Consent.

Width of Way and Space at Rear.

St. George-in-the-East.—An addition to No. 42, Berner-street, Commercial-road, St. George-in-the-East (Mr. J. R. Moore-Smith for Mr. J. Doan).—Refused.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. C. W. Braine sanctioning the formation or laying out of new streets for carriage traffic out the the east side of Merton-road, Wandsworth, and, in connexion therewith, the widening of a portion of Merton-road (for the Wandsworth and Putney Gas Light and Coke Company).—Agreed.

Lewisham.—That an order be issued to Mr. J. M. Kennard sanctioning the formation or laying out of a new street for carriage traffic to lead from Sunderland-road to Church-road, Perry-vale, Lewisham (for Mr. E. C. Christmas).—Agreed.

Space at Rear.

Kensington, South.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building at No. 40, Hyde-park-gate, Kensington (Mr. R. J. Worley).—Agreed.

Southwark, West.—An addition at the rear of Nos. 21 and 23, St. George's-road, Southwark).—Consent.

Greenwich.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building at No. 113, The Stowage, Deptford, with an irregular open space at the rear (Mr. J. Webster for Messrs. May and Roberts).—Consent.

Wandsworth.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the south side of Franciscan-road, Lower Tooting, with an irregular open space at the rear (Mr. W. Bartholomew).—Consent.

Space at Rear and Projections.

Whitechapel.—Buildings upon a site abutting upon the north side of Whitechapel-road and west side of Brady-street, Whitechapel, with open spaces at the rear, and with projecting pilasters (Mr. H. L. Florence for the Whitechapel and Bow Railway Company).—Consent.

Deviations from Certified Plans.

Holborn.—Deviations from the plan certified by the district surveyor, so far as relates to the proposed rebuilding of Nos. 175 and 176, Drury-lane, Holborn (Mr. W. Woodward for Mr. M. Pearson).—Consent.

Means of Escape from Top of High Buildings.

Hoxton.—That Messrs. Bradshaw and Gass be informed that the Council has considered the drawings submitted by them on behalf of the Trustees of the Leysian Mission, showing the means of escape in case of fire, proposed to be provided in pursuance of section 63 of the Act, on the sixth story of the Leysian Mission-buildings, City-road, for the persons dwelling or employed therein . . . and that the Council will issue a certificate under the section.—Agreed.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

LEICESTER AND LEICESTERSHIRE SOCIETY OF ARCHITECTS.—At a Special General Meeting of this Society held on the 3rd inst., to discuss the question of statutory qualification of architects, the following resolution was passed:—

"That we, the members of the Leicester and Leicestershire Society of Architects at a Special General Meeting held on June 3rd, 1904, are of the opinion that the general principle of statutory qualification of architects, if carried through on the initiative of the Royal Institute of British Architects, is desirable in the best interests of architecture and those who practise it."

Illustrations.

SCULPTURE AT THE ROYAL ACADEMY.

THE illustrations of sculpture in these two plates are from photographs lent to us by the artists.

They are all referred to in the first article in this issue, on "Sculpture at the Royal Academy."

LECTERN, MINEHEAD CHURCH.

THIS lectern was made by Mr. Nelson Dawson for Minehead Church, where it is now in use.

It is made of forged iron enriched with brass, the desk being of oak. In the centre panel is a figure of St. John the Baptist; in the side panels are two angels. The lower panel is filled with a design of vine and grapes.

All these are of solid brass, and left bright to contrast with the wrought iron.

BURTON HALL, CHESTER.

THIS house is now being built for Mr. Henry Gladstone, by Messrs. White and Son, of Liverpool. Portions of the former house are incorporated in the west wing, forming the drawing-room, library, and bedrooms over.

The scheme includes a considerable amount of work in terraces and approaches. An enclosed forecourt is formed on the north front with a new approach road from the village. Beyond the forecourt is a raised terrace garden with lily pool, on the east side of which some old farm buildings are being adapted for potting shed, mushroom house, fruit room, etc. The north side of the terrace garden is formed by new stabling, and the west side is enclosed with a stone wall. The terraces on the west and south sides are in two stages, the ground falling from north-east to south-west, and the principal views being south and west. The house is faced with red sandstone quarried on the estate. The double entrance corridor, the music room, and parts of the dining-room and boudoir are vaulted in breeze concrete. The stairs are of concrete with oak treads. The roofs are covered with green Westmorland slates, and the ridging is of lead. The fountain court is plastered between tile dressings. The architects are Messrs. Nicholson and Corlette, of London.

"FRAMEWOOD," STOKE POGES.

THIS house is being built from the designs of Mr. Gerald C. Horsley. The materials are Lawrence's Bracknell bricks, and stone windows on the ground floor. The roof and hanging tiles are red and are hand-made.

The contractors are Messrs. Holloway Bros.

VILLA GUARDAMUNT, ST. MORITZ.

THIS villa was erected last year at St. Moritz, in the Upper Engadine Valley, Switzerland. It is situated on an elevated site above the village, 6,800 ft. above sea level, and in consequence is exposed to considerable variations of temperature. The lower part of the house is of granite obtained from the neighbouring mountains, whilst the upper floors are entirely constructed of wood. The roof is of rough green stone slates laid in diminishing courses.

The building is a combination of Swiss methods of construction with English requirements of to-day. The outer shell is formed of long baulks of timber 10 in. by 4½ in. grooved and tongued together, and halved and notched at the angles. The inner shell is attached to the outer shell by dovetailed runners to allow for the unequal shrinkage of external and internal woodwork. There is also an airspace of 2½ in. between the two shells, and a layer of isolation paper, together with one of brown paper and two of canvas, and some parts of the house are panelled in oak. The house is rendered fireproof in accordance with Swiss building regulations, and is heated by stoves and fireplaces, all leading to one central flue stack.

The masonry work was built by Gebrüder Capretz, and the wooden building was constructed at Chür, in the Grisons, thence brought by rail to St. Moritz, where it was erected by Herr J. P. Fopp, who was also responsible for the whole of the furniture. Both house and furniture were erected from the designs and under the supervision of Mr. H. Inigo Triggs, of London.

COMPETITIONS.

NEWCASTLE-UPON-TYNE GRAMMAR SCHOOL.—At a meeting of the Governors of this School, held on the 9th inst., the awards made on the plans submitted by the competing architects were as follows:—First premium, 100*l.*, to Messrs. Russell and Cooper, 11, Gray's Inn-square, London; second premium, 50*l.*, to Mr. Francis W. Bedford, 22, Old Burlington-street, London; third premium, 25*l.*, to Messrs. Ashford and Gladding, 19, New-street, Birmingham. The plans were open for public exhibition at the Town Hall, Newcastle-upon-Tyne, daily between the hours of 10 a.m. and 6 p.m. until the 16th inst. The number of plans submitted in the competition was 117, and the assessor was Mr. John Bilson, of Hull.

BOOKS RECEIVED.

MODEL ANSWERS TO QUESTIONS SET BY THE SANITARY INSTITUTE. (The Sanitary Publishing Company. 2s. 6d.)

NEAR OXFORD: a popular historical and architectural Handbook. By the Rev. H. T. Inman, M.A. (Simpkin, Marshall and Co.)

TRADE CATALOGUES.

THE British Compo-board Company send us a pamphlet giving particulars about Compo-board (which has been before noticed in our pages), with some illustrations of buildings in which it has been used. We may repeat what we have before said, that for many situations Compo-board appears to be an excellent, cleanly, and sanitary way of covering the inside of a room or a warehouse, and is well worth attention for that object.

Messrs. John Harper and Co. (Willenhall) send us a description and price-list of their patent pivot hinges (Doman's patent). The advantages claimed for these hinges are that they are easily fixed, and the doors and gates can be hung flush with the post without cutting away any of the woodwork. "The pins and straps are welded together in such a way that when fixed in their sockets sagging or dropping becomes impossible, and the door or gate will ever remain firm and upright. These hinges, being constructed on the pivot principle, are almost frictionless (the only friction being at the point of the pin in the lower socket), so that the heaviest doors or gates can be opened or closed with the greatest ease." As we have not seen an actual specimen of the hinge in position, we cannot undertake to say how far these claims are borne out. The double-strap pivot gate hinge looks in the illustration a very workmanlike fitting for heavy gates; to say that it "cannot sag when once fixed," however, is assuming that the attachment to the gate post does not give at all, which cannot always be assumed. The hinges would look better if the useless star "ornaments" were omitted. The catalogue also shows a good set of steel gutter brackets.

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Correspondence.

DISCUSSION ON PLENUM VENTILATION.

SIR,—In consequence of the late hour at which this was taken last Monday at the R.I.B.A. there was no time in which to reply to the criticisms thereon, but, with the sanction and approval of the President, our reply will be given in the next number of the R.I.B.A. *Journal*, and until this has been perused we trust judgment may be withheld.

WILLIAM HENMAN and
THOMAS COOPER, architects.
HENRY LEA and SON,
Consulting Engineers.

"A CITY TOWER OF HEALING."

SIR,—Professor Beresford Pite's design, published in your last issue, is of particular interest to me, because I have long thought that the "skyscraper" afforded the very best solution of the problem of hospital accommodation in London, and other large cities.

It is a pity, however, to spoil a good idea by illustrating it with a plan open to criticism upon so many points. No doubt it is only a rough sketch intended as a key to the drawing; but the value of the idea will be appraised upon the practicability of the plan rather than the appearance of the building.

In the first place, the cruciform plan for hospitals (notwithstanding the Victoria Hospital, at Glasgow, and University College Hospital, in London) has but few points to recommend it; the strongest being economy of means of access to the ward blocks. In this particular plan, by the way, four staircases and four lifts are shown in the centre, whereas one, or at most two, in that position would have been sufficient. It would be necessary to provide another at the further end of each ward block, otherwise they would be veritable death-traps in case of fire.

Then it is to be noted that the towers at the ends of the wards are to contain operating theatres, sanitary offices, and ward kitchens. In the perspective it would appear that the first and third are wisely omitted in favour of open balconies.

It is difficult to say upon what scale the buildings are drawn. Measured by that immediately below the plan, the wards would be about 50 ft. wide; and the length of the beds (which are shown under the windows), if taken as a guide, would appear to bear out this very unusual width.

Apart from these matters, Professor Pite has done good service in bringing the matter once more to the front and illustrating it by a sketch, which will go far to stir the imagination of those who have, or may have, to deal with the problem of hospital accommodation in large cities.

A. SAXON SNELL.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the Managers was held on Saturday last week at the Offices of the Board, Victoria Embankment, Mr. Scovell presiding.

Leavesden Asylum.—On the recommendation of the Finance Committee, it was agreed to apply to the Local Government Board for an order authorising the expenditure of 1,800*l.* on the execution of certain work at the laundry at this asylum.

South-Eastern Ambulance Station.—The Works Committee recommended, and it was agreed, that Messrs. W. H. Barber and Sons be appointed to measure certain variations on Mr. W. Reason's contract for additional accommodation for nurses at this station.

Western Hospital.—The Engineer-in-Chief submitted a plan for the provision of additional male staff mess-room and store accommodation at this hospital, and, on the recommendation of the Committee, the plan was adopted and forwarded to the Local Government Board.

Eastern Hospital.—The Works Committee reported having received a communication from Messrs. Hayward Bros., and Eckstein, whose tender was accepted for the erection of fire-escape staircases, both at the Eastern and the South-Western Hospitals, stating that by an error their tender forms for those works had become transposed while being filled up, and that their tenders ought, respectively, to have been—for the South-Western Hospital, 570*l.*, and for the Eastern Hospital, 699*l.*, and not *vice versa*. They further stated that, whilst they were prepared to carry out the works at the Eastern Hospital for the sum of 699*l.*, which would have been the amount of their tender if the error had not occurred, they were not prepared to sign the contract at the amount at which their tender was accepted by the Board. On the recommendation of the Committee, it was agreed to accept the revised tender.

Darenth Asylum.—The Asylums Committee reported that the Commissioners in Lunacy, who recently visited the asylum, urged the importance of replacing certain windows in the ground floor dormitories by doorways for use as fire exits, and suggested that cross-walls should be built in the corridor subways to prevent them from acting as flues in an outbreak of fire. In reporting on the matter, the Darenth Sub-Committee said:—"The question of fire exits was carefully considered by us in connexion with the report of the Commissioners last year. We then formed the opinion that the value of the new doors as fire exits would not be sufficient to justify the large expenditure which would be incurred in their provision. But, as the Commissioners still feel that doors should be provided, we suggest that one window in each of the ground floor dormitories of blocks 6 and 8 should be converted into a doorway by the removal of the lower sash of the window and the brick wall from the sill to the floor, and by fixing a door to open outwards. As regards the provision of cross walls in the corridor subways, we agree that some protection of this sort would be advisable. We, therefore, suggest that a 4-in. wall should be erected across the subway leading from the male to the female side of the asylum, and that fire-proof doors should be placed at the foot of each of the stairways leading up from the subway." On the recommendation of the Committee, it was agreed to sanction the execution of the work suggested, and the matter was referred to the Works Committee to be dealt with. The Committee reported that the tar paving in many of the airing courts of the asylum was badly perished, and it was agreed to execute the necessary repairs at a cost of 386*l.*

Eastern and Western Hospitals—Internal Telephones.—It was agreed that a system of internal telephones should be installed in both these hospitals, in accordance with schemes prepared by the Engineer-in-Chief. The estimated cost is 280*l.* for the Eastern Hospital, and 300*l.* for the Western Hospital.

Supply of Electricity.—It was agreed to accept the following charges for the supply of electricity to the hospitals:—Hackney Borough Council, for the supply of electricity to the Eastern Hospital and Ambulance Station, at the rates of 4d. per unit for current for lighting purposes (subject to certain discounts), and 2d. per unit net for power purposes. Fulham Borough Council, for the supply of electricity to the Western Hospital and Ambulance Station, at the rate of 5d. per unit for an average consumption of 12 units per 8 c.p. lamp per annum; 4d. per unit for an average consumption of between 12 and 24 units per 8 c.p. lamp per annum; and 2d. per unit for all units consumed over and above an average of 24 units per 8 c.p. lamp per annum.

Western Hospital.—It was also agreed to enlarge the engineers' and carpenters' shops at this hospital at a cost of 250*l.*

Fountain Hospital.—It was decided to retain the building, known as the architect's office, and to treat it with fire-resisting material. Messrs. T. W. Aldwinckle and Son submitted an estimate of 165*l.* for the work.

The Student's Column.

ARCHES.—XXIV.

AS stated in Article XXIII., arch centring is built of different materials, and must always be specially designed to suit the conditions of every given case.

In the present article we describe and illustrate some types of arch centring commonly used, and also give examples from actual practice. As a matter of convenience, the following notes refer only, except where otherwise stated, to the construction of the separate ribs forming the chief members of the centring.

Solid Timber Ribs.—For small arches of low rise, the rib may be formed of two planks (as in Fig 100, where the arch is of 10 ft. span and the rise 1 ft. 4 in. The plank *a a* is 11 in. wide and 2 in. thick, while the plank *b*, of the same thickness, is 11 in. wide at the crown, and trimmed to suit the curve of the arch. The two planks are joined by cleats which are fastened by nails, as shown in the figure. Ribs of this kind should be placed about 2 ft. 6 in. apart, and carried on longitudinal timbers held in position by vertical posts, standing on planks laid in the earth, or otherwise supported. On the upper surfaces of the ribs the laggings are laid in position, as indicated in Fig. 100.

Built-up Timber Ribs.—For arches of 10 ft. to 30 ft. span with small rise, the rib is often formed of two or three thicknesses of short boards fitted and fastened together so as to follow the curve of the arch approximately, as in Fig. 101. The outer edges are then trimmed so as to be concentric with the intrados of the arch ring, leaving room for the attachment of the laggings. Such ribs are generally spaced about 1 ft. 6 in. apart, and supported by longitudinal rails and posts, as before described. The separate thicknesses of the ribs may be bolted, screwed, or nailed together according to circumstances, and sometimes it is advisable, for the sake of securing additional stiffness, to bolt steel coverplates over the joints, as shown in Figs. 102 and 103.

Built-up ribs possess great strength, and two examples given by Trautwine may here be usefully quoted.

In the first of these the centring was applied to a semi-circular arch of 35 ft. span, the ring being 2 ft. thick. Each rib consisted of two thicknesses of 2-in. plank, in lengths of about 6.5 ft., treenailed together so as to break joint. Each piece of plank was 12 in. wide at the middle, and 8 in. wide at each end, the top edge being cut to suit the curve of the arch. The treenails were of 1.25 in. diameter, and twelve of them were used to each length of plank. These ribs were placed 17 in. apart from centre to centre, and were steadied in position by bridging pieces, of 1-inch board, at each joint of the planks, or about 3.25 ft. apart. Headway for traffic being necessary under the arch, there were no chords to unite the opposite feet of the ribs. The ribs were covered with close board-lagging, which also assisted in bracing them transversely. As the arch approached about two-thirds of its height on each side—during construction—the ribs began to sink at the haunches and rise at the crown. This was rectified by loading the crown with stone to be used in completing the arch, which was then finished without further trouble.

In the second example, the centring was employed in the construction of an elliptical arch of 60 ft. span with a rise of 15 ft., the ring being 3 ft. thick at the crown and 4 ft. at the springing. Each frame of the centre was a simple rib 6 in. thick, composed of three thicknesses of 2-in. oak plank, in lengths varying from 7 ft. to 15 ft., to suit the curve of the arch, and at the same time to preserve a width of about 16 in. at the middle of each length and of 12 in. at each of its ends. The segments broke joints, and were well treenailed together with from ten to sixteen treenails to each length. These ribs (the ends of which were not connected by chords) were placed 18 in. apart, centre to centre, and were steadied in position by board bridging-pieces, 1 ft. long, at intervals of 5 ft. When the arch stones had been built to within about 12 ft. of each other near the middle of the span, the sinking of the crown and the rising at the haunches had become so great that it was thought necessary to insert pieces of 12-in. square oak at intervals which were wedged against the arch stones at their ends, thus relieving the centring of a strain which threatened its safety. The arch was then finished in sections between the timbers, which were removed one by one as the masonry was completed.

While centring with ribs of the construction here described is very strong, it is lacking in stiffness, and for this reason there is some risk that, owing to its flexibility, the stability of the arch may be endangered during erection, and that the adhesion of the mortar may be partly destroyed, thus leading to a permanent diminution in the strength of the completed arch.

Built-up ribs have been largely used in tunnel construction for spans varying from 20 ft. to 30 ft., precautions being generally taken to make sound joints, and to bolt the segments firmly together.

For a 25-ft. arch the timber segments should be of 3-in. plank in pieces 5 ft. 6 in. long, 14 in. wide at the middle and 8 in. wide at the ends, secured with ½-in. bolts through the timber, and ¾-in. bolts through the steel coverplates and timber between them. The coverplates should be at least 14 in. long by 8 in. wide. Two thicknesses of 3-in. plank will be sufficient under ordinary circumstances, but if the earth pressure is considerable, as it often is in tunnel construction, three thicknesses should be used It is always desirable to connect the ends of the ribs by timber ties, which may be formed

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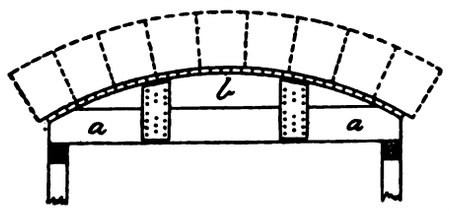

FIG. 100

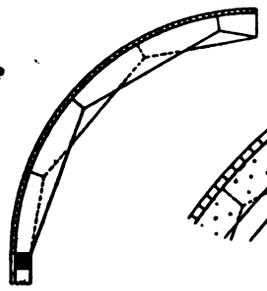

FIG. 101

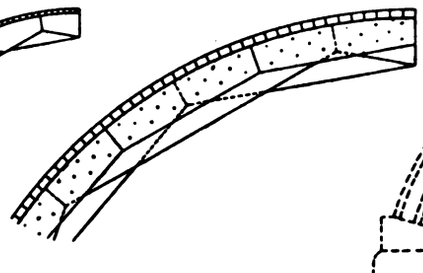

FIG. 102

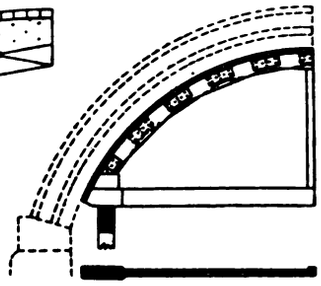

FIG. 103

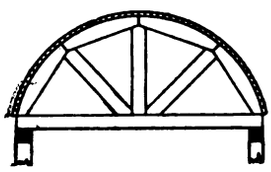

FIG. 104

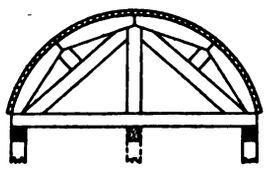

FIG. 105

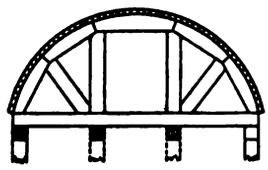

FIG. 106

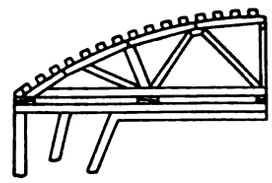

FIG 107

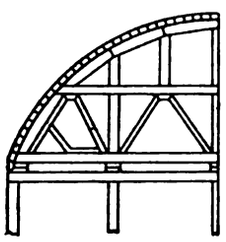

FIG. 108

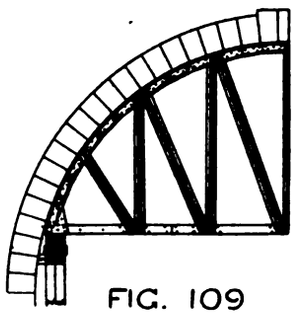

FIG. 109

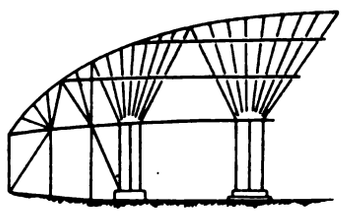

FIG. 110

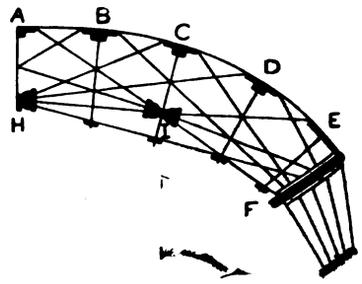

FIG. 111

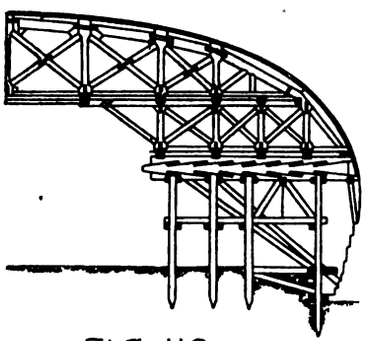

FIG. 112

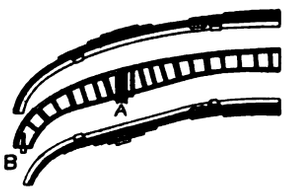

FIG. 113

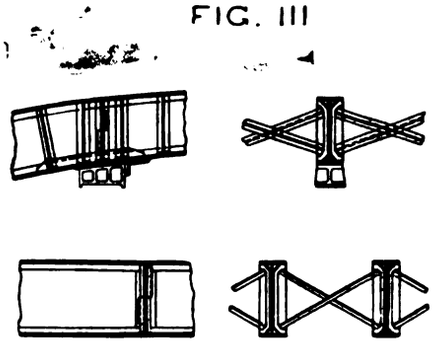

FIG. 114

by nailing two boards on each side of the ribs. Ties of this kind are useful in preventing any tendency of the ribs to spread in an outward direction and so to press against the masonry, thereby interfering with the subsequent striking of the centring. Such ties are also useful for keeping the ribs in form while they are being conveyed to, and placed in position.

Braced Timber Ribs.—By the addition of a horizontal chord and a vertical tie to the type of timber rib shown in Fig. 100, we have a simple type of braced rib as illustrated in Fig. 103, which represents the centring used for the construction of the Vosburg Tunnel on the Lehigh Valley Railway, U.S.A. It will be seen that the two ends of the rib are united by a timber chord formed of two planks between which and the crown is a vertical tie, the whole forming a simple but fairly rigid truss. The joints of the timber segments are secured by steel coverplates, as shown in the figure.

For the purpose of giving greater stiffness, the rib may be further braced, as indicated in Figs. 104, 105, and 106, or by any desirable modifications of these simple designs. The exact form of bracing for adoption is sometimes governed by the width of the passage required beneath the arch for constructional or other purposes. The rib in Fig. 104 is supported only at the ends, leaving a clear passage almost the full width of the span; that in Fig. 105 can be supported only at the ends, but sometimes it may be desirable to place a post in the middle, as indicated by dotted lines; and that shown in Fig. 106 may be supported at two intermediate points as well as at the ends. It may here be noted that as the masonry near the springing of a semi-circular arch is self-supporting, it can be laid up to a certain level without the aid of centring, hence the latter need not extend down to the springing. An illustration of this is afforded by Fig. 103.

For large spans, simple types of the braced rib do not afford sufficiently rigid support, and resort must be made to more elaborate forms of bracing, of which some diagrams are here given. The mechanical principles underlying the design of such trusses are fully discussed in numerous text-books on roof and bridge construction, and need not be entered upon in this series of articles.

Figs. 107, 108, and 109 show three commonly-used trussed ribs, providing ample strength and rigidity. The rib represented in Fig. 107 affords a clear passage nearly the full width of the arch and for this reason may often be more convenient for adoption than the form shown in Fig. 108. Fig 109 represents the type of centring employed for the Pennsylvania Railway Bridge at New Brunswick, N.J.

Fig. 110 is a diagram of the centring designed by Sir Charles Hartley for the Grosvenor Bridge at Chester, in which most of the supports were struts radiating from iron shoes fixed on the top of the temporary stone piers, of which there were four in the length of the span. The struts were stiffened by waling pieces spaced at distances varying from 10 ft. to 12 ft. apart vertically, and the back pieces consisted of two thicknesses of 4½-in. planks.

Fig. 111 is a diagram of the centring employed for the erection of Waterloo Bridge. The centring consisted of inclined struts in pairs. Each joint in the back pieces A to E was independently supported by a pair of struts of its own, springing from the striking plate at F. At points where several of these struts intersected, as at H and I, they were connected by suitable cast-iron shoes, while at other points of intersection they were simply notched and bolted together. Additional stiffening pieces were added, as shown in the diagram. The striking plates were longitudinal and inclined, and were supported on struts springing from the stepped bases of the bridge piers.

Fig. 112 exemplifies trussed girder centring as used in the construction of London Bridge. In this case direct support was given for the distance of about one-fourth of the span, while across the middle half the rib was a diagonally braced girder of great stiffness.

Steel centring is sometimes used under conditions when timber would be unsuitable, or impracticable. The type of construction is well illustrated by the centring employed in connection with the King Edward VII. Bridge at Kew. Owing to the requirements of the Thames Conservancy, it was found necessary to make use of steel centring, which consisted of curved ribs, as represented in Fig. 113, which shows half the rib for the middle span of the bridge. The ribs were supported at the points A and B, and at two corresponding points on the other half of the span. Each rib was a curved girder, built up of steel plates and angles, having an average depth of 3 ft. 7 in., and a width of 1 ft. 4 in. The girders were delivered in five sections, two at each end being riveted up on the site, floated out on barges to the required positions, and then hoisted up to their temporary supports. The middle section was also floated out, hoisted up, and temporarily supported by projecting coverplates on the side sections, the remaining coverplates being afterwards riveted on.

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The details of the top and bottom plates of the flanges are diagrammatically represented in Fig. 113.

The width of the bridge between the parapets is 55 ft., and eleven ribs were employed beneath each arch, spaced 5 ft. 7 in. centre to centre. Details of the bracing between the ribs are shown in Fig. 114, where the two upper sketches relate to the bracing at the intermediate supports, such as at the point A in Fig. 113, and the two lower sketches relate to the bracing at the stiffeners elsewhere along the ribs. The weight of each rib for the centre span was twenty-three tons.

It will be seen that when completed the centring practically constituted a steel arch of great strength and stiffness, the ends being carried at the springings by timber framework built up on the footings of the piers. The ends of the ribs rested upon a 14-in. square horizontal timber, between which and the top timber of the framework hard wood wedges were inserted in pairs beneath each rib. The intermediate supports below the points A and B (Fig. 113) consisted of two rows of piles placed 9 in. apart, these piles being driven about 7 ft. below foundation level. Cast-iron saddles were bolted to the ribs at the point A, so as to give a horizontal bearing surface of adequate area, and between these saddles and the top timber of the piling, wedges and sand boxes were placed. These sand boxes will be described when reference is made to the striking of arch centres.

After the ribs had been finally fixed in position and braced together, a 4-in. timber lining was bolted to the top flanges to correct any slight irregularities in the curvature of the centring, and across this lining, laggings of 8-in. by 4-in. timbers were spiked.

For the purpose of obviating any risk of undue stress or of opening at the bed joints of the arch, in consequence of deflection of the centring, some of the joints were left dry, small timber wedges being inserted to maintain the spacing, and when the arch had been completely built these joints were filled with mortar.

OBITUARY.

MR. BROOKER.—We have to announce the death, very suddenly, on June 6, at East Dulwich, of Mr. James William Brooker, aged fifty-one years, of No. 13, Railway-approach, London Bridge, S.E., and of "Durlstone," Brockley Park, architect and surveyor. Mr. Brooker was elected an Associate of the Royal Institute of British Architects in 1887, and a Fellow in 1892; he also held a certificate of competency to act as an official surveyor. Amongst his chief professional works during the past twenty years or so are comprised the following:—Buildings in Finsbury-pavement for the Finsbury Estates Company, in 1883-4; residences in Vine Court-road, Sevenoaks: business premises in Denman-street, London Bridge, and (Nos. 173-4) in High-street, Shoreditch; houses in Grove-vale, East Dulwich; Dock-street, E.; Half Moon-lane, Herne-hill; Brockley-rise; Lewisham; and elsewhere in the southern suburbs; buildings on the Sayer-street and Lion-street area, Walworth; the Penge New Tabernacle, with alterations and improvements, for the trustees of the chapel in Maple-road, Penge; and the Imperial Hall in Grove-vale, East Dulwich, for the Hall Finance Syndicate. Mr. Brooker was employed in the laying-out for building purposes of various properties in Dulwich and the vicinity, and made the plans and designs for the rebuilding of several large hotels and public-houses, amongst them being the "Coach and Horses," in Clerkenwell; the "Duke of Devonshire" hotel, with extensive additions, in Balham High-road; the "Spanish Patriots," in Lower Marsh, Lambeth; the "George," on Tower-hill, E.C.; the "Pagoda," in Bermondsey New-road; and the "Hop Pole," in Bridge-road, Hammersmith.

MR. J. Y. MCINTOSH.—The death is reported of Mr. John Y. McIntosh, architect, at Sparkbridge, near Greenodd, in Crake Valley, at the age of fifty-four. Mr. McIntosh had been architect for a number of the schools in the borough, schools at Ulverston, the buildings belonging to the Barrow Co-operative Society, Ltd., and for numerous minor buildings. His latest work was the Hotel Majestic, near the General Post Office, which is nearing completion.

NEW RECREATION GROUND, NOTTINGHAM.—The new Radford recreation ground, at Nottingham, was opened recently. The grounds have been laid out from the plans of Mr. F. B. Lewis, the City Architect, and the cost of the work has been about 5,000*l.*

GENERAL BUILDING NEWS.

UNITED METHODIST FREE CHURCH AND SCHOOLS, SEVEN KINGS, E.—The competitive designs, submitted by Messrs. George Baines and R. Palmer Baines, of London, have been adopted for this church and schools, and the first portion of the building, which embraces the nave of the church, including tower and temporary apse, etc., is to be proceeded with at once; also the school-room and two class-rooms from a portion of the scheme. The estimated cost of this first portion is 3,641*l.* The materials are to be facings in red brick, with dressings in Bath stone. The tender submitted by Mr. C. North, which amounts to 3,488*l.*, has been accepted.

WESLEYAN CHAPEL, DAVYHULME.—On the 11th inst., the stone-laying ceremony took place in connexion with the new Wesleyan chapel which is being built in Brook-road. The chapel is to cost 4,500*l.*, and provide seating accommodation for 700 worshippers. Land has been secured in the rear for a lecture hall and class-rooms. Externally the building is faced with Accrington bricks, the mouldings and dressings being in Accrington terra-cotta. Messrs. Smith and Matley, Manchester, were the architects.

NEW MISSION HALL, WORCESTER.—The new mission hall, which has been erected in Victoria-avenue, Worcester, was opened recently. The new building, which is designed in the late Gothic style, has been erected of red brick with white stone facings. The plans were prepared by Mr. A. Hill Parker, architect, and the work was carried out by Messrs. Bromage and Evans, contractors.

WESLEYAN MEMORIAL HALL, DENBY DALE.—A new Wesleyan Sunday School and Queen Victoria Memorial Hall was opened on the 11th inst, at Denby Dale. The building, which is estimated to cost 4,000*l.*, will accommodate 600 persons. The style is Renaissance, and the principal entrance is to be surmounted by a statue of Queen Victoria. The work has been carried out from plans prepared by Mr. G. Moxon, architect, Barnsley.

CLERGY HOUSE, SMALL HEATH.—A new clergy house has been erected adjoining St. Aidan's Church, Herbert-road, Small Heath. The building is three stories high, and is built of red brick, with free-stone dressings. Mr. Arthur Dixon is the architect, and the total cost will be about 1,600*l.*

SCHOOL, DUDLEY.—A new upper standard school at Blower's Green, Dudley, has just been opened. The erection and complete equipment of the school will cost between 16,000*l.* and 17,000*l.*, and the architects were Messrs. Barrowcliff and Allcock, of Loughborough, whose plans were selected in competition by Mr. T. J. Bailey. The builder was Mr. Mark Round, of Dudley. The school has accommodation for about 500 boys and girls. Externally a simple Renaissance treatment has been adopted, the main building being faced with bricks with terra-cotta dressings. It has been built upon the central hall system. The hall, which is 62 ft. by 25 ft., is lighted from the roof, and has a wide balcony on the level of the first floor. Twelve class-rooms open into this hall, six upon the ground floor for boys and the same number on the first floor for girls. Cloakroom and lavatory accommodation is provided for each department, and separate sitting-rooms for male and female teachers in convenient positions. Two separate class-rooms for the training of deaf mutes are situated at the north end of the building and are specially arranged for the teaching of lip-reading. They have separate entrances, playgrounds, etc., and form a distinct department, though connected for supervision by a corridor with the central hall. Above these two class-rooms is an art-room, 42 ft. by 18 ft., lighted exclusively from the north side. At the south end of the site a two-story building attached to the main building contains the rooms devoted to manual training and the teaching of cookery and laundry work. Advantage has been taken of the rapid fall of the ground to place the manual training room at the level of the basement, but still with windows clear of the ground. This room, which is 70 ft. by 22 ft will be fitted up with benches, lathes, and other machinery for metal work, and provides all necessary storage accommodation. Above the manual training room, and connected by a covered way, are the cookery and laundry rooms. Above the cookery and laundry department, chemistry and physics laboratories can be added at the level of the first floor, and there is also provision made for a future extension of class-rooms on the east side. At the north end of the site is the caretaker's house, with separate yard and garden. The buildings throughout are fitted up with the electric light.

SCHOOLS, GREYSTONES, YORKSHIRE.—New elementary day schools at the corner of Greystones-road and Tullibardine-road, Sheffield, have just been opened. The building is to accommodate 540 children, and at present contains a central hall, 93 ft. by 34 ft., round which are grouped three class-rooms for sixty scholars each, space being left at one end for three additional class-rooms should extension be necessary. The class-rooms open into the hall, and glazed screens are inserted between them. The hall is divided by a glazed partition into two equal portions, one being used in connexion with the mixed boys' and girls' class-rooms, and the other in connexion with the infants' class-rooms. The lower portion of the screen is sliding. There are four entrances, one for girls, another for boys, and two for infants. There are cloak-rooms for each department, and over each is placed a teachers' room. Advantage has been taken of the slope of the ground to obtain a covered play shed under the class-rooms on the Tullibardine-road front. A caretaker's house is also provided. The buildings are faced all round with rock-faced stone from the Bole Hill quarries, with ashlar stone dressings from Mr. Turner's quarries at Stoke. The whole of the internal woodwork is pitch-pine, varnished. The buildings were designed by the late Mr. W. F. Hemsoll and Mr. H. L. Paterson in conjunction, and the work has been carried out under the supervision of Mr. Paterson, while Mr. F. Ripley has acted as clerk of works. The cost is 10,795*l.*, exclusive of site. Messrs. Ash, Son, and Biggin are the general contractors. The heating is by hot water.

MARINE SCHOOL, CLONTARF.—On the 8th inst. the Lord Lieutenant of Ireland performed the opening ceremony of the new Hibernian Marine School, Seafield-road, Clontarf. The school accommodates fifty boys, who will be trained for the Royal Navy or the merchant service. The building was commenced eighteen months ago, and cost 7,500*l.* The architect was Mr. R. Caufield Orpen, the contractor being Mr. R. A. Millar. The internal plumbing and sanitary arrangements and hot water supply throughout the building have been carried out by Messrs. Maguire and Gatchell.

NEW PARISH SCHOOLS, DUBLIN.—The foundation-stones of the new parish schools, which are to be erected at Dolphin's Barn, Dublin, were laid recently. The new buildings will consist of boys' and girls' schools, with master's residence. Accommodation has been provided for 100 boys and a like number of girls. Each school consists of a school-room, 30 ft. long and 22 ft. wide, and a class-room, 17 ft. by 14 ft. The school-rooms are lighted on both sides, and the class-rooms at the ends and sides. The cloak-rooms to each school are to be 14 ft. by 10 ft. The heating will be by hot water, but fireplaces are provided in each school and class-room. The materials generally are brick for the walling, with Portmarnock facings; the roofs will be covered with Bangor slating; the floors of the school-rooms are to be of wood, laid solid; the passages, cloak-room, etc., being tiled. The total cost will probably exceed 3,200*l.* Of this sum 700*l.* will be expended in the erection of the master's residence. The schools proper will cost about 2,500*l.* (this includes the price paid for the additional site). The architect is Mr. J. Franklin Fuller, F.S.A., Dublin, Mr. John Pemberton, Dublin, being the builder.

SCHOOLS, PONTLOTTYN.—New schools have been erected on the New-road, at Pontlottyn. The contractor was Mr. J. Lewis, Caerphilly, and the architects, Messrs. James and Morgan, Cardiff. The building, which has been erected as a boys' and girls' school, in separate departments, provides a total available accommodation for about 800 scholars. The cost of the buildings is about 14,500*l.*

SCHOOL, SHEFFIELD.—The new department for infants at Western-road Council School, Sheffield, was opened on the 13th inst. Messrs. Holmes and Watson are the architects. There are entrances from Western-road and Warwick-street, into the playgrounds. The buildings are faced externally with rockies from Bole Hill Quarries, and the ashlar from Matlock. The schools are heated on the low-pressure hot water system. There is a large asphalted playground, with covered playshed, in which are drinking fountains. The out-offices are lined with glazed bricks, and the floors are of blue stone. The contract has been carried out by Mr. William May, of Walkley.

AMBULANCE DRILL HALL, ACCRINGTON.—A new ambulance drill hall has been erected in King-street, at a cost of 2,500*l.*, and was opened on Saturday, June 11, by General Baden-Powell. The whole of the premises are on the ground floor, and comprise the hall, 69 ft. long by 56 ft. wide, with rooms at each end for officers, men, and storekeeper, and a lecture-room. Lavatories for both sexes are provided, and the whole of the premises are heated by hot water, and lighted by electricity and gas. The ambulance van-house is placed next the front entrance, and arranged so that the van can be run into the drill hall for practice in loading and unloading. The buildings are of

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brick and terra-cotta, and the floors are of maple blocks and tiles. All the walls are plastered and painted, and the woodwork of pitch-pine, varnished. The architects are Messrs. Haywood and Harrison, of Accrington and Lytham.

NEW POLICE-STATION, ASHTON.—The new police-station at Ashton, which has been erected in Old-road, was opened recently. The premises were designed by the County Architect, Mr. Henry Littler, and are in the Gothic style. The bricks are from the Huncoat Plastic Brick and Terra-cotta Company, and the stone is from the Darley Dale quarries. The interior glazed bricks were supplied by Messrs. Shaw and Co., Blackburn. The stonework was erected by Mr. W. Winnard, Wigan, and the plumbing and painting were carried out by Messrs. W. Gaskell and Sons, Wigan. Mr. Peter Pennington, Ashton, was the contractor, and Mr. T. Parker was the clerk of the works. The hot-water system, by means of which the buildings are heated, has been installed by Messrs. A. Seward and Co., Lancaster.

PROPOSED SOLDIERS' HOME, SHEFFIELD.—It is proposed to erect a new Soldiers' Home on a site at the corner of Langsett-road and Hammerton-road. The new site is considerably nearer to Hillsborough Barracks than that on which the present home stands. The new home is to cost 3,000*l.*, and plans for it, prepared by Mr. G. M. Wilson, architect and surveyor, have been accepted.

PROPOSED REFUSE DESTRUCTOR, FELLING, NORTHUMBERLAND.—On the 25th ult., at the Council Offices, Felling, Mr. M. K. North, M.Inst.C.E., held an inquiry, on behalf of the Local Government Board, into a proposal of the Felling Urban District Council to borrow the sum of 11,000*l.* for the provision of a refuse destructor on a site adjoining Stoneygate-lane. Mr. Bolam, Clerk to the Council, explained that hitherto the refuse had been used for levelling-up purposes. The Council unanimously decided to erect a destructor. The estimated population of Felling and district, including Pelaw, was 24,200, and the ratable value of 65,751*l.* The site, consisting of 2½ acres of land, had been obtained from the Ecclesiastical Commissioners. Mr. Dykes, the engineer, explained the plans.

GENERAL HOSPITAL, NORTHAMPTON.—New wings have just been opened at this hospital by the Lord Lieutenant. The new buildings are erected of white brick, with stone facings. Both buildings, whilst distinct from the future administrative department, have communication with it on every floor. The new erections consist of two pavilions of three stories each, connected with each other by a glass-covered corridor, running east and west, which is joined at right angles by a central corridor leading directly off from the main hall of the old building. From the corridor a subway to the kitchen has been constructed, and along this has been laid a tram-line to enable food to be easily and quickly distributed to the wards. Containing altogether 150 beds, one block is allocated to male patients and the other to females, the arrangement and provision being identical in either case. The three floors are practically identical in each of the pavilions. The large wards on the ground floor are devoted to surgical cases, and the only particular in which they vary from those above them is that the flooring is of terazzo mosaic instead of teak wood. The walls are finished with Keen's cement and Ripoline. Between every bed an electric light has been suspended, electric fans for the extraction of impure air from the wards have been fixed, and electric foot warmers are provided. The bath-room and offices are separated from the far end of the wards by cross-ventilated passages, and outside each ward is a verandah. From each of these balconies descend iron staircases for use in case of fire, whilst at the other end of each floor, from the main staircase, are covered fireproof bridges connected with the old buildings, and these can be utilised in case of similar emergency. Each block has been furnished with a lift, in which patients will be removed and the food distributed to the different floors. Before reaching the chief ward, there are several other rooms opening off from the main corridor of each floor. These include a four-bedded ward, intended largely for convalescents, and a nurses' duty room. There is also a single-bedded ward, minor operating room, ward kitchen, and rooms for patients' clothes, linen, pantries, and coal stores. The architect for the scheme is Mr. F. W. Dorman, with Dr. Greene acting in an advisory capacity; whilst the new building has been carried out by Mr. H. Martin, J.P.; Messrs. Lee and Warren have been responsible for the electric lighting installation; and Mr. Ambrose Marriott, Higham Ferrers, for the heating system; while the floors have been especially polished by Ronuk, Ltd., Brighton.

LIBRARY, CLITHEROE.—The plans for the proposed new Carnegie Library for Clitheroe have been approved by Mr. Carnegie. The designs for the building have been prepared by Messrs. Butterworth and Duncan, architects, of Rochdale. The cost of the building will be 3,000*l.*, and the site, which is in the centre of the town and adjoins the Town Hall, has cost the Corporation close upon 2,000*l.* Accommodation will be found in the building for a library of 15,000 volumes, with committee, reading, and students' rooms.

ADDITION TO ECCLESALL WORKHOUSE, SHEFFIELD.—A new block of buildings has been erected for the old and infirm inmates of the Ecclesall Workhouse. It is built of Stoke Hall stone, and is 200 ft. long, and in the centre is 22 ft. wide. Accommodation is provided for 100 inmates. There are four day-rooms, eleven bedrooms, lavatories, bathrooms, attendants' and store rooms, and kitchen. The floors are generally of wood, with marble terrazo paving in the lavatories, bathrooms, and corridors. Keith's high-pressure incandescent gas lighting apparatus has been installed. The contract for the building was let to Messrs. John Vassey and Son for 7,500*l.*, and the total cost, including furniture, is estimated at 8,500*l.* The architects were Messrs. W. H. Lancashire and Son.

DOGS' HOME, LIVERPOOL.—The new premises of the Liverpool Temporary Home for Lost and Starving Dogs was recently opened. The site of the new buildings abuts on the Wavertree Park, and the total cost of the work has been about 2,000*l.* Mr. F. Brice Hobbs, architect, designed the buildings, Mr. Isaac Dilworth being responsible for the erection of the kennels and offices.

BATHS, CAMBERWELL.—The foundation-stone of the municipal baths in the Old Kent-road was laid recently by the Mayor of Camberwell (Mr. H. R. Taylor, J.P., L.C.C.). The buildings occupy a site at the corner of Marlborough-road, in the Old Kent-road, and the accommodation provided is as follows:—Two swimming baths, first and second class, each with a water area of 75 ft. by 30 ft.; thirty men's first-class slipper baths; forty-four second-class, with five rain douche and spray baths; eight ladies' first-class and sixteen ladies' second-class slipper baths, and six rain douche baths. A Russian vapour bath, which will accommodate nine persons at one time, is provided for the second-class bathers. For the first-class bathers there is a Turkish bath to accommodate twelve persons at one time, with plunge bath attached. The public wash-house provides accommodation for forty-six washers, and tanks to store 60,000 gallons of cold water are provided over the wash-house. A feature of the plan is that the first-class swimming bath has been arranged, having in view the use to which it will be put for ordinary bathers and swimming entertainments in the summer, and, when floored over, for use as a public hall in the winter. A separate entrance, with crush halls, cloak-rooms, with artistes' rooms at the platform end, will be arranged. A well has been sunk to provide water for the establishment, and has been tested to yield from 12,000 to 16,000 gallons per hour. The estimated outlay upon the establishment, including the cost of engineering, engines, pump for well, and electric light plant, is 55,000*l.* The gold lettering on the foundation-stone was voluntarily executed by Mr. Nathaniel Hitch, who is executing the carving in the building. Mr. A. N. Coles was the builder, and Mr. E. Harding Payne was the architect.

ISOLATION HOSPITAL, WHARFEDALE, YORKSHIRE.—The new hospital which has been erected at Menston by the Wharfedale Union Isolation Hospital Committee for the treatment of infectious diseases was opened on the 1st inst. The hospital, which has been erected from the designs of Messrs. Blackwell and Thompson, architects, of Leicester, is situated just off the main road to Burley-in-Wharfedale, and consists of seven distinct blocks of buildings, which, with the exception of the porter's lodge and the administrative block, are all of one story. The scarlet fever block of two wards provides accommodation for fourteen to twelve beds respectively, whilst the typhoid fever block has ten beds. The isolation pavilion provides for six beds, and there is also a laundry, stable, and boiler-house. The administrative block provides accommodation for matron, nurses, and doctor's dispensary, with servants' bedroom on the first floor. The total cost of the building and site is 17,793*l.*

IMPROVEMENTS TO THE STATION HOTEL, PERTH.—The improvements which have been carried out in connexion with this hotel have now been completed. The contractors for the work were Messrs. Thomas Leith and Co., Ltd., of Perth, while the furniture and furnishings are supplied by A. Gardiner and Son, Glasgow. The plans were prepared by Mr. A. G. Gordon, the North British Railway Company's architect, under whose supervision the work was carried out.

CHILDREN'S CONVALESCENT HOME, FILEY, YORKSHIRE.—The opening of the Rotherham and District Children's Convalescent Home at Filey took place a short time ago. The new building has been erected from the plans of Mr. J. E. Knight, architect, Rotherham.

CONSUMPTION HOSPITAL, LIVERPOOL.—A new hospital for consumptives is now in course of erection in Mount Pleasant, Liverpool. The new building will be in two distinct parts—one for patients, and the other for administrative purposes. It will have accommodation for fifteen males and fifteen females, and there is a third block for out-patients. On the ground floor is a day-room for the women, and a day-room and smoke-room for the men, with a dining-room midway between the two, all facing the south. There are doctors' rooms, lavatories, etc. The first floor contains two dormitories and two single rooms, with a flat roof adjoining. Centrally placed is the nurses' duty room, and on the second floor there are eight single sleeping-rooms. There is accommodation for seven nurses in the administrative block, and a servants' room also. Verandahs will be provided. The building is of buff terra-cotta, of varying shades, from the Bispham Hall Company, Orrell, whilst red Accrington bricks have been used. There are fire-proof floors throughout, and the building is lighted with electricity. The architects are Messrs. Grayson and Ould, Liverpool, and the contractors are Messrs. J. Gerrard and Sons, Swinton, Manchester. The total cost is about 12,000*l.*

KNOX MEMORIAL HALL, MONKSTOWN, IRELAND.—The new Knox Memorial Hall at Monkstown is now nearing completion, and will be opened shortly. The building has a main hall which will accommodate 300 people, and a smaller hall capable of seating sixty persons. Mr. Millar, of Messrs. Millar and Symes, architects, Dublin, prepared the plans for the work, and the contractor was Mr. T. C. Joly, Blackrock.

ISOLATION HOSPITAL, ROTHWELL, YORKSHIRE.—A new isolation hospital has been erected at Rothwell, the foundation-stone of which was laid in October, 1902. The architect was Mr. W. E. Richardson, of Rothwell. There are seven separate blocks of brick buildings, embracing three hospitals, which provide twenty-eight beds. It was estimated that the total cost, inclusive of the site, would be 10,900*l.*, but the actual expenditure, which includes the cost of furnishing, has not exceeded 8,500*l.*

BUSINESS PREMISES, ABERDEEN.—New business premises are about to be erected in Upper Kirkgate, Aberdeen. The frontage of the new buildings will be of granite. Messrs. D. and J. R. M'Millan, architects, of Aberdeen, have prepared the plans for the work.

PROPOSED NEW PARISH COUNCIL BUILDINGS, GALASHIELS, N.B.—At the Galashiels Parish Council on the 3rd inst. sketch plans of the proposed new Parish Council Buildings, prepared by Mr. John Hall, architect, were submitted for consideration. The plans include board-room and office accommodation for the Inspector of Poor, and Registrar, with houses for these officials on the upper stories. The cost of the new buildings was estimated at between 1,400*l.* and 1,500*l.*

NEW RESIDENCE, DUNDEE.—A new private residence is being erected on a site adjoining Bingham-terrace, Dundee, from the plans of Messrs. James Foggie and Son, architects. The contractors for the work are:—Mason, William Bennet; joiner, John Stewart; plumbers, John Crichton and Sons; plasterer, William Dand; slater, Charles Brand; lathing, Slimming and Robertson; painters, P. and A. Davie.

FLOUR MILL, SHEFFIELD.—New flour mills, which have been built for Messrs. Price and Sons, in Millsands, Sheffield, were recently completed and opened. Messrs. Gibbs and Flockton, architects, Sheffield, prepared the plans for the work, and Mr. John Greenwood was the general contractor. The machinery was supplied by Messrs. Briddon and Fowler, flour mill engineers, Manchester.

TOWN HALL, HEREFORD.—The new Town Hall, at Hereford, was opened a few days since by the Mayor (Alderman H. C. Beddoe). The new building, which is situated in St. Peter's-square, at the top of St. Owen-street, has been erected at a cost of 25,000*l.* Mr. H. A. Cheers, of Twickenham, was the architect, and Mr. W. J. Bowers, of Hereford, secured the building contract at 18,450*l.*

THEATRE, POPLAR.—A new theatre is to be erected at the corner of Stainsby-road and East End-road, Poplar. The building has been designed by Messrs. Owen and Ward, of Birmingham, and will be erected under their supervision. The house will provide seating accommodation for 1,844 persons.

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APPOINTMENTS.

UNIVERSITY COLLEGE, UNIVERSITY OF LONDON.—Professor Ernest Gardner has been appointed to represent the College on the Board of Architectural Education, established by the Royal Institute of British Architects; and Professor H. R. Kenwood has been appointed to represent the College at the Folkestone Congress of the Royal Institute of Public Health.

EALING.—There were 110 applicants for the appointment of clerk of works for new schools for the Corporation, and the selection has fallen upon Mr. A. M. Southern, of Watford.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the following appointments:—Chelsea—Mr. R. G. Davis as sanitary inspector, in place of Mr. W. Thorpe, resigned, from June 1. Woolwich—Mr. T. Powell as sanitary inspector, in place of Mr. A. Mackie, resigned, from April 18. Middle Temple—Mr. A. D. Cowburn as medical officer of health, in place of Dr. Waldo, resigned, from May 1. Inner Temple—Mr. A. D. Cowburn as medical officer of health, in place of Dr. Waldo, resigned, from May 1.

FORFAR.—Mr. Alexander Watterston, builder, Dundee, has been appointed Burgh Surveyor of Forfar.

SANITARY AND ENGINEERING NEWS.

WATERWORKS, NEWPORT.—The new waterworks at Newport are now nearing completion. The new works occupy a site nine miles from Newport, in the direction of Chepstow, upon a part of what was formerly Wentwood Forest. The reservoir, practically a natural lake in the hollow of the hills, has a storage capacity of 400,000,000 gallons. It is situated at Llanvaches, in the valley between the Grey Hill and Mynydd Tir Fach, an embankment having been constructed across the valley. The embankment at the base is 536 ft. wide, and gradually slopes, being at the top 30 ft. wide. It has cost over 100,000*l.*, the foundations having been put in to a depth of over 200 ft. The embankment, which is faced with dressed limestone pitching, is joined by wing trenches, which spread into the hillsides, both being formed of concrete and puddled clay; in one case the foundations are carried to a depth of 170 ft., and in the case of the eastern trench to 190 ft. The main dam is 800 ft. long, whilst the combined length of the wings is 750 ft. At the lower end of the reservoir is the valve tower, connected with which are the mains to Newport. The polarite system of mechanical filtration has been adopted. Mr. Conyers Kirby, the then Borough Engineer, was appointed engineer of the works in 1893. The contract was let to Mr. James Young, of Glasgow; but the work was subsequently continued under the supervision of the Waterworks Committee. In 1897 Mr. Baldwin Latham, M.Inst.C.E., became engineer for the scheme, and he has carried it through to completion.

NEW PIER, WESTON-SUPER-MARE.—A portion of the new pier at Weston-super-Mare has been finished and opened. The section of the pier now completed has a uniform width of 50 ft. up to the pavilion, when it broadens out to 300 ft. for a distance of 175 ft. An electric tramway is to run the whole length of the structure. Mr. Dawson is the resident engineer, and the contractors are Messrs. Mayoh and Haley, of London.

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science, held at Leeds, on June 10 and 11, three candidates presented themselves, and one candidate, Mr. Walter Barugh (Barnsley), was awarded a certificate. At an examination in Practical Hygiene for School Teachers, held in Leeds, on June 10 and 11, 1904, eight candidates presented themselves, and three were awarded certificates—viz., Miss E. Clegg (Hebden Bridge); Mr. C. Gedge (Barnsley); and Miss Beatrice Mitton (Barnoldswick).

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. W. B. Whitie, architect (Glasgow), has removed from 196 to 219, St. Vincent-street, Glasgow.

WAR MEMORIAL, BEDFORD.—The unveiling of the war memorial, at Bedford, took place recently. The memorial takes the form of a bronze statue, representing a soldier, which stands upon a pedestal of Portland stone. Messrs. Farmer and Brindley, of London, supplied the monument, and the cost was 1,000*l.*

QUEEN VICTORIA MEMORIAL, NOTTINGHAM.—The model for the Queen Victoria memorial statue, at Nottingham, has been finished. The monument will be of white Carrara marble, and the cost will be about 2,000*l.* Mr. Albert Toft is the sculptor.

DWELLINGS FOR THE WORKING CLASSES, LIVERPOOL.—At the Municipal Offices, on the 9th inst., Colonel A. J. Hepper, R.E., an Inspector of the Local Government Board, held an inquiry into an application by the Liverpool Corporation for a modification of the order of 1902, so as to authorise the demolition, on the first clearance, of an increased number of houses on the Upper Mann-street area, with a view to the erection of an additional number of dwellings for the working classes; and also for sanction to borrow 30,000*l.* for the purchase of land and the erection of dwellings on the area mentioned. Mr. R. D. Cripps, Assistant Corporation Solicitor, explained the nature of the two applications, and said the Corporation were empowered to deal with the Upper Mann-street area in two equal clearances, displacing 400 persons on each clearance, although, as a matter of fact, the total number to be displaced was only 743. It was intended to erect five blocks of dwellings on this area, and it was proposed to build three blocks on the first clearance. This would entail a displacement of 493 persons instead of 400 on a first clearance, but after such clearance they would re-house 288 persons instead of 260, as provided by the order. Then the approval of the Board was required to the purchase of the site of 236, Beaufort-street, to be added to the site comprised in the improvement scheme. The 30,000*l.* asked for was divided as follows:—11,150*l.* for the land, and 18,850*l.* for the buildings. Mr. F. T. Turton, Deputy City Surveyor, gave evidence as to the plans and the scheme in detail, explaining that in the construction of these dwellings there would be a new departure. As the aspect of the site faced towards the river, it was proposed to construct flat roofs, which could be used for playgrounds for the recreation of the tenants, for drying clothes; whilst at the end of each roof a shelter against wet weather would be provided.

QUEEN VICTORIA MEMORIAL, HARWICH.—The Victorian Memorial, at Dovercourt, Harwich, was unveiled on the 11th inst. The memorial consists of a statue, executed in Carrara marble, standing on a base of Cornish granite. The whole monument stands about 14 ft. in height, and the work has been designed and carried out by Messrs. J. Watts and Co., Ltd., Colchester.

HOUSES ADAPTED AS TENEMENTS.—The Public Health Committee of the London County Council reported as follows at Tuesday's meeting of the Council:—On May 10, 1904, we brought under the notice of the Council the report by the medical officer of health and by Dr. Young as to the sanitary accommodation in houses originally built for one family, but now let in separate tenements to several families. One of the many important facts disclosed in that report, was the wholly inadequate arrangements for the supply of water to the tenants of the upper floors in such houses; there being in many, if not most of such houses, but a single water tap, and that in the basement or on the ground floor. The supply of water to inhabited houses is at present regulated by the provisions of sections 2 and 48 of the Public Health (London) Act, 1891. Section 2 provides that the absence from premises of water fittings shall be a nuisance liable to be dealt with summarily under the Act, and section 48 (1) provides that "an occupied house without a proper and sufficient supply of water shall be a nuisance liable to be dealt with summarily under this Act, or, if it is a dwelling-house, shall be deemed unfit for human habitation." The requirements of both these sections appear to be met by the provision of one water tap, so placed as to be available to all tenants living in the house. We are of opinion that there are grave disadvantages in the present inadequate supply of water to the tenants of tenement houses, and we have very carefully considered the subject, with a view to devising some means of remedying what is nothing less than a serious evil. We think that the owners of such houses should be obliged to make reasonable provision for the supply of water to the tenants of each floor, and we would propose that power should be given to the sanitary authorities in London, within their respective districts, to compel the owner of any such house to make such provision. Time has not admitted of our consulting the Metropolitan Borough Councils in this matter. We propose to do so immediately, but in order to comply with the standing orders of the Council, we are anxious to obtain the authority of the Council for such a provision being included in the General Powers Bill of 1905. The Council would have the opportunity when that Bill comes before it of confirming or modifying the proposal which we now submit.

Legal.

ACTION BY ARCHITECTS.

THE case of Coggin and another *v.* the Aldershot Urban District Council came before Mr. Justice Grantham, and a special jury, in the King's Bench Division, on the 15th inst.—an action by the plaintiffs, Messrs. Goggin and Wallis, architects, of 15, York-Buildings, Adelphi, to recover from the defendants fees for work done in connexion with the preparation of plans, taking out quantities, etc., in connexion with the Aldershot School Board. Defendants, in their defence, denied liability, and said the plans had to be done according to the approval of the Board of Education, and such approval had never been given.

Mr. Pickford, K.C., and Mr. J. D. Crawford appeared for the plaintiffs, and Mr. Duke, K.C., and Mr. Cunningham Glen for the defendants.

Mr. Pickford, in opening the plaintiffs' case, said that the School Board for Aldershot were satisfied that his clients were entitled to their money—viz., 2½ per cent. on 14,369*l.* 19s. 10d., but the defendants, although the work had been done, and they had possession of the plans, and kept them, declined to pay, and principally upon these grounds. The defendants admitted that the work was done, and that it was satisfactory; but they said that the School Board was a Corporation under seal, and any contract entered into should be under seal, and that, no contract under seal having been entered into in the present case, there was no liability in law for them to pay.

The learned counsel was proceeding to open the facts of the case, when his lordship suggested that the parties should endeavour to come to terms. He said it was obvious that the plaintiffs must be paid, and, no doubt, if the other authority had not come in and taken over their powers in July of last year, the School Board, who gave the original order, would have paid.

A consultation took place, and Mr. Duke announced that, after his lordship's expression of opinion, defendants had agreed, although they had no resolution of the Council, to submit to a verdict for the plaintiffs for 500*l.*, the amount agreed between counsel.

His lordship expressed approval, and said the defendants had acted with credit and honourably in the matter.

Judgment accordingly.

ACTION BY BUILDER.

THE case of Robins *v.* Goddard came before Mr. Justice Farwell, sitting as an additional Judge of the King's Bench Division, on the 9th inst., an action by the plaintiff, Mr. A. W. Robins, a builder, claiming from the defendant, Mr. T. F. Goddard, 1,055*l.* 17s. 2d. as due to him upon the final certificate of the defendant's architect, pursuant to a building contract, dated October 15, 1902, and made between the plaintiff and the defendant. The defence was that the amounts allowed for work and materials by the certificate were not in accordance with the provisions of the contract, and were excessive, and that the work and materials were not in accordance with the contract, with the result that defendant would have to incur great expense in re-doing much of the work, and in the purchase of proper materials. Defendant accordingly counterclaimed against the plaintiff for damages. The plaintiff replied that the defendant's counterclaim, under the terms of the contract, could not be maintained. The contract provided that the architect, during the progress of the work, had power to order the removal from the works any materials which he was of opinion were not in accordance with the specification, and for the substitution of proper materials. In case of default on the part of the contractor to carry out such order the employer had power to employ other persons to carry out the same, the expenses being recoverable from the contractor. The contract also provided that no certificate of the architect should be considered conclusive evidence as to the sufficiency of any work and materials to which it related, nor should it relieve the contractor from his liability to make good all defects as provided by the agreement. The architect's final certificate was in the following terms:—"I hereby certify that the sum of 1,055*l.* 17s. 2d. may be paid to Mr. A. W. Robins, of 11, High-street, Wanstead, in full settlement of all claims for extras and work under the contract dated October 15, 1902, being balance ascertained to be due after adjustment of accounts."

At the conclusion of the arguments of counsel, his lordship said the action was really undefended. The defendant's counterclaim raised a question as to the construction of the building contract. In such cases the employer

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used the services of an architect for his own protection. The builder could recover nothing except under the architect's certificate, given under Clause 30 of the contract. If all the contract was read together, it was quite plain and reasonable. The effect was that the architect was made a referee as between the parties to the contract. The defendant now asked the court or a referee to decide as to alleged defective materials and workmanship. That was provided for by Clause 17, and unless the architect expressed an opinion unfavourable to the contractor, there was nothing for the court to decide. Therefore, there was no case on the counterclaim, and there must be judgment for the plaintiff for the amount claimed, with costs.

A stay of execution was granted on the usual terms, with the view to an appeal.

Mr. Duke, K.C., and Mr. Beddall appeared for the plaintiff; and Mr. C. B. Marriott for the defendant.

ACTION BY PAVING CONTRACTORS.

THE case of the Sanitary Block and Tile Pavement Company, Ltd., *v.* Lee and Sons came before Mr. Justice Channell in the King's Bench Division on the 7th inst.

In this case the plaintiffs claimed damages against the defendants for alleged breach of contract.

The statement of claim alleged that the plaintiffs were paving contractors at Westminster, and the defendants timber merchants and manufacturers of wood-paving blocks. In or about May, 1903, the plaintiffs entered into a contract with the Corporation of Westminster to carry out certain wood-paving work in accordance with a certain specification. Plaintiffs alleged that the defendants were aware of the contract, and of the terms of the specification, and for the purpose of enabling the plaintiffs to carry out the work, defendants agreed to supply them with about 300,000 creosoted, yellow-deal paving-blocks. The contract, plaintiffs said, was contained in letters which had passed between them and the defendants between May and June, 1903, and that defendants agreed to supply yellow-deal blocks suitable for use by plaintiffs in carrying out their paving work in accordance with the terms of the specification, and, in particular, agreed that the timber from which such blocks were sawn should be the "best of its respective kind, of even grain, well seasoned, and free from sap." Plaintiffs said that the defendants warranted that the goods should be reasonably fit for the purpose for which they were required, and that, in consequence of their not so supplying them, plaintiffs were obliged to purchase same elsewhere at an increased price. Hence the claim for damages. The defence was a general traverse of the plaintiffs' allegations.

Mr. Lush, K.C., and Mr. Batten appeared for the plaintiffs, and Mr. Scrutton, K.C., and Mr. Clay for the defendants.

In the result his lordship, after hearing the evidence and the addresses of counsel, gave judgment for the plaintiffs for 102*l.* 10s., and costs.

A stay of execution was granted with the view to an appeal on defendants bringing the damages into court, and paying the plaintiffs' solicitor's costs on the usual undertaking.

NEWCASTLE LIGHT CASE.

IN the Chancery Division on the 9th, 10th and 14th insts., Mr. Justice Buckley had before him the action of Cowper and Steel Coulson and Co., Ltd., *v.* Milburn and others.

In this case the plaintiffs claimed an injunction to restrain defendants, their servants, and agents from continuing the erection of certain buildings so as to cause a nuisance or obstruction of the ancient lights of the plaintiffs' premises, as the same were enjoyed previous to the removal of the buildings formerly standing on the site of the defendants' premises.

Mr. Astbury, K.C., and Mr. Maughan appeared for the plaintiffs, and Mr. Buckmaster, K.C., and Mr. O'Leigh Clare for the defendants.

Mr. Astbury, in opening the case, said that the plaintiff, Cowper, was the freeholder, and the plaintiff Company the lessees of Dean Inn, which was No. 20, Dean-street, Newcastle-on-Tyne. Until recently, on the west side of Dean-street, there were certain buildings of moderate height, and they had been acquired by the defendants and pulled down, and on the site the defendants had commenced to erect buildings of great size far exceeding the height of the old buildings. After explaining to his lordship the position of the buildings on the model, the learned counsel said that the defendants disputed the plaintiffs' title in the defence. He asked if they would admit the plaintiffs' title.

Mr. Buckmaster said he wanted to see the plaintiff in the box.

Mr. Astbury said he would be called. He said that in June, 1903, defendants began to build, and in December, 1903, plaintiff first became aware that the defendants intended building higher than the old building, and he thereupon instructed his surveyor to go and examine the defendants' plans. On December 14, 1903, defendants' solicitors, in answer to complaints from plaintiffs, denied that they were under any liability, and on December 16 the writ in the action was issued.

The plaintiff, Mr. Joseph Cowper, was called, and stated that on December 16 defendants' buildings were below the height of the old buildings. Defendants' buildings had already affected the light of Dean Inn. People on the ground floor and first floor had to burn gas nearly all day, and the light on the next two floors was affected. The new buildings simply destroyed his premises as licensed buildings. They could not get anyone to go into the place, as they had to burn gas.

His lordship: Do you say that people will not drink beer because of the gas?

The plaintiff: They generally like a light place, and the place is not so light and comfortable as before.

Cross-examined,

He had been speculating in property in Newcastle for many years. In the course of his experience he had brought a few actions to restrain people building. Asked about some property he sold to Messrs. Milburn, witness admitted it was bounded on each side by property they had already bought. During the last few years the whole character of Dean-street had been slowly changing. Witness admitted that in the vicinity of his property several new and high buildings had been erected. Plaintiff admitted that on the east side of Dean-street and north of Dean Inn there was a big building put up by the Prudential Company. The result of the change in the character of Dean-street was that the value of property had gone up considerably in value; but the value of property all over Newcastle had gone up during the last few years. He knew in the early part of 1902 that it was the intention of the defendants to build upon the site they had acquired in Dean-street, and that the site extended southward from the Manchester Fire Insurance building, of which he was a manager, to the bottom of the street. He knew that the defendants would build so as to interfere with the light. He thought the new buildings would be very little higher than those that stood there before. He never suggested to anybody that, judging from the height of the crane, the defendants must be going to put up a "Tower of Babel." He was not in actual occupation of any part of Dean Inn. His interest was in the rents received from the tenants. The light on the ground floor was of vital importance to the tenants in carrying on their trade. His chief ground of complaint was that the new building would depreciate the value of the property in the future. He bought the place for future development.

Mr. Buckmaster: Do I understand that on some future date you intend to rebuild or reconstruct these premises?—Yes, I did; but not now.

It is quite hopeless?—Yes.

Further cross-examined, plaintiff admitted that, before he brought the action, Steel, Coulson, and Co. had not complained about the light. It was not true that Steel, Coulson, and Co. refused to come in as parties unless he indemnified them.

Mr. John Lamb, an architect and surveyor, of Newcastle, said that he knew the premises in question, and, in his opinion, the new buildings would seriously damage the letting and selling value of the Dean Inn property. He said the ground floor of the plaintiffs' building, under the old style, was worth 90*l.* a year; but, under the new conditions, it would only be worth 50*l.* He capitalised that at 1,000*l.*, being twenty-five years' purchase; but, on account of some advantage to be got in the upper floors, he reduced the loss to 900*l.* In his opinion, owing to the darkening of the building, there was a great risk of the license being lost.

Cross-examined,

The part most affected was the back of the ground floor, and that would most seriously affect the value.

Mr. James Macmickle, tenant of the Dean Inn for the last five years, said that when the old buildings stood he had to light one gas jet on a dull day; but now he had to light three. He had to light up at least an hour and a half earlier each day than before the defendants' building was put up. The use of gas interfered with the business very much, and the takings were less.

Mr. P. Smith, manager to Steel, Coulson, and Co., said that his firm had about thirty houses in Newcastle. Owing to the depreciation in the light of the house, the profit on the bar was 1*l.* a week less. He had no desire to renew the lease now. The character of Dean-street had altered very much, and was no longer suitable for a working-class beer-house.

Further examined, Mr. Smith said he calculated the loss roughly at 1,000*l.* The value of the Dean Inn, as a beer-house, was gone; but he thought the building could well be used as a restaurant. They would have to cater for a different class of people. By the darkening of the premises the chances were they would not get a full license for the premises.

Cross-examined by Mr. Buckmaster,

If the light was not interfered with, the Dean Inn, as a beer-house, might just make ends meet.

Your idea about the light is that it is the last straw on the camel's back?—Yes; but it is a pretty heavy one.

Mr. Arthur Stockwell, architect and surveyor, of Newcastle, said he prepared the plans for the alterations made at the Dean Inn in 1877, which were carried out at a cost of 400*l.* He agreed with Mr. Lamb that the depreciation in the value of the house was about 900*l.*

Mr. James Scott, an architect, of Newcastle, said he had known Dean-street for many years, including the buildings pulled down by the defendants. The effect of the new buildings would be to materially injure the plaintiffs' premises, and make them substantially inconvenient.

Mr. Chas. Dixon, clerk of the works, who inspected the defendants' premises on Mr. Cowper's instructions, gave evidence in support of the plaintiffs' case.

Cross-examined,

Between December and January defendants used great expedition in putting up their building. He did not suggest that they put on more men, but they concentrated their men on one part. The substitution of fine business premises, such as defendants were building in place of very old buildings, ought to improve Dean-street.

Mr. Joseph Potts, architect and surveyor, of Newcastle, examined, said he had considerable experience in valuing property in Newcastle for light obstruction. He said that property in Dean-street has been steadily rising in value for some years. He was of opinion that plaintiffs' property could be put to very much greater advantage than carrying on an inn. He had not the slightest doubt that the buildings of the defendants had depreciated the value of the plaintiffs' property, and, if they were carried higher, the depreciation would be more. A fair value of the Dean Inn, as it stood to-day, was 3,500*l.*, and the damage it would suffer from the defendants' new building he estimated at 1,000*l.*

Cross-examined,

During the last few years, the west side of Dean-street had been practically rebuilt. It was the improvements in the quay that had led to the enhanced value of the property in Dean-street.

This being the plaintiffs' case, Mr. Buckmaster proceeded to call evidence for the defendants.

Mr. David Oswald, an architect, of Newcastle, said that Dean-street had been constructed about ninety years, and, until the last few years, consisted of old property. He inspected the plaintiffs' premises on January 6 and 7, before the defendants' old buildings were pulled down, and the furthest that a ray of light could penetrate on the ground floor was 15 ft. In the event of the defendants' buildings being put up to their full height the rays of light would penetrate 9 ft. Having regard to all the circumstances, he did not consider that the new buildings of the defendants would seriously interfere with the comfort and enjoyment of the plaintiffs' premises. He thought that the plaintiffs' premises would increase in value if the defendants' buildings were put up in accordance with the present plans.

Cross-examined,

He had not been on the plaintiffs' premises since January 7, and the defendants' building had been increased in height 13 ft. since that date, and that would make some depreciation in the amount of the light.

Mr. William George Law, C.E., Borough Surveyor and Valuer to the Newcastle Corporation, said he had examined the Dean Inn and the plans of the defendants' new buildings. Defendants' buildings would not interfere with the enjoyment of the plaintiffs' premises. The new buildings would rather increase the value of the plaintiffs' property. Dean-street was a wide street of Newcastle.

Mr. H. S. Clark, Mr. B. F. Simpson, architects and surveyors, and Mr. Robert Mack, an auctioneer and valuer, also gave evidence on behalf of the defendants.

Mr. Buckmaster then addressed his lordship on behalf of the defendants.

His lordship, in giving judgment, said the street opposite the plaintiffs' premises was 57 ft. wide, and plaintiffs' premises had

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windows on the ground, first, second, and third floors. The action was commenced on December 16, 1903, claiming an injunction to restrain the defendants from erecting certain buildings opposite, so as to darken, injure, or obstruct any of their lights in the four floors. On May 2, this year, the House of Lords gave judgment in the case of the "Home and Colonial Stores *v.* Colls," and, on May 18, the statement of claim was amended by striking out any claim with respect to the windows on the second and third floors, and in doing so, plaintiffs were well advised. Relief was now asked in respect of the ground and first floors. Dean-street, which was a street of some importance, had undergone considerable improvement. Defendants had purchased a very large block of land lying on the western side of Dean-street, and were erecting upon that site a large and important block of buildings. During the last few years the character of the buildings in Dean-street had considerably improved, and defendants' buildings were a further development of the street. Suppose the defendants were building so as to create an actionable nuisance to the plaintiffs' light, with the consequential right in damages, but by the character of their buildings so improved the neighbourhood as that the plaintiffs' premises would be appreciated by that state of things, so that the act of the defendants, on the whole, would do no harm, but good, could plaintiffs be said to have suffered no depreciation from the appreciation of the neighbourhood? His lordship thought not. If he found that there was an actionable nuisance, then plaintiffs were entitled to damages for that nuisance, and it was no answer for the defendants to say:—"We, by our act, have improved your property for other reasons." In this case he, therefore, disregarded altogether the question of any improvement of the neighbourhood by the defendants. The question to be decided was, whether the defendants' buildings so obstructed the light given by the plaintiffs' windows as that plaintiffs were thereby deprived of sufficient light, according to the ordinary notions of mankind, and having regard to the neighbourhood in which the plaintiffs' premises were situated. Dealing with the evidence of the surveyors on both sides, his lordship said that, with regret, he must say that the plaintiffs' evidence had been exaggerated. The evidence of the defendants was that, according to the ordinary notions of mankind, there was no alteration of light so as to affect the plaintiffs' premises. With regard to the amount of diffused light on the first floor, and the situation of the surrounding premises, although they had sustained some loss of light, they had not sustained any such loss as to give rise to a claim which was actionable. Dealing with the ground floor windows, his lordship said that in 1897 large alterations to the Dean Inn were made, including a passage-way leading to the upper rooms of the house. Fifty per cent. of the ancient light had thus been obscured. Proceding, his lordship said he did not think there was any nuisance on the part of the defendants. There might be inconvenience, but residents in towns had to put up with a great many inconveniences. The ground on which he really decided the question as to the ground floor windows was that the plaintiffs' premises had been so altered as that obscuration, if there had been any of which complaint could be made, was not due to the defendants' act, but to the conjoint act of the defendants and the plaintiffs. That being so, the action failed, and would be dismissed, with costs.

Mr. Buckmaster applied for an inquiry as to damages. He said the defendants had been restrained from building for some time, and had thereby suffered damage.

After some argument, his lordship refused the application, on the ground that the reason the case was not tried earlier was because the parties had waited for the decision of the House of Lords in the case of the "Home and Colonial Stores *v.* Colls."

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

9,120 of 1903.—J. N. FERGUSON: *Means for Protecting Windows and like Openings.*

A protection for window and like openings, consisting of a screen comprising slidable sections, interlocking means between the sections to limit their vertical movement in each direction, and other interlocking means between the sections upon opposite sides thereof to direct them in their sliding movements and to prevent lateral displacement at any point in the range of movement, both of the aforementioned locking means located upon the said sections.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

10,853 of 1903.—A. BARRACLOUGH and A. CROWTHER: *Closet Flushing Cisterns.*

This invention relates to cisterns for flushing water-closets and the like, and consists in means for supporting the ball tap which supplies water to the cistern and the weighted lever which operates the syphon or other flushing device. According to this invention the ball valve, instead of passing through the wall of the cistern, is supported by a bar or bracket, preferably cast in one piece, with a bracket which supports the weighted lever, forming a substitute for the ordinary crossbar. By this means it is claimed that the ball valve can be more firmly secured, and is more accessible for repairs.

13,152 of 1903.—W. PEEL: *Construction of Gates and hinges therefor.*

This consists in the combination in a gate of horizontal pairs of rails, diagonal struts formed with notches at their opposite edges, and pegs, wedges, or the like, introduced or driven between said notches and the crossing corners of the said horizontal rails and tie bars on heel post of the gate respectively.

13,244 of 1903.—D. J. MICHAEL: *Safety Suspending Grip for Lifts, Skips, and the like.*

This relates to a safety catch for a cage consisting of a box having inclines opposite one another, rollers working on the inclines so that the part to be gripped passes between the rollers and is connected upon opposite side, and a flexible connexion to the suspension rope holding the grips out of action.

15,466 of 1903.—J. GREEN and W. GREEN and CO., LTD.: *Cooking Ranges or the like.*

A cooking range, or the like, consisting in the combination with an oven having flues for heating it with a common exit at the bottom of a passage formed of channel iron or the like secured to the back of the range leading in an oblique or curved direction from the exit to the central chimney or flue, and connecting with the latter in such a position that this outlet will be accessible from the front for cleaning and like purposes when the hood is open.

15,540 of 1903.—L. LISTER and F. LISTER: *Certain Casement Windows.*

This invention relates particularly to that class of casement windows in which the casement or window frame is hung by double-knuckled hinges so that it can be opened either inwardly or outwardly. In this casement, weather-bars or tongues are employed along the top, bottom, and sides of the casement, which project into grooves in the outer frame formed for their reception. In order that the casement can be opened, the weather-bars are made along the top and bottom and the free or opening side of the casement so that they can be withdrawn or made to recede into the body of the casement frame. For this purpose such bars are made with inclined slots, through which fixed pins are passed, so that when the bars are moved longitudinally the inclination of the slots causes them to also move inwards or outwards. Or the pins may be fixed to the bars and their ends engage inclined slots formed in metal fittings secured to the casement. The vertical bar on the free side of the casement may be made in two pieces, the lower end of the upper half being made to slide over the upper end of the lower half. To cause the bar to recede, links are provided to draw the two halves towards each other. The upper end of the upper half and the lower end of the lower half are respectively arranged to engage the top and bottom weather-bars, and move them so that they all recede together. The links may be moved by levers operated by a cam on a spindle provided with an operating handle. Or they may be moved by an eccentric, or eccentrics, on the spindle. Springs are provided to move the bars outwards. In small windows, the vertical bar may be made in one piece, and be moved bodily inwards by a cam or eccentric.

15,714 of 1903.—G. AINLEY: *Window Holders for Sliding Sashes.*

On the meeting-rail of the bottom sash a metal casing is fixed, the underside of which is suitably grooved to allow the free working of a sliding bar. On the upper surface of the said metal casing is a T-shaped slot communicating with the groove on the underside. The sliding bar is provided with a projection of convenient form, which passes through and above the T-shaped slot in the metal casing, this projection is used as a handle for actuating the sliding bar. The projection may be turned from a vertical to a horizontal position on being pushed forward to the end of the T-shaped slot, thus preventing the bar from accidentally working back from its forward position. On the style of the top sash a metal plate is fixed, containing a series of suitably-shaped holes to receive the end of the sliding bar, by means of which the sashes can be securely fixed in a variety of positions.

15,769 of 1903.—L. A. DE MAYO: *An Adjustable Door Hook or Catch.*

The apparatus comprises a keeper and a latch, the keeper being formed of a base plate and an outwardly projecting lug, which projects diagonally from the face of the door. The lug has two openings arranged at different distances from the base plate, and terminates in a vertical notched head. The latch is formed of two parallel members spaced apart so as to leave a longitudinal opening or slot in the arm, and connected at their outer ends by a cross-piece, from which a hook projects. Notches are formed at the inner ends of said members, said notches lying opposite each other to form an enlarged portion at the inner end of the opening in the arm. The upper member of the arm has a series of lugs, which are spaced equidistant from each other and lie in the opening in the arm. The members are connected at their inner ends by a pin which extends between them and is arranged to turn loosely in a box or thimble, which is placed between the members of the arm and carries a stud which is arranged to turn freely in a plate fastened by screws, or otherwise, to the frame of the door. The plate has at one side of the thimble a stop, which is preferably formed integral with the plate.

16,001 of 1903.—P. T. SHIELDS: *Fire and Sound-Proof Floors.*

A fire and sound-proof floor, comprising anchors adapted to be built into the walls of a building and provided with upturned ends to resist outward strain, and projecting into a recess formed in the inner face of the wall, tie rods having one end hooked or looped on to the parts of the anchors which project into the recess in the wall, and their other ends similarly attached to a bar resting upon a support between the outer walls, or to similar anchors in an opposite outer wall, the parts of the tie rods which are intermediate, their ends bent downwardly; cement or concrete arranged between, above, and below the tie rods and extending into the aforesaid recesses in the walls, wood strips partly embedded in the upper surface of the cement or concrete, and floor boards nailed to said strips, with an air space between said boards and cement or concrete.

16,056 of 1903.—J. SEPHTON: *Ventilators.*

A ventilator for ventilating rooms or spaces, comprising a chamber, having a branch or branches through which the air to be introduced passes to the interior of the room, and a slide or slides, or damper or dampers, adapted to slide and open or close wholly or partially the said branch or branches.

16,301 of 1903.—A. M. LAMBERT: *Building Blocks or Slabs.*

This invention relates to blocks or slabs for use in building up partition walls and the like, and refers more particularly to the form and shape of the groove with which each side or end of the slab is traversed. The slabs are made of rectangular or diamond shape, although they may be of any regular or irregular geometrical form. The sides of these slabs or blocks are formed with a groove of oval form extending from corner to corner of the slab, leaving a narrowed surface at each side of the groove. These grooves in elevation are not made straight, but are arched from corner to corner, the curve being deepest preferably in the centre, so that, when slabs or blocks are put together with cement or grouting in the groove, there is a greater amount of cement or grouting in the centre of the block than towards the edges, and, when set, a thin partition wall constructed in this manner is claimed to be stronger than the ordinary method of construction.

28,626 of 1903.—G. MILLS: *A Deflector or Distributor for Automatic Fire Extinguishing Sprinklers.*

This deflector or distributor consists of a concavo convex disc of brass or other suitable metal, round the edges of which are formed any suitable number of specially-shaped apertures. In practice, it has been found that four of these apertures give the best result, but no limitation is made as to number. These apertures are of the largest diameter in the concavo-convex sides of the deflector, and are contracted slightly at the mouth or top, opposite which they terminate in slots or nicks towards the centre. The deflector is mounted opposite the valve orifice, and supported by arms or equivalent forming part of the sprinkler body, and in such a case and with four apertures in the deflector a very uniform and effective distribution of water is obtained, whether the latter is discharged upwards towards the ceiling or downwards towards the floor of the building in which the sprinklers are installed.

663 of 1904.—A. S. CORONEL: *Window Furniture for Holding and Suspending Sliding Sashes.*

Window furniture for holding and suspending sliding sashes, consisting of a track or rail in each sash channel and in the sash stiles, wheels adapted to run on said track, and to

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be forced thereon by springs so as to firmly hold said sash in any desired position, and at the same time allow it to be easily moved along the sash channels.

5,382 of 1904.—B. KITTLER: *Machines for Manufacturing Bricks, Briquettes, and the like.*

A machine for manufacturing bricks, consisting in the combination of a mould wheel formed with moulds in the peripheral face thereof, a device for filling the moulds, and a second wheel provided with plungers for discharging the bricks from the moulds.

7,393 of 1904.—O. FORSTER: *Construction of Hollow Building Blocks, Bricks, Stones, Walls, Floors, Ceilings, and Beams, and the Fixing of Dowels and the like therein.*

A hollow brick or stone having a break away stay-piece provided at its junctions with the body of the brick with inner and outer grooves for facilitating the shearing of the same, in which the inner grooves are arranged between the outer grooves and the body of the brick, and the inner and outer grooves extend into the stay-piece to the same plane or overlap each other.

8,220 of 1904.—M. COSSEY: *Means for Hanging or Supporting Sliding Doors, and the like.*

This consists in the combination of two outside bars, of an intermediate bar, said outside bars and intermediate bar being movable relatively to each other, movable anti-friction devices arranged on both sides of said intermediate bar and between it and the outside bars, carriers for said anti-friction devices, adapted to retain said anti-friction devices on both sides of the intermediate bar in position relatively to each other, and means for preventing said carriers from moving beyond predetermined points.

8,896 of 1904.—H. LEBUS and S. LEBUS: *Drawers for Tables, Desks, Wardrobes, and other Articles of Furniture.*

This invention relates to drawers for tables, desks, wardrobes, and other articles of furniture. In such wooden drawers as heretofore made, the sides are composed of plain lengths of wood which, as is well-known, frequently warp and shrink and cause the drawer to stick in its guides. The object of this invention is to provide means whereby the above described disadvantage can be obviated, and to this end, instead of making the drawer sides in the usual way, they are made in the form of panels secured in frames, which may be of any suitable construction.

8,966 of 1904.—S. H. JACOBSON: *Ventilators.*

This consists in the combination with a ventilating pipe or conduit, of a rotary cowl comprising a hollow transversely extending body having an opening in the bottom wall thereof, a neck or tube secured to said body, extending through said opening and surrounding said pipe or conduit, bearing plates located at the common centre of said neck and pipe, by means of which said cowl is supported from and mounted to turn on said pipe, angularly arranged arms leading upwardly from the upper of said plates and connecting the same with said neck, angularly arranged arms leading downwardly from the lower of said plates and connecting the same with said pipe and a valve in the body of said cowl forming a contracted passage therethrough and serving to cut off said opening from the direct current of air.

9,025 of 1904.—F. SHUMAN: *Forming Piles of Concrete or Cement.*

A method of forming concrete or cement piles, which consists in providing a hollow pile, sinking said pile into the ground to form a hole and then slowly or intermittently withdrawing the said pile and filling the hole with concrete or cement during such withdrawal, and then permitting the said concrete or cement to set.

13,586 of 1903.—F. SHARP: *House Gullies.*

According to this invention, a compact, self-contained, reversible or adjustible gully top is obtained without any projecting inlets. For this purpose, rebated openings are formed in the side walls of the gully top, and, in lieu of the usual grating occupying the whole upper area of the gully top, part of such area is covered over, and the cover is provided with rebated openings, thereby making that part available as a connexion or seating for vertical drains to discharge beneath the grating.

13,678 of 1903.—A. GRAY: *Drying Timber.*

A process of drying, consisting in first heating the material in a closed chamber to a uniform temperature throughout, or nearly so, then reducing the pressure in the chamber and removing the moisture thereby vaporised, until the material is so reduced in temperature throughout its substance that the moisture evaporates slowly, and afterwards admitting air or vapour, or both, into the chamber, and then again closing the chamber and repeating the above cycle of operations.

21,947 of 1903.—C. HOCKE: *Manufacture of Portland Cement.*

A process for utilising low-grade fuel in the manufacture of cement, in which slack coal or powdered coal is added to the mixture of which the cement is manufactured, the mixture being pressed into the shape of bricks, which, after the burning process, will have been reduced to completely calcined cement clinker, rendered very porous by the distillation of the fuel.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

June 2.—By MADDISON, MILES, & MADDISON (at Yarmouth).

Yarmouth, Norfolk.—20, Audley-st., u.t. 38 yrs., g.r. 1*l.* 2s., q.r. 15*l.* £210
38, Middle Market-rd., f., y.r. 18*l.* 360
19 and 20, South Market-rd., f., y.r. 21*l.* 1s. 320
5, St. James's-passage, f., w.r. 9*l.* 2s. 130
42, Dene-side, f., y.r. 10*l.* 8s. 140
22 Row 99, and 15 Row 101, King-st., f., y.r. 17*l.* 5s. 178
Gorleston, Suffolk.—36 and 37, Lower Cliff-rd. (s.), f., y.r. 20*l.* 265

By SALTER, SIMPSON, & SONS (at Stowmarket).

Wickham Skeith, Suffolk.—"Wickham Hall Estate," 131 a. 3 r. 21 p., f., p. 3,000
Enclosure of land, 11 a. 3 r. 8 p., f. 170
Impropriate rent-charge of 60*l.* 18s. 6d. 820
Wilby, Suffolk.—"Rookery Farm," 194 a. 2 r. 13 p., f., y.r. 145*l.* 1,475
Stoke Ash, etc., Suffolk.—"Coulsey Wood Farm," 75 a. 0 r. 5 p., f. and c., y.r. 50*l.* .. 675

By J. CUMBERLAND & SONS (at Ampthill).

Sheppingley, etc., Beds.—"Froghall Farm," 94 a. 0 r. 31 p., f. 3,450
Freehold bungalow residence and 2 a. 2 r. 0 p., p. 280

June 3.—By T. W. GAZE & SON (at Diss).

Langmere, Norfolk.—A freehold farm, 193 a. 3 r. 18 p. 2,225
Burston, Norfolk.—A freehold and copyhold farm, 39 a. 0 r. 12 p. 400
Two enclosures of pasture, 4 a. 0 r. 27 p., c. 105

By W. INGRAM SELWYN (at Reigate).

Brockham, Surrey.—Gadbrook-la., a freehold cottage and 0 a. 0 r. 31 p., y.r. 10*l.* 8s.; Home-la., a copyhold cottage and 0 a. 0 r. 27 p., w.r. 13*l.* 188

By MACQUIRE & MERRY (at Kettering).

Broughton, Northants.—Pytchley-rd., "Sunnyside" and "West View," f., y.r. 54*l.* 775
Northampton-rd., three residences and garden plot, f. 1,055
Northampton-rd., 32 freehold cottages 1,710

June 4.—By SALTER, SIMPSON, & SONS (at Norwich).

Southwood, Norfolk.—Two freehold grazing marshes, 26 a. 0 r. 17 p., y.r. 41*l.* 10s. .. 570

June 6.—By DAVID J. CHATTELL.

Bermondsey.—80, 103 to 129 (odd), Alscot-rd., u.t. 25 yrs., g.r. 65*l.*, q.r. 415*l.* 3,280
Pimlico.—19, St. Leonard-st., u.t. 19½ yrs., g.r. 4*l.*, y.r. 36*l.* 225
Stoke Newington.—53, Harcombe-rd., u.t. 60 yrs., g.r. 5*l.*, y.r. 30*l.* 290

By HEAPS, SON, & REEVE.

Pimlico.—96, Warwick-st., u.t. 20½ yrs., g.r. 10*l.*, e.r. 70*l.* 355
Hampstead.—2, 4, 10, and 12, Lowfield-rd., f., w.r. 235*l.* 14s. 1,805
Kilburn.—17, Salusbury-rd., u.t. 58½ yrs., g.r. 7*l.* 10s., w.r. 65*l.* 300
1a, 3a, 13, and 15, Albert-rd., u.t. 55½ yrs., g.r. 21*l.*, w.r. 176*l.* 16s. 880
62, Albert-rd., u.t. 58½ yrs., g.r. 5*l.* 5s., w.r. 46*l.* 16s 245
1 to 4, Alpha-pl. west, u.t. 53½ yrs., g.r. 18*l.*, w.r. 131*l.* 6s. 490
21, Bridge-st., u.t. 54½ yrs., g.r. 5*l.*, w.r. 31*l.* 4s. 130
8, 9, and 12, Abbey-la., u.t. 14½ yrs., g.r. 30*l.*, w.r. 98*l.* 16s. 120
114 and 116, Albert-rd., u.t. 58½ yrs., g.r. 12*l.*, w.r. 115*l.* 14s. 485
43, Cambridge-av., u.t. 54½ yrs., g.r. 10*l.*, e.r. 55*l.* 465

By WM. HOUGHTON.

Walthamstow.—St. Mary's-rd., a freehold building site 325
Westbury-rd., a freehold corner building site 135
2, Grosvenor Park-rd. (s.), f., p. 810
37, Selborne-rd., with factory premises, yard, etc., adjoining, u.t. 75 yrs., g.r. 9*l.* 10s., w.r. 127*l.* 12s. 850

By KEMSLEYS'.

Forest Gate.—22, Hampton-rd., u.t. 72 yrs., g.r. 7*l.* 7s., e.r. 38*l.* 325
Buckhurst Hill.—Epping New-rd., "The Limes," f., y.r. 40*l.* 750

By LONG & SONS.

City of London.—5, St. Bride-st. ("Yexley's Restaurant"), u.t. 48½ yrs., g.r. 150*l.*, y.r. 600*l.* 5,000
Brentford, Middlesex.—High-st., copyhold premises, lately "The Marquis of Granby," p.-h., p. 590

By EDWARD MILLARD.

Brixton.—Sudbourne-rd., eight blocks of building land, let on lease for 99 yrs., at per annum 441

By E. PENNINGTON.

Twickenham.—Riverside-rd., freehold building land, area 22,730 ft., p. 1,200

By THOMAS, PEYER, & MILES.

Kimpton, Herts.—"The Lion Brewery," f. .. 2,000

By J. CUMBERLAND & SONS (at Luton).

Luton, Beds.—17 and 19, Belmont-rd., f., y.r. 41*l.* 12s. 580
Luton, Beds.—40, George-st., f., p. £1,575
Park-st., freehold house and premises, also two plots of land adjoining 510
91 to 105 (odd), Cambridge-st., f., w.r. 130*l.* 1,640
Toddington, Beds.—Duck-la., "The Toddington Gas Works," f. (as a going concern).. 575

By CHADWICK & SONS.

Long Acre.—17, Queen-st. (s.), f., w.r. 263*l.* 18s. 1,200

June 7.—By T. C. COX.

Twickenham, Middlesex.—Colne-rd., "The Wheatsheaf Brewery," u.t. 55 yrs., y.r. 120*l.*, with goodwill, also copyhold cottage and land adjoining 4,000

By DEBENHAM, TEWSON, & CO.

East Barnet, Herts.—East Barnet-rd., a portion of the "Manor Pk. Estate," 14 a. 3 r. 35 p., f. 7,150

By MANSELL & ROWE.

Norwood—9 and 11, Crescent-rd., u.t. 70 yrs., g.r. 29*l.*, y.r. 155*l.* 1,125

By F. G. WHEATLEY & SON.

Camberwell.—Daneville-rd., f.g. rents 86*l.* 10s., reversion in 58½ yrs. 2,325
Cuthill-rd., f.g. rents 45*l.* 10s., reversion in 58½ yrs. 1,220
Brondesbury.—Burton-rd., f.g. rents 130*l.*, reversion in 81 yrs. 3,505
Branksome, Dorset.—Lake-rd., l.g. rents 55*l.* 14s. 6d., u.t. 81 yrs., g.r. nil 1,015

By BREADMORE & WEBB (at Richmond).

Richmond, Surrey.—Kew-rd., "The Station Hotel," etc., f.g. rents, 221*l.*, reversion in 72 yrs. 6,375
164 and 166, Kew-rd., with Nursery Grounds adjoining, area 2 a. 0 r. 5 p., u.t. 39½ yrs., g.r. 60*l.* 4s. 6d., y.r. 198*l.* 1,410

By D. SMITH, SON, & OAKLEY, with WORSFOLD & HAYWARD (at Ashford).

Saltwood, Kent.—"The Grove," etc., enclosures 2 a. 2 r. 36 p., f. 340
"Redbrooks," and 5 a. 0 r. 16 p., f. 650
Freehold Cottage, and 0 a. 2 r. 20 p. 340
Three freehold enclosures, 7 a. 3 r. 8 p. 1,450
Slaybrooke Farmhouse, homestead and 0 a. 2 r. 34 p., f. 700
Enclosure of land, 5 a. 1 r. 10 p., f. 800
Hythe, Kent.—Freehold pasture land, 13 a. 2 r. 1 p. 390
Eastbridge, Kent.—Freehold marsh land, 14 a. 3 r. 33 p. 550

By TOMPKINS & CAPPER (at Abergavenny).

Abergavenny, Monmouth.—Chapel-rd., "Rock Villa," u.t. 966 yrs., g.r. 2*l.* 10s., p. 615
Lansdowne-rd., corner building site, area 1 acre, f. 205

By J. & S. MOTION (at Mason's Hall Tavern).

Holloway.—Landseer-rd., "The Cottenham Arms," p.h., u.t. 23½ yrs., y.r. 100*l.*, with Goodwill 3,900

By W. BROWN & CO. (at Great Missenden).

Prestwood, Bucks.—"Pankridge Farm," 9 a. 2 r. 0 p., u.t. 137 yrs., g.r. nil 1,200
Enclosure of grass land, 7 a. 0 r. 28 p., part f., and part u.t. 137 yrs., g.r. nil 375

JUNE 8.—By FOSTER & CRANFIELD.

Holloway.—Harvist-rd., "Tenby Villa," with stable, u.t. 38½ yrs., g.r. 6*l.*, e.r. 84*l.* 18s. 510
Barnsbury.—82, Westbourne-rd., u.t. 54 yrs., g.r. 6*l.* 10s., y.r. 40*l.* 260
Notting Hill.—34 and 36, Holland Park-av., and 17, Ladbroke Terrace Mews, u.t. 18½ yrs., g.r. 18*l.* 18s., y.r. 180*l.* 1,380

By HOLCOMBE, BETTS, & WEST.

South Kensington.—9, Selwood-pl., f. y.r. 46*l.* 850
Islington.—58, Gibson-sq., y.r. 50*l.*, also l.g.r. 9*l.*, u.t. 23 yrs., g.r. 18*l.* 355
De Beauvoir Town.—4, Balmes-rd., u.t. 22 yrs., g.r. 4*l.* 10s., y.r. 36*l.* 195
Hackney.—41, Amhurst-rd., f., y.r. 45*l.* 660

By HUMBERT & FLINT.

Elstree, Herts.—Freehold building estate, 4 a. 0 r. 24 p. 800

F. JOLLY & JAMES.

Clapton.—38, Pembury-rd., u.t. 38½ yrs., g.r. 10*l.*, p. 740
14, Gaulton-rd., f., e.r. 65*l.* 900

By FIELD & BLADES.

Norbiton, Surrey.—Asylum-rd., f.g. rents 30*l.* 18s., reversion in 56 and 76 yrs. 625
Streatham.—Ellora-rd., f.g.r. 9*l.*, reversion in 66 yrs. 195
Notting Hill.—Manchester-rd., f.g.r. 27*l.*, reversion in 59 yrs. 400
Hackney-road.—26 to 29, Arline-st., 1 to 10, Chapel-st., and 13, Chapel-pl., f., w.r. 451*l.* 2s. 4,165
14, Hassard-st., f., w.r. 39*l.* 600
Dalston.—Greenwood-rd., l.g. rents 143*l.* 17s., u.t. 47 yrs., g.r. nil 2,565
Maida-vale.—Warrington-cres., l.g.r. 20*l.*, u.t. 54 yrs., g.r. 2*l.* 335
Upton Park.—Harold-rd., l.g. rents 44*l.*, u.t. 56 yrs., g.r. 4*l.* 700

By NORTON, TRIST, & GILBERT.

Paddington.—Hazell-rd., etc., f.g. rents 33*l.*, reversion in 79 yrs. 790

By RUTLEY, SON, & VINE.

Camden Town.—28 and 30, Werrington-st., u.t. 45 yrs., g.r. 24*l.*, y.r. 88*l.* 600
61, Pratt-st., u.t. 34½ yrs., g.r. nil, y.r. 38*l.* 400
208 and 212, Gt. College-st., u.t. 36½ yrs., g.r. 12*l.*, y.r. 92*l.* 895
Hampstead Road.—70, Charrington-st., u.t. 40 yrs., g.r. 2*l.* 15s., y.r. 50*l.* 635
Caledonian Road.—8, Blundell-st., u.t. 47½ yrs., g.r. 6*l.*, w.r. 54*l.* 12s. 265
Holloway.—73, Benwell-rd., u.t. 59½ yrs., g.r. 8*l.*, q.r. 36*l.* 350

By SOUTHON & ROBINSON.

Westerham, Kent.—Froghole-la., freehold gdn. and wood land, 1 a. 3 r. 3 p., p 300
Crockham Hill, Kent.—1, 2 and 3, Owen Cottages, f., y.r. 43*l.* 11s. 700
1 and 2, Forge Cottages, and cottage adjoining, f., y.r. 67*l.* 14s. 1,420
Oakdale-la., three freehold residences, y.r. 65*l.* 1,110

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By MAPLE & Co.
Redbourn, Herts.—"Foster's Farm," 86 a. 2 r. 17 p., f. £2,500
Three freehold enclosures, 48 a. 3 r. 34 p... 850

By DOUGLAS YOUNG & Co.
Brockley.—221 to 227 (odd), Brockley-rd., u.t. 68 yrs., g.r. 22*l.*, y.r. 149*l.* 1,600
Breakspeares-rd., l.g. rents 68*l.* u.t. 73 yrs., g.r. 1*l.* 10s. 1,870
Breakspeares-rd, l.g. rents 32*l.* 10s., u.t. 72 yrs., g.r. 4*l.* 550
Clapham. — Rodenhurst-rd., "Woodlands Lodge," area ¼ of an acre, f., p. 750
Clacton-on-Sea, Essex.—2, 4, and 6, Marine-parade, f., y.r. 174*l.* 10s. 2,950

By WYATT & SON (at Chichester).
New Fishbourne, Sussex.—Two freehold cottages, y.r. 23*l.* 10s. 305
"East Fields," enclosure, 5 a. 0 r. 14 p., f. 500
"Crooked Croft," 2 a. 1 r. 14 p., f. 220
"White Cross Field," 2 a. 2 r. 30 p., f..... 255
Emsworth, Sussex.—Plot of building land, 0 a. 3 r. 20 p., f. 100

By W. BROWN & Co. (at Aylesbury).
Weston Turville, Bucks. — "Firs Farm," 2 a. 0 r. 4 p., f. 500
House, orchard, and three fields, 18 a. 2 r. 26 p., f. 1,700
"Marroway Field," 14 a. 3 r. 21 p., f. 825
"Rosebank," f., y.r. 20*l.* 400
Freehold house, shop and cottage, p. 400
Bierton, Bucks.—"The Poplars," and 3 acres, f., p. 825

DEBENHAM, TEWSON, & Co. (at Sandown).
Sandown, Isle of Wight.—43 and 45, High-st., (s.), area 2,000 ft., y.r. 120*l.* 2,270

KEMSLEYS' (at Romford).
Romford, Essex.—Malborough-rd., "Gordon Villa," f., w.r. 24*l.* 14s. 300
Havering-rd, "Norfolk Cottage," f., p. 200
Rainham, Essex.—1 to 6, Park-buildings, f., w.r. 85*l.* 16s. 920
1 and 2, Jessamine-villas, w.r. 49*l.* 8s., and plot of land adjoining, f. 500

By J. D. WOOD & Co. (at Buckingham).
Chetwode, Bucks. — "Manthorne Farm," 184 a. 2 r. 1 p., f. 5,000

By R. & A. G. THOROWGOOD (at Hoddesdon).
Hoddesdon, Herts.—High-st., a freehold residence, y.r. 60*l.* 1,110
Brocket-rd., the Hoddesdon Saw and Joinery Works, f., y.r. 20*l.* 535

By DANN & LUCAS (at Gravesend).
Northfleet, Kent.—Perry-st., freehold building land, 2 a. 0 r. 21 p. (with erection thereon) 750
Southfleet - rd., freehold building land, 3 a. 1 r. 18 p. 1,000
Southfleet - rd., freehold building land, 13 a. 1 r. 3 p. 2,900

June 9.—By ANLEY & Co.
Camberwell. — Ivanhoe-rd., etc., f.g. rents 24*l.* 3s., reversion in 72 yrs. 590

By BUNCH & DUKE.
Dalston.—106, Forest-rd., u.t. 47 yrs., g.r. 9*l.*, e.r. 57*l.* 12s. 380

By CHESTERTON & SONS.
Hyde Park.—11, Sussex-sq., and 49, Bathurst-mews, u.t. 34 yrs., g.r. 45*l.*, p. 4,600

By FAREBROTHER, ELLIS, & Co.
Hoxton.—Whitmore-rd., etc., l.g. rents 106*l.*, u.t. 15 yrs., g.r. 20*l.* 805

By HARDS & BRADLY.
Bermondsey.—21 and 23 Reverdy-rd., u.t. 35½ yrs., g.r. 9*l.*, y.r. 83*l.* 4s. 585
57, Fort-rd., u.t. 25 yrs., g.r. 3*l.* 15s., w.r. 39*l.* 215
Old Kent-road.—27 to 35 (odd), Ossory-rd., u.t. 35½ yrs., g.r. 25*l.*, w.r. 195*l.* 1,120
Rotherhithe.—75 to 81 (odd), Barkworth-rd., u.t. 66 yrs., g.r. 20*l.*, w.r. 135*l.* 4s. 1,010

By H. J. BLISS & SONS.
Forest Gate.—265 to 273 (odd), Strone-rd., f., w.r. 163*l.* 16s. 1,485
180 and 182, Shrewsbury-rd. (s.), u.t. 93 yrs., g.r. 12*l.*, y.r. 80*l.* 680
Clapton.—44, Pembury-rd., u.t. 37½ yrs., g.r. 15*l.* 10s., e.r. 110*l.* 655

By JENKINS & SONS.
Brockley.—44, Breakspears-rd., u.t. 70 yrs., g.r. 11*l.*, p. 955
12, Cranfield-rd., u.t. 62½ yrs., g.r. 5*l.* 10s., y.r. 35*l.* 345
Cranfield-rd., l.g.r. 15*l.* 10s., u.t. 62½ yrs., g.r. 1*l.* 255
16, Foxberry-rd., u.t. 60 yrs., g.r. 4*l.*, e.r. 30*l.* 260

C. C. & T. MOORE.
Winchmore Hill.—Green Lanes, "The Cedars," and 1¼ acre, f., p. 2,525
Mile End.—124, Devonshire-st., u.t. 32 yrs., g.r. 2*l.*, y.r. 24*l.* 265
92, Bridge-st. (s.), u.t. 55½ yrs., g.r. 3*l.*, y.r. 55*l.* 730
29 and 33, Mossford-st., u.t. 55½ yrs., g.r. 10*l.* 10s., w.r. 78*l.* 600
33 and 35, Cephas-st., u.t. 26 yrs., g.r. 10s., y.r. 54*l.* 555
Old Ford.—Milton-rd., f.g.r. 65*l.*, reversion in 27 yrs. 1,650
Poplar.—Brunswick-st., f.g.r. 12*l.* 3s., reversion in 16 yrs. 700
Canning Town.—22 to 36 (even), Roscoe-st. (including the "Yorkshire Grey" b.h.), u.t. 46 yrs., g.r. 16*l.* 16s., y.r. 154*l.* 14s. 1,250
Stoke Newington.—23, Victoria-gr., u.t. 37 yrs., g.r. 5*l.*, w.r. 27*l.* 6s. 200
Leytonstone.—Wallwood-rd., "Inchcolm," f., p. 760

By NEWBON, EDWARDS, & SHEPHARD.
Marylebone.—6 and 7, Gt. James-st. (s.), f., y.r. 80*l.* 1,230
Holloway.—7, 8, and 9, Williamson-st., u.t. 41½ yrs., g.r. 15*l.*, y.r. 108*l.* 860
Caledonian-road.—10, Sutterton-st., u.t. 43 yrs., g.r. 6*l.*, y.r. 32*l.* 305
Barnsbury.—6, Richmond-st., u.t. 37½ yrs., g.r. 8*l.*, y.r. 45*l.* 335
Holloway.—1, Stonenest-st., u.t. 61 yrs., g.r. 6*l.* 6s., y.r. 39*l.* £330
Stroud Green.—23, Marquis-rd., u.t. 62½ yrs., g.r. 6*l.* 6s., y.r. 39*l.* 370
Crouch-hill.—35, 37, and 39, Heathville-rd., u.t. 93 yrs., g.r. 27*l.*, y.r. 159*l.* 1,670
Canonbury.—9, Northampton-pk., u.t. 22 yrs., g.r. 5*l.*, y.r. 55*l.* 390
Islington.—314a, 316, and 318, Essex-rd. (s.), and 156, Church-rd. (stabling), u.t. 18 yrs., g.r. 150*l.*, y.r. 309*l.* 1,000

By STIMSON & SONS.
Sydenham.—1 to 40, Stanton-sq., u.t. 65 yrs., g.r. 181*l.* 10s., w.r. 955*l.* 10s. 4,000
Clapham.—High-st., f.g.r. 5*l.* 12s., reversion in 6 yrs. 2,250
Camberwell.—134 to 154 (even), Southampton-st., f., y.r. 278*l.* 8s. 3,450
37, Elmington-rd., u.t. 68½ yrs., g.r. 5*l.* 5s., w.r. 41*l.* 12s. 295
10 to 34 (even), 14A and 16A, Diamond-st., u.t. 43½ yrs., g.r. 63*l.* 10s., y.r. 402*l.* 2s. 2,280
Dulwich.—28 to 38 (even), Landells-rd., u.t. 73½ yrs., g.r. 27*l.*, w.r. 187*l.* 4s. 1,195
Peckham.—102, Shenley-rd., u.t. 72½ yrs., g.r. 6*l.*, y.r. 38*l.* 375

By G. A. WILKINSON & SON.
New Bond-street. — 44, Conduit-st. (shop and gallery), area 2,646 ft., Corporation leasehold, g.r. 9*l.* 7s. 6d., fine 65*l.* 12s. 6d., y.r. 600*l.* 13,900
23, Conduit-st. (s.), area 1,205 ft., Corporation lease, g.r. 5*l.*, fine 35*l.*, y.r. 350*l.* 8,200
20, Brook-st. (s.), area 638 ft., Corporation lease, g.r. 3*l.* 2s. 6d., fine 21*l.* 17s. 6d., y.r. 250*l.* 6,250
Brighton.—161, North-st., and 1, New-rd. (s.), f., y.r. 350*l.* 7,550

By W. BROWN & Co. (at Tring).
Wendover, etc., Bucks.—"Milesfield Farm," 69 a. 1 r. 12 p., f. 1,850
Northchurch, Herts.—2, River-ter., f., w.r. 6*l.* 18s. 8d. 120

By ELLIOTT, ELLIS, & Co. (at Plymouth).
St. Stephen's, Cornwall.—"Carkeel Estate," 136 acres, f. 3,750

June 10.—By C. RAWLEY CROSS & Co.
Shepherd's Bush.—1 to 10, Loris-rd., u.t. 72½ yrs., g.r. 10*l.*, y.r. 458*l.* 5,775

By HAMPTON & SONS.
Chalfont St. Giles, Bucks.—A freehold meadow, 6 a. 1 r. 0 p. 310
"Misbourne Farm," 33 a. 3 r. 8 p., f., ... 1,650
1, 2, and 3, Harewood-cottages, f., w.r. 19*l.* 10s. 350
Chalfont St. Peter, Bucks.—A freehold water meadow, 7 a. 3 r. 20 p. 400
Amersham, Bucks.—A freehold water meadow, 3 a. 2 r. 27 p. 130

By HARMAN BROS.
Teddington, Middx.—12, Anlaby-rd., u.t. 75½ yrs., g.r. 7*l.* 10s., e.r. 35*l.* 275

By JONES, LANG, & Co.
Hornsey Rise.—Hornsey-la., "Hawthorne Bank," u.t. 63½ yrs., g.r. 20*l.*, p. 800

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

TO CORRESPONDENTS.

F. B.—T. J. S.—A. A. W. (Below our limit).

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MEETINGS.

SATURDAY, JUNE 18.

Royal Institute of British Architects.—The President's "At Home," 8.30 to 11 p.m. Exhibition of Architects' Sketches. (The Memorial to Mr. F. C. Penrose in the Crypt of St. Paul's to be Unveiled at 3.30 p.m.)

Architectural Association.—Visit to Penshurst.

Edinburgh Architectural Association (Associates' Section).—Visit to Donibristle.

St. Paul's Ecclesiological Society.—Visit to Littleton, Middlesex, under the guidance of Mr. T. Garratt. A train leaves Waterloo, North Station, at 2.15 p.m.

MONDAY, JUNE 20.

Royal Institute of British Architects.—(1) A Special General Meeting to confirm as required by Clause 33 of the Charter, the Resolution passed at the Meeting of the 6th June with respect to the addition to the first clause of By-law 3; (2) Sixteenth General Meeting (Ordinary) to present the Royal Gold Medal for the promotion of Architecture, conferred by His Majesty the King, to M. Auguste Choisy (Hon. Corr. M.), Inspecteur-Général honoraire des Ponts et Chaussées, Paris. 8 p.m.

WEDNESDAY, JUNE 22.

Builders' Foremen and Clerks of Works' Institution.—Half-yearly Meeting of the Directors. 8 p.m.

SATURDAY, JUNE 25.

Edinburgh Architectural Association.—Annual Excursion, to (1) Glamis Castle, (2) Restenneth Priory.

Junior Institution of Engineers.—Visit to the Chelsea Generating Station of the Underground Electric Railways Company of London, Lot's-road, Chelsea. 3 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks.	1 16 0	per 1000	alongside, in river.
Bough Stocks and Grizzles	1 13 0	,,	,, ,,
Facing Stocks ...	2 12 0	,,	,, ,,
Shippers	2 10 0	,,	,, ,,
Flettons	1 10 0	,,	at railway depôt.
Red Wire Cuts ...	1 13 0	,,	,, ,,
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Runbon Facing	5 0 0	,,	,, ,,
Best Blue Pressed Staffordshire ...	4 4 0	,,	,, ,,
Do. Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks.....	4 8 0	,,	,, ,,
GLAZED BRICKS.			
Best White and Ivory Glazed Stretchers	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats.....	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers...	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamferred, Squints.	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats.....	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers...	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamferred, Squints,	14 0 0	,,	,, ,,
Second Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.

	s. d.		
Thames and Pit Sand.....	7 3	per yard,	delivered.
Thames Ballast.....	6 0	,,	,,
Best Portland Cement	30 0	per ton,	,,
Best Ground Blue Lias Lime	21 0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.	
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	,,	,,
PORTLAND STONE (20 ft. average)—			
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 1	,,	,,
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 2½	,,	,,

	s. d.		
Ancaster in blocks	1 11	per ft. cube,	deld. rly. depôt.
Beer ,, ...	1 6	,,	,,
Greenshill ,, ...	1 10	,,	,,
Darley Dale in blocks...	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Closeburn Red Freestone	2 0	,,	,,
Red Mansfield ,,	2 4	,,	,,

YORK STONE—*Robin Hood Quality*

	s. d.		
Scappled random blocks	2 10	per ft. cube,	,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super.	,,
6 in. rubbed two sides ditto, ditto	2 6	,,	,,
3 in. sawn two sides slabs (random sizes)	0 11½	,,	,,
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	,,	,,
1½ in. to 2 in. ditto, ditto	0 6	,,	,,
HARD YORK—			
Scappled random blocks	3 0	per ft. cube,	,,
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super.	,,

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STONE.—(*continued*).

	s. d.	
6 in. rubbed two sides Ditto	3 0	per ft. sup. deld. rly. depot.
3 in. sawn two sides (slabs random sizes)	1 2	" "
3 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
" " " 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt
" " " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 first quality "	13 0 0	" "
20 × 12 " " "	13 15 0	" "
16 × 8 " "	7 5 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 " "	6 12 6	" "
20 × 10 best Eureka unfading green	15 17 6	" "
20 × 12 " "	18 7 6	" "
18 × 10 " "	13 5 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 12 6	" "
18 × 10 " "	9 12 6	" "
16 × 8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. " "
Best Broseley tiles	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " " "
Hip and Valley tiles	4 0	per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Stafford shire do. (Peakes)	51 9	per 1000 " "
Do. Ornamental do	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced	50 0	per 1 00 " "
Do. pressed	47 6	" " "
Do. Ornamental do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0	
Deals: best 3 by 4	14 10 0	15 10 0	
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0	
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	" " "	
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0	
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0	
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.	
¾ in.	1 0 0	"	
	At per load of 50 ft.		
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Small timber (6 in. to 8 in.)	3 0 0	3 10 0	
Swedish balks	2 15 0	3 0 0	
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0	

JOINERS' WOOD.

White Sea:	At per standard.	
first yellow deals, 3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—

WOOD.—(*continued*).

	At per standard. £ s. d.	£ s. d.
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ...	7 5 0
Compound Girders, ordinary sections	8 2 6 ...	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ...	8 17 6
Flitch Plates	8 5 0 ...	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns	7 2 6 ...	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	7 5 0 ...	7 15 0
Staffordshire Crown Bars, good merchant quality	7 15 0 ...	8 5 0
Staffordshire "Marked Bars"	10 0 0 ...	—
Mild Steel Bars	8 15 0 ...	9 5 0
Hoop Iron, basis price	9 5 0 ...	9 10 0
" " Galvanized	17 10 0 ...	—
("And upwards, according to size and gauge.)		
Sheet Iron (Black)— Ordinary sizes to 20 g.	9 15 0 ...	—
" " 24 g.	10 15 0 ...	—
" " 26 g.	12 5 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0 ...	—
Ordinary sizes to 22 g. and 24 g.	13 5 0 ...	—
" " 26 g.	14 5 0 ...	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	16 0 0 ...	—
" " 22 g. and 24 g.	16 10 0 ...	—
" " 26 g.	18 0 0 ...	—
Galvanised Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0 ...	—
" " 22 g. and 24 g.	13 0 0 ...	—
" " 26 g.	13 15 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0 ...	—
" " " 26 g.	14 0 0 ...	—
Cut nails, 3 in. to 6 in.	9 0 0 ...	9 10 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 10 0 ...	—
Pipe in coils	15 0 0 ...	—
Soil pipe	17 10 0 ...	—
Compo pipe	17 10 0 ...	—
ZINC—Sheet— Vieille Montagne ...ton	27 5 0 ...	—
Silesian	27 0 0 ...	—
COPPER— Strong Sheet...per lb.	0 0 10½ ...	—
Thin " "	0 0 11½ ...	—
Copper nails "	0 0 11 ...	—
BRASS— Strong Sheet "	0 0 10 ...	—
Thin " "	0 0 11 ...	—
TIN—English Ingots "	0 1 4 ...	—
SOLDER—Plumbers' "	0 0 6½ ...	—
Tinmen's "	0 0 8 ...	—
Blowpipe "	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

	21d. per ft. delivered.
15 oz. thirds	21d. per ft.
" fourths	1½d. " "
21 oz. thirds	3d. " "
" fourths	2½d. " "
26 oz. thirds	4d. " "
" fourths	3½d. " "
32 oz. thirds	5d. " "
" fourths	4½d. " "
Fluted Sheet, 15 oz.	3d. " "
" 21 oz.	4d. " "
⅛ Hartley's Rolled Plate	1½d. " "
¼ " " " "	1½d. " "
" " " "	2½d. " "

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes or barrels, per gallon	0 1 5
" " " in drums "	0 1 8
Boiled " in pipes or barrels "	0 1 8
" " " in drums "	0 1 11
Turpentine, in barrels "	0 3 7
" in drums "	0 3 9
Genuine Ground English White Lead per ton	19 0 0
Red Lead, Dry "	19 0 0
Best Linseed Oil Putty per cwt.	0 6 6
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0

VARNISHES, &c.—(*continued*).

	Per Gallon. £ s. d.
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

PUBLISHER'S NOTICES.

Nat. Tel., 6112, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXV. (July to December, 1903) was given as a supplement with issue of January 9 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each: also

READING CASES (Cloth), with Strings, price 9d. each.

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Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE noon on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS advertising in "THE BUILDER" may have *Replies addressed to the Office*, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BRENTWOOD (Essex).—For the erection of auction mart, The Parade. Mr. Hugo R. Bird, architect, St. Thomas'-gate, Brentwood:—

S. Parmenter	£429 16	F. W. Jarvis	£384 0
W. Harbrow	423 0	F. W. Burtwell,	
E. Dix	420 0	Brentwood*	355 0

BRENTWOOD (Essex).—For the erection of brigade hall, The Parade. Mr. Hugo R. Bird, architect, St. Thomas'-gate, Brentwood:—

W. Harbrow	£432 0	F. W. Jarvis	£395 0
S. Parmenter	424 16	F. W. Burtwell	
E. Dix	409 0	Brentwood*	395 0

CHELSFIELD (Kent).—For additions and alterations to the Bull's Head, Pratt's Bottom. Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington:—

T. D. Graty	£895 0	C. Dalner	£772 0
E. Martin & Son	875 0	W. Owen	749 7
H. Somerford & Son	848 0	Stebbings & Pannett	738 0
R. A. Lowe	789 0	W. Hodges*	705 0

CHISLEHURST (Kent).—For additions to a private residence, and external works. Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington:—

T. Rider & Son	£809 0	Stebbings &	
B. J. White & Son	645 0	Pannett‡	£452 0
R. A. Lowe	624 18		

‡ Accepted for additions only.

CORK.—For alterations and additions to Castle View, Passage West, for Dr. Beamish. Messrs. W. H. Hill & Son, architects, 28, South-mall, Cork:—

F. Dolan, builder, Queenstown, co. Cork* £569

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COWPEN.—For making-up streets, for the Urban District Council. Mr. R. Grieves, Surveyor, Seaforth-street, Waterloo, Blyth :—

G. E. Simpson	£795 13 4	J. Robson, New-castle-on-Tyne*	£661 18 0
J. Shannon	736 10 5		

EDMONTON. — For an additional story to the maternity wards at the workhouse, Upper Edmonton, N., for the Guardians of the Edmonton Union. Mr. T. E. Knightley, architect, 106, Cannon-street, E.C. Quantities by Mr. Joseph Peebles, 26, John-street, Bedford-row, London, W.C. :—

General Builders, Ltd.	£3,379 0 0	W. Lawrence & Son	£2,938 0 0
J. Thomas	3,301 11 0	Pavey & Son	2,906 0 0
A.E.Townsend & Coles	3,273 0 0	C. R. Price	2,857 0 0
A. Fairhead & Son	3,114 0 0	Banyard & Son	2,843 0 0
Green & Smith	2,998 0 0	S. L. Grist	2,678 0 0
A. Porter	2,991 0 0	H. Knight & Son, Tottenham*	2,550 0 0
A. Monk	2,989 0 0		

ENNISKILLEN. — For alterations, repairs, and painting to Protestant Hall. Mr. T. Elliott, architect, Darling-street, Enniskillen :—

J. Harvey, Enniskillen	£330 11 8	J. Hynes & Sons	£324 15 6
		J. Donnelly	284 13 0

[The Committee struck out some of the works contemplated, and have arranged with Mr. Harvey to carry out the remainder for the amount of £240 4s. 1d.]

GATESHEAD.—For the enlargement of the Nuns Lane school, for the Education Committee. Mr. F. W. Purser, architect, 10, West-street, Gateshead :—

E. T. George	£1,050	T. Hutchinson	£958
J. Hymers & Co.	1,046	W. Jackson	950
Stephen Buy	1,038	W. C. Tyrie	931
Elliot Brothers	1,034	(Unsigned)	929
Emmet & Co.	1,028	John Milne	921
Raven & Hitcham	996	W. Hall	905
J. Lunn	993	T. Hunter	901
R. Veitch & Sons	987	S. Davidson	890
J. Ross & Son	984	H. & B. Arkless, Gateshead*	889
R. Harris & Son	971		
I. Bewley	965	J. McGowan	888

GILFACH BARGOED (Wales).—For making new road, laying main drains, etc., for Mr. A. C. Thomas. Mr. W. Harris, architect and surveyor, Gilfach Bargoed :—

Price & Smith	£258 8 0	Wilkins & Cooper	£207 7 0
F. Ashley	254 1 3	Barry & Poole‡	
W. Lewis	235 18 0	Barnes, Chaplin, & Co., Cardiff*	199 0 0
J. Powell	227 17 0		
E. Edwards	221 18 6		
L. P. Edwards	219 1 8		
D. G. Vaughan	217 0 0		

‡ Scheduled.

GORTON.—For erecting offices, etc., at the St. George's School, Abbey Hey, for the Education Committee. Mr. J. W. Wiles, Surveyor, Town Hall, Gorton :—

G. Ginger, Longsight, Manchester* £175 10

GRAVESEND.—For alterations and additions to out-patient block, for the Committee. Mr. W. M. Dean, architect, 21, Park-place, Gravesend. Quantities by Messrs. J. Gandy & Bennison, 22, Essex-street, Strand, W.C. :—

Myall & Upson	£2,300 0 0	Beal & Hubbard	£1,673 0 0
W. Manders	2,137 5 10	Multon & Wallis	1,618 0 0
J. M. Dering	1,900 0 0	G. Browning	1,567 0 0
B. E. Nightingale	1,688 0 0	W. H. Archer & Son, Gravesend*	1,495 0 0
Thomas & Edge	1,681 0 0		
A. E. Tong	1,674 1 5		

GRIMSBY.—For horse-keeper's house, for the Corporation Sanitary Committee. Mr. H. Gilbert Whyatt, Borough Engineer and Surveyor, Town Hall-square, Grimsby :—

B. Nightingale	£415 8 9	F. Swallow	£354 19 8
G. Cook	365 0 0	J. Markham	333 15 0
Holmes & Richardson	356 10 0	T. R. Waterman, Grimsby*	323 10 0

GRIMSBY.—For new urinal, Convamore-road, for the Corporation. Mr. H. Gilbert Whyatt, Borough Engineer and Surveyor :—

Hewins & Goodhand	£245 0 0
T. R. Waterman	228 15 0
Gilbert & Kirton	226 10 0
W. Burkitt, Hull*	215 19 9

HORTON.—For plumber, plasterer, and slater work for eleven houses in Arncliffe-terrace. Mr. W. Rycroft, architect, Bank-buildings, Manchester-road, Bradford :—

Plumbing, etc.

G. T. Smith, 20, Whetley-hill, Bradford £380

Plasterer and Concreter.

C. Marsden & Son, Cecil-avenue, Bradford .. 275

Slaters (for Westmoreland slates).

T. Nelson & Son, Springfield-place, Bradford 245

HULL.—For erecting schools, Hawthorn-avenue, for the Trustees of the Primitive Methodist Connexion. Mr. T. Beecroft Atkinson, architect, 11, Trinity House-lane, Hull :—

Builder : J. T. Levitt, 84, Holderness-road	Total cost. £2,986 1 5
Joiner : G.W. Berridge, 64, Holderness-road	
Plumber : F. Abba, Charlotte-street	
Painter : J. Porter, J.P., Holderness-road	
Stonemason : J. Peers, 144, Beverley-road	
Slater : Smith & Hunter, 25, Anlaby-road	

[All of Hull.]

IPSWICH.—For alterations and additions to laundry at St. John's Home, Ipswich, for the Board of Guardians of the Ipswich Union. Mr. Henry J. Wright, architect, 4, Museum-street, Ipswich. Quantities by the architect :—

A. Sadler	£1,070	T. Parkington & Son	£1,000
J. C. Smith	1,057	G. Grimwood & Sons*	997
H. J. Linzell	1,057		
Cubitt & Gotts	1,005		

[All of Ipswich.]

KEIGHLEY.—For erecting two phthisis pavilions at the Union Infirmary, and tailors' workroom, etc., at the workhouse, for the Guardians. Messrs. Moore & Crabtree, architects, York-chambers, Keighley :—

Excavators and Masons : Smith Sharp, Oakworth, Keighley	£291 1 5
Joiners : J. Driver & Son, Goulbourne-street, Keighley	200 5 11
Slaters : W. H. & E. Walton, Ashfield-terrace, Bingley	51 17 0
Plumbers : W. & J. Harrison, 23, South-street, Keighley	63 10 0
Plasterers : J. King, Russell-street, Keighley	69 0 0

KILMARNOCK.—For laying footpaths, for the Town Council. Mr. R. Blackwood, Burgh Surveyor, Market Bridge, Kilmarnock :—

	Per sq. yd. s. d.
Concrete Work.	
Boyd & Forrest, Kilmarnock	3 8½
Staffordshire Pavings.	
M. Muir & Co., Kilmarnock	3 10

LAISTERDYKE.—For extension of mill at New-lane Mills. Messrs. T. Barker & Son, engineers and architects, 5, Bank-street, Bradford :—

Mason's and Joiner's Work : H. Waterhouse & Sons, Tong-street, Bradford*	£1543 0
Iron and Steel Work : Roberts & Co., Ltd., Dudley-hill, Bradford*	639 10
Slater's Work : Hill & Nelson, Bradford*	60 0
Plumber's and Glazier's Work : J. Dyson, Baildon*	56 0
Plasterer's Work : T. Cordingley & Sons, Bradford*	21 10
Painter's Work : R. Beetham, Laisterdyke*	52 0

LARNE.—For extending the water supply, for the Urban District Council. Mr. J. H. H. Swiney, engineer, Avenue-chambers, Belfast :—

J. Graham	£3,737 6 0	J. Ross & Sons	£3,493 1 2
T. McClughan	3,648 6 0		
W. M'Neill & Sons	3,612 16 0		
M. Green	3,607 17 2		
Higgusty & Gault	3,607 17 1	McKee & McNally	3,281 0 0

LEYTON.—For constructing a sewer in Union-road and Downsell-road, for the Urban District Council. Mr. W. Dawson, M.Inst.C.E., Town Hall, Leyton :—

T. Adams	£1,652 5 0	G. G. Rayner	£1,471 5 0
Muirhead, Greig, & Matthews	1,580 15 0	G. Harber	1,452 7 0
J. Jackson	1,508 5 0	G. J. Anderson	1,362 6 0
G. Bell	1,496 10 0	F. J. Coxhead	1,352 0 0
Killingback & Co.	1,473 7 6	W. Manders	1,262 19 2
		O. T. Gibbons, Leytonstone*	1,191 15 0

[Surveyor's estimate, £1,260.]

LEYTON.—For private street works, for the Urban District Council. Mr. W. Dawson, Surveyor, Town Hall, Leyton :—

G. Harber	£13,869 10 0	A. W. Porter	£9,973 4 7
W. H. Wheeler	12,484 6 0	G. J. Anderson	9,964 0 4
W. Griffiths & Co., Ltd.	10,620 11 0	J. Jackson	9,445 9 0
T. Adams	10,253 2 11	W. Manders, Leyton*	8,834 6 4

[Surveyor's estimate, £9,650.]

LONDON.—For supply and erection of flag-making plant in connexion with refuse destructor at sewage works, Corney Reach, Chiswick, for the Chiswick Urban District Council. Messrs. Swinburne, Cooper, & Baillie, engineers, 82, Victoria-street, Westminster, S.W. :—

R. Taylor	£6,500
Sir Hiram Maxim Co. (Musker's plant)	880
Brightside Foundry Co.	825
C. & A. Musker, Ltd.‡	800
Fawcett, Preston, & Co.	630
Horsfall Co. (Queen's Engineering Works' plant)	625
H. Berry & Co.	560
Horsfall Co. (Fielding & Platt's plant)	529
Rice & Co.	490
Fielding & Platt, Gloucester*	481
Sutcliffe, Speakman, & Co.§	315

‡ Alternative prices, £825, £850.
§ Alternative prices, £400, £415, £500, £465.

LONDON.—For repainting works, Great Eastern-street bridge and Thames Embankment, for the London County Council :—

Vigor & Co.	£565 9 9	E. Proctor & Son	£455 0 0
W. Dudley	545 11 0	W. E. Westgate, Romford*	424 5 2
A. H. Inns	539 10 0		

LONDON.—For replacing the range of lavatory basins at the Gideon-road School, Battersea, with fireclay basins, and for carrying out other works for the London County Council :—

Whitehead & Co.* £247

LONDON.—For repaving Wandsworth and Vauxhall (temporary) bridges, for the London County Council :—

J. Mowlem & Co.	£2,010 0 0
Improved Wood Pavement Co., Ltd.	1,513 15 0
W. Griffiths & Co.	1,487 1 8
Acme Flooring and Paving Co., Ltd., London*	1,439 3 4

LONDON. — For additional water-tube boilers, Greenwich generating-station (first portion), for the London County Council :—

J. Thompson	£27,700 0 0
Stirling Co.	23,200 0 0
Babcock & Wilcox, Ltd.	18,978 0 0
B. R. Rowland & Co., Ltd.	18,845 0 0
J. Musgrave & Sons, Ltd.	18,131 17 0
R. Hornsby & Sons, Ltd.	18,131 17 0
Richardsons, Westgarth, & Co., Ltd.	18,131 0 0
Stirling Boiler Co., Ltd., Edinburgh*	16,271 0 0

LONDON.—For alterations and addditions to Royal Court Theatre, Sloane-square, S.W. Mr. C. E. Lancaster Parkinson, architect, 44, Bedford-row, W.C. Quantities by Messrs. Young & Brown :—

Patman & Fotheringham	£4,160	H. Lovatt	£3,858
T. W. Heath & Sons	4,081	Foster Bros.	3,854
W. Willett	3,960	Leslie & Co.	3,715
Lole & Lightfoot	3,907	Spencer, Santo, & Co.	3,400
Townsend & Coles	3,893		

LONDON.—For paving works, Tooting, London County Council :—

J. G. White & Co., Ltd.* £3,315 0 6

LONDON.—For main switchgear, Greenwich generating station (first portion), for the London County Council :—

Dick, Kerr, & Co., Ltd.	£37,019 0 0
Elliott Bros.	36,706 5 8
Electric Construction Co., Ltd.	32,000 0 0
British Thomson-Houston Co., Ltd.	25,591 10 0
British Westinghouse Electric & Manufacturing Co., Ltd., London*	22,910 0 0
Cowans, Ltd.‡	3,881 0 0
Electric & Ordnance Accessories Co., Ltd‡	3,627 15 8

‡ Incomplete Tender.

LONDON.—For building a house in Goswell-road, for the London County Council :—

F. & F. J. Wood	£2,185	F. Lapthorne & Co.	£1,958
Patman & Fotheringham	2,107	J. Grover & Son	1,885
Holloway Bros.	1,965	Stimpson & Co., London*	1,750

LONDON.—For docking and repairs of s.s. *Binnie*, for the London County Council :—

Thames Iron Works, etc., Co., Ltd.	£1,898 13 6
Brown's Dry Dock & Engineering Co., Ltd.	1,473 16 0
Mills & Knight	1,350 17 0
London Graving Docking Co., Ltd.	1,315 12 0
Fletcher, Son, & Fearnall*	1,238 0 0

LONDON.—For repairing and re-paving Chelsea Bridge, for the London County Council :—

J. Mowlem & Co.	£6,804 19 2
Acme Flooring & Paving Co., Ltd.	5,371 9 0
F. Morton & Co.	5,310 15 5
Muirhead, Greig, & Matthews, London*	4,736 11 9

LONDON.—For the erection of a warehouse, Kimberley-road, Willesden-lane, N.W., for Messrs. Lawrence & Aitken. Mr. J. Bruce Merson, architect, 76, High-road, Kilburn, N.W. Quantities by Mr. W. Prows Broad, 3, Cromwell-grove, West Kensington Park, W. :—

Grover & Son	£3,687	Midland & Richardson	£3,260
Pearson	3,599	G. Neal	3,227
W. King & Sons	3,526	R. J. World	3,105
Godson & Sons	3,515	Perry Bros.	3,087
A. Webber	3,479	Ford & Walton	2,979
Wisdom Bros.	3,300	Braid, Pater, & Co., Ltd.*	2,970
W. Nash	3,289		

LONDON.—For erecting offices and printing works at Castle-lane, Westminster, S.W., for Messrs. Norton & Gregory, Ltd. Messrs. L. Littlewood and O. Mahomed, architects, 3a, Bank-buildings, Balham, S.W. Quantities supplied by Mr. E. H. Dance, surveyor, 185, Victoria-street, S.W. :—

T. Robarts	£7,900	F. G. Minter	£7,332
Lole & Lightfoot	7,840	Kirk & Kirk	7,187
M. Pearson	7,660	B. E. Nightingale	6,987
F. J. Shopland	7,547	Rice & Son	6,969
Patman & Fotheringham	7,480	W. H. Lorden & Son*	6,887
J. Carmichael	7,450		

MARDY (Wales).—For alteration and erection of a vestry to the Seion Baptist Chapel, Mardy :—

J. Jenkins, builder, Mardy, Glam. £852 10 0

NEWARK.—For cast-iron water mains and castings for Collingham water supply, for the Rural District Council. Messrs. H. Walker & Son, engineers, Albion-chambers, King-street, Nottingham :—

Cochrane & Co.	£1,489 14 2	Stanton Iron Works Co., Ltd.	£1,419 6 0
Clay Cross Co.	1,343 14 6		
Staveley Coal & Iron Co., Ltd., Chesterfield*	1,305 15 0	Sheepbridge Coal & Iron Co., Ltd.	1,321 8 1
		Butterley Co., Ltd.	1,331 16 3

NUNEATON.—For new school in Queen-road, for the Nuneaton and Chilvers Coton Urban District Council Education Committee. Mr. Harry Quick, architect, 64, Hertford-street, Coventry :—

R. Gibbs, King's Heath* £10,130

NYNEHEAD (Wellington, Somerset).—For the reconstruction of the drainage, sanitary arrangements, and alterations in the water supply at Nynehead Court, for Colonel Sanford, C.M.G. Mr. J. Moss-Flower, engineer, 2, Victoria-mansions, Westminster, and Bristol :—

L. Thomas & Son, The Triangle, Clifton, Bristol, accepted on a schedule of prices.

PERTH.—For constructing new sewers along Burnside (Craigie), Priory-place, and Glover-street, for the Town Council. Mr. R. M'Killop, Burgh Surveyor, 12, Tay-street, Perth :—

P. Girrity, West-grove, Dundee,* on schedule prices.

PETERSFIELD.—For road works, High-street, Sheep-street, and Sussex-road (taking up old pavements and repaving), for the Urban District Council. Mr. H. T. Keates, Town Surveyor, Petersfield :—

	Per yard super. s. d.
Cunningham, Forbes, & Co.	7 0
Adamant Stone Co.	6 6
Victoria Stone Co., Bishopsgate-street Without*	6 4
T. Wood & Son	6 1
H. Williams	5 11
Grounds & Newton	5 4
Stuart's Granolithic Stone Co.	4 10½

PLYMOUTH.—For the erection of a villa residence, Bainbridge-avenue, Vinstone, Plymouth. Mr. E. Coath Adams, architect, Bedford-chambers, Plymouth. Quantities by Mr. S. W. Haughton, 22, Courtenay-street, Plymouth :—

Palk & Son	£1,632	Wakeham Bros.	£1,390
J. Partridge	1,535	G. B. Turpin	1,360
J. Crockerell	1,463		

[All of Plymouth.]

TENDERS—*Continued on page* 676

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*New Public Elementary School	Stockport Education Committee ..	Not Stated	No date.
*Prop. New Wesley. Methd. Hall, Broadway, Westminst.	The Trustees	Not Stated	No date.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Painting, etc., at Grange Infectious Hospital, Earsdon	Tynemouth, etc., Hospitals Comttee.	J. R. McMillan, Inspector of Hospitals, Shiremoor	June 18
Foundations of Contact House at Grange Hospital..	do.	do.	do.
Plumbing, etc.	do.	do.	do.
Piled Bridge, Pier, and Two Abutments	Harrogate Corporation	E. W. Dixon, Engineer, 14, Albert-street, Harrogate	do.
10-ton Compound Steam Road Roller and Scarifier..	Sleaford U.D.C.	J. Clare, Surveyor, Sleaford	do
Pit Wood, etc.	Nixon's Navigation Co., Ltd.	J. L. Herbert, Secretary, Bute Docks, Cardiff	June 20
Manure Concentrator	Warrington Corporation	R. Wilson, Longford Depot, Warrington	do.
Seven Spans, 100 ft.	Bengal & N.W. Ry. Co.	A. Izat, 237, Gresham-house, Old Broad-street, London, E.C.	do.
Switchrooms at Temple Back Electricity Works....	Bristol Electrical Committee	H. Faraday Proctor, City Electrical Engineer, Temple Back, Bristol	do.
Tar Washer, Washer, Scrubber, etc.	Mountain Ash U.D.C.	Corbet Woodall & Son, Eng., Palace-chamb., Bridge-st., Westminst.	do.
Purifier, Centre Valve, etc., Penrhiwceiber	do.	do.	do.
Villa Residence, Carr-lane, Acomb, York	Mr. W. M. Holmes	M. W. Lewis, Architect, 194, Bishopthorpe-road, York	do.
Caretaker's Dwelling, etc., Bredbury Sewage Works	Bredbury and Romily U.D.C.	Council Offices, School Brow, Bredbury	do.
10-ton Weighbridge at Destructor Works	Chorley Corporation	W. Leigh, Borough Surveyor, Town Hall, Leigh	do.
Shop Premises, Jameson-street, etc., Hull	Mr. W. E. Welton	Gelder & Kitchen, Architects, 76, Lowgate, Hull	do.
Painting, etc., at Infantry Barracks, York	.....	Royal Engineer Office, Fishergate, York	do.
Paving in Mare-street, Hackney	The L.C.C.	M. Fitzmaurice, Engineer, County Hall, Spring-gardens	June 21
Extension of Sewers in Bracknell	Easthampstead R.D.C.	C. B. Wilson, Clerk, Bracknell	do.
Wiring, etc., Technical College, Barking-road	East Ham U.D.C.	W. C. Ullmann, M.Inst.C.E., Nelson-street, East Ham, E.	do.
Main Drainage, Burford	Witney R.D.C.	H. H. Humphreys, Engineer, 28, Victoria-street, Westminster	do.
Repairs to Van at Workhouse	Brentford Guardians	Master of the Workhouse	do.
New Vans	do.	do.	do.
Stores, Iron, Timber, etc.	Trimdon Coal Co.	Deaf Hill Colliery, Trimdon-grange, R.S.O.	do.
Painting, etc., Technical & Intermediate Day Schools	Bootle Corporation	Borough Engineer's Office, Town Hall, Bootle	do.
House, South Brent	.....	Post Office, Aish	do.
Supplies	Chelmsford Corporation	Borough Surveyor, 16, London-road, Chelmsford	do.
20,000 Jarrah and Karri Wood Blocks	Southampton Corporation	J. A. Crowther, Borough Engineer, Southampton	do.
*Road-making and Paving Works	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
Laying-out Land at Osmotherley for Cemetery	Northallerton R.D.C.	W. Fowle, Clerk, Northallerton	June 22
Masonry Reservoir, Chudleigh Water Supply	Newton Abbott R.D.C.	S. Segar, Engineer, Union-street, Newton Abbott	do.
Distempering, etc., of Workhouse Hospital, Knutsford	Bucklow Guardians	R. J. McBeath, Architect, Birnam House, Sale	do.
Paving with Creosoted Deal Blocks	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham	do.
Shedding, etc., Sandbach	Cheshire Agricultural Society	T. A. Beckett, Secretary, St. Werburgh-chambers, Chester	do.
Shops, Greaves-road, Lancaster	Lancaster & Skerton Co-opera. Soc.	Austin & Paley, Architects, Lancaster	do.
Premises, Chirk, Denbigh	Chirk Green Co-operative Society	J. Powell, Secretary	do.
St. Anne's Church, Brislington	Vicar and Committee	H. M. Bennett, Architect, Liverpool-chmbrs., 36, Corn-st., Bristol	do.
600 yds. 4 in. Cast-Iron Water Mains	Epsom U.D.C.	W. Young, Manager, Waterworks	do.
9 in., 6 in., and 4 in. Cast-Iron Pipes and Specials..	do.	E. R. Capon, Surveyor to Council	do.
*New Chapel in Windsor-road, Slough	Slough Baptist Church Committee	Thomas Brown, 4 and 5, Warwick-court, Gray's Inn, W.C.	do.
Carriageways, etc., W. Allotment Streets, Long Benton	Tynemouth R.D.C.	A. S. Dinning, 21, Ellison-place, Newcastle-on-Tyne	June 23
Painting Bandstand in Bank Park	Warrington Corporation	T. Longdin, Borough Engineer, Town Hall, Warrington	do.
Two Ministers' Residences (Blackhill and Consett)..	Shotley Bridge Prim. Method. Trust.	Rev. F. Pickering, 10, West-view, Blackhill	do.
Motor-driven Tower Wagon	Cardiff Electric Tramway Departm't	A. Ellis, Borough Electrical Engineer, the Hayes, Cardiff	do.
Stores	Belfast Gas Committee	At the Gasworks	do.
*Extension of Isolation Hospital	Ealing Town Council	Borough Engineer, Town Hall, Ealing, W.	do.
560 yds. Ornamental Wrought Iron Railing	Rochdale Corporation	S. S. Platt, Borough Engineer, Town Hall, Rochdale	June 24
Six Wrought-Iron Gates, Falinge Park	do.	do.	do.
Wheelbarrows, Picks, Shovels, Spades, etc.	Guildford R.D.C.	Council's Surveyor, Commercial-road, Guildford	do.
Oils and Sundries for Steam Rollers	do.	do.	do.
Heating May-street Church, Belfast	.....	J. Williamson, 46, Royal-avenue, Belfast	do.
Supplies	Halifax Gasworks Committee	J. Wilkinson, Engineer, Gasworks, Halifax	do.
1,000 Tons of Broken Granite	St. Neots U.D.C.	J. Edey, Surveyor, South-street, St. Neots, Hunts	do.
Fifty Tons of Broken Iron Slag	do.	do.	do.
Private Street Works	Dorchester Town Council	G. J. Hunt, Borough Engineer, Guildhall-chambers, Dorchester	do.
New Street, Stoneferry	Hull Corporation	A. E. White, City Engineer, Town Hall, Hull	do.
Artisans' Dwellings, Hanbury-lane, Dublin	.....	G. T. Moore, Engineer and Architect, 1 & 2, Foster-place, Dublin	do.
*New Coastguard Buildings	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
Town Clock Tower, Fore-street	Redruth Coronation Committee	T. W. Joyce, Surveyor, Council Offices, Redruth	June 25
Painter Work at Various Schools	Edinburgh School Board	Mr. Carfrae, 3, Queen-street, Edinburgh	do.
Painting Sessions Court	Birkenhead Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead	do.
Painting 725 Street Lamp Columns	Crewe Electric Lighting Committee	H. H. Denton, Corporation Electricity Works, Crewe	do.
Fencing Around Electricity Works	do.	do.	do.
Bridge over Burn of Arndilly, Boharm	Banffshire County Council	R. Davidson, Road Surveyor, Dufftown	do.
Cleaning and Painting Schools	Gateshead Education Committee	E. J. Harding, Secretary, Education Offices, Gateshead	do.
Premises, Fish Docks, Grimsby	Gt. Grimsby Albion Steam Fishing Co.	H. C. Scaping, Architect, Grimsby	do.
3,000 yds. of 4 in. c.i. Pipes	Bury and District Water Board	J. Cartwright, Engin'r, Peel-chambers, Market-place, Bury, Lancs.	do.
2,000 yds. of 6 in. c.i. Pipes	do.	do.	do.
Additions to Schoolhouse, Maggieknockater	.....	C. C. Doig, Architect, Elgin	do.
Alterations to School Buildings, Maggieknockater	.....	do.	do.
Alterations to School Buildings, Boharm School....	.....	do.	do.
Dwarf Wall, Cathays Park	Cardiff Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff	do.
Seventy-nine Houses at Mountain Ash	Bryngolwg Cottage Co., Ltd.	T. W. Millar, Architect and Surveyor, Mountain Ash	do.
Sewage Farm Extension (Contract No. 3)	Burton-on-Trent Corporation	G. T. Lynam, Borough Engineer, Town Hall	June 27
Taking Down and Refixing Oak Pale Fence, etc....	Surbiton U.D.C.	S. Mather, Surveyor to Council, Surbiton	do.
Lining Filter Bed at Sewage Works with Concrete ..	Malden and Coombe U.D.C.	T. B. Simmons, C.E., Cambridge-road, New Malden	do.
151 yds. of Iron Fencing, Dartford-road, Sevenoaks	Sevenoaks U.D.C.	S. Towlson, Surveyor, Council Offices, Sevenoaks	do.
151 yds. of Iron Rail Fence, with Oak Posts	do.	do.	do.
Road Metal	do.	do.	do.
Carting Materials, Romsey	Southampton County Council	W. J. Taylor, County Surveyor, The Castle, Winchester	do.
Parkhead District Library	Glasgow Corporation	J. R. Rhind, Architect, 67, Hope-street, Glasgow	do.
Kerbing, etc., and Making Good Five Streets	Otley U.D.C.	J. E. Sharpe, Engineer, Council Offices, Otley	do.
Paving Six Back Streets	do.	do.	do.
725 tons of Surface Dug Flints	Burgess Hill U.D.C.	A. F. Hardwick, Clerk, Burgess Hill	do.
425 tons of Dug Flints	do.	do.	do.
300 tons of 1½ in. Granite	do.	do.	do.
Class-room, West Dock-avenue Council School	Hull Education Committee	City Architect, Town Hall, Hull	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by —	Tenders to be delivered
Paving, etc. of Streets at Pelaw	Felling U.D.C.	Surveyor, Council Buildings, Felling, R.S.O.	June 27
Road Materials	East Stonehouse U.D.C.	F. A. Wiblin, Surveyor, Town Hall, East Stonehouse	do.
Electric Light at Schools, Great Yarmouth	Education Committee	J. M. Cockrill, A.R.I.B.A., Town Hall, Great Yarmouth	do.
Cleaning, etc., Council Schools	Bolton Education Committee	F. Wilkinson, Education Offices, Nelson-square, Bolton	do.
Cleaning, etc., Voluntary Schools	do.	do.	do.
Repairs at Workhouse, Gravelly Hill	Aston Guardians	Clerk of Works at Workhouse	do.
Refuse Destructor Buildings, etc.	Worthing Corporation	F. Roberts, Borough Engineer, Municipal Offices, Worthing	June 28
4½ miles of Brick Sewer (Deptford to Plumstead)	The L.C.C.	M. Fitzmaurice, Engineer, County Hall, Spring-gardens, S.W.	do.
Extension of Shunters' Cabin at Pengam	G.W. Ry. Co.	Office of Engineer, Newport Station, Mon.	do.
New Offices at Swansea-street, Cardiff	do.	do.	do.
Alterations, etc., to Tabernacle Con. Ch., Abertillery	.....	Habershon, Fawckner, & Co., Architects, 41, High-st., Newport	do.
Loopline at Grafton, near Savernake	G.W. Ry. Co.	Engineer, Paddington Station, London	do.
*Additions, Infectious Diseases Hosp., Mill-lane, Liscard	Wallasey U.D.C.	District Engineer and Surveyor, Public Offices, Egremont, Cheshire	do.
Stone Bridge on the Usk at Kemeys Commander	Monmouthshire County Council	W. Tanner, F.S.I., County Surveyor, Newport	June 29
447 yds. (12 in. by 6 in.) Norway Granite Kerbing	Braintree U.D.C.	H. H. Nankivell, Surveyor, Vestry Hall, Braintree	do.
447 yds. Scored Brick Channeling	do.	do.	do.
Screw-cutting Lathe and Electric Motor	Edinburgh and Leith Fire Brigade	The Firemaster	do.
Labourer's Cottage at Shrubs	North Dublin R.D.C.	J. O'Neill, Clerk, North Brunswick-street, Dublin	do.
Three Cottages at Tonlegee	do.	do.	do.
Two Cottages at Baldoyle	do.	do.	do.
Two Cottages at Newtown	do.	do.	do.
Three Cottages at Finglas East	do.	do.	do.
*Clean. & Paint., etc., Venetian Blinds, Homerton Infirm.	Hackney Guardians	Clerk's Office, Sidney-road, Homerton, N.E.	do.
*Clean., Distempering, & Paint., Homerton Infirmary	do.	do.	do.
*Twenty-two Cottages, Leavesden Asylum	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
*Road-making and Tar Paving, Millfield Homes	do.	do.	do.
*Repairs to Tar Paving, Park Hospl., Hither Green, S.E.	do.	do.	do.
*Surf. Water Drainage & Repairs to Tar Paving, Sutton	do.	do.	do.
Lifeboat-house, Throston, Hartlepool	National Lifeboat Institution	W. T. Douglass, Engineer, 15, Victoria-street, Westminster	June 30
Making-up Napleton-road	Ramsgate Town Council	T. G. Taylor, Borough Surveyor, Albion House, Ramsgate	do.
2,000 yds. 12-in. c.i. Pipes	Kettering U.D.C	T. Reader Smith, Engineer, Market-place, Kettering	do.
Public Washhouse, Springfield-street, Old Swan	Liverpool Corporation	W. R. Court, Engineer, Municipal Offices, Liverpool	do.
Pull'g D'n Old Hotel de Ville, etc., Infirmary-st. Leeds	.....	T. Winn & Sons, Architects, Leeds	do.
Paving Streets	Gateshead Corporation	J. Bower, Borough Engineer, Town Hall, Gateshead	do.
1,000 sq. yds. Cement Concrete Foot Pavements, etc.	Burgh of Duns	J. Miller, Town Clerk, Duns	do.
*Erection of Public Library, Herne Hill	Lambeth Borough Council	H. Wakeford & Sons, 267, Clapham-road, S.W.	do.
Town House, Burgh of Cowdenheath	Burgh Commissioners	T. Hyslop Ure, Architect, 43, Carnegie-street, Dunfermline	July 1
Repairing Transept and South Wall, Ashwater Church	.....	Rectory, Ashwater, Devon	do.
Works at Portora Royal School, Enniskillen	.....	At the School	do.
*New Coastguard Build'gs, Cliffe Creek, nr. Gravesend	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
*New Coastguard Buildings at Boscastle	do.	Superintending Civil Engineer, H.M. Dockyard, Devonport	do.
*Supply of Materials, &c.	Ealing Town Council	Borough Surveyor, Town Hall, Ealing, W.	do.
Alterations, etc., at Workhouse, Old Windsor	Windsor Guardians	Edgington & Summerbell, Architects, 7, Park-street, Windsor	July 2
Painting Gates and Railings, Carlow Court House	Carlow County Council	Secretary, Court-house, Carlow, Ireland	do.
Gas Piping and Fittings at Carlow Court House	do.	do.	do.
Making Red Lion-lane, Little Sutton	Wirral R.D.C.	T. Davies, 33, Kingsland-road, Birkenhead	do.
230 yds. of Pipe Sewers, etc., at Power Station Site	Handsworth U.D.C.	H. Richardson, Eng. & Sur., Council H'se, Handsworth, Birming'm	July 4
Public Library, Gainsborough	U.D.C.	Scorer & Gamble, Architects, Bank-street-chambers, Lincoln	do.
Kerbing, Mill-lane, Chadwell Heath	Romford R.D.C.	G. Lapwood, Highway Surveyor, Victoria-chambers, Romford	do.
Kerbing, North-street, Hornchurch	do.	do.	do.
*Roads and Drainage, Napsbury Asy., nr. St. Albans	Middlesex County Council	Young & Brown, 104, High Holborn, W.C.	do.
*R'lway Sid'g, Br'ch Line, etc. do. do.	do.	do.	do.
*Fencing, Gates, etc. do. do.	do.	do.	do.
Weighbridge at Workhouse, Old Windsor	Windsor Guardians	At the Workhouse, Old Windsor	July 5
2 Cott's, Lime, etc., Stores, etc., Dedworth-rd., Clewer	New Windsor Town Council	E. A. Stickland, Borough Surveyor, Alma-road, Windsor	do.
Sewers and Surface Water Drains	Dover Town Council	H. E. Stilgoe, Borough Engineer, Maison Dieu House, Dover	do.
*Tar Paving Works to Schools	Leyton Education Committee	W. Jacques, Architect, 2, Fen-court, Fenchurch-street, E.C.	do.
*Clean., Paint., Repairs, & Improvements to Schools	do.	do.	do.
*School Buildings, Reading	Reading Education Authority	S. S. Stallwood, Architect, Market-place, Reading	do.
Coal Breaking and Elevating Plant	Oldham Gasworks Committee	A. Andrew, General Manager	July 6
Inclined and Horizontal Retorts	do.	do.	do.
Stoking Machinery	do.	do.	do.
Lifeboat House and Slipway, Tenby	National Lifeboat Institution	W. T. Douglass, Engr. and Archt., 15, Victoria-st., Westminster	do.
1,700 yds. of Kentish Flints	Clacton U.D.C.	A. R. Robinson, Surveyor, Town Hall, Clacton-on-Sea	do.
2,000 tons of Guernsey Granite	Wanstead U.D.C.	C. H. Bressey, Surveyor, Council Offices, Wanstead	do.
*Reconstruction, etc., to Church & Schools, Dorchester	Trustees	W. E. Dibben, Secretary, 24, South-street, Dorchester	do.
*Painting at Infirmary, Brook-street, S.E.	Lambeth Guardians	Guardians' Offices, Brook-street, Kennington-road, S.E.	do.
*Decorative Repairs at Infirmary, East Dulwich	Southwark Guardians	G. D. Stevenson, Architect, 13 & 14, King-street, E.C.	July
*Collection and Storage of Rainwater, Stifford, Essex	Stepney Guardians	F. R. Smith, 13, Victoria-street, S.W.	do.
Alteration, etc., of St. Mary's Church, Cardigan	.....	J. Evans, Auctioneer, Cardigan	July 9
Three Three-Ton Electric Travelling Jib Cranes	The L.C.C.	County Hall, Spring-gardens, S.W.	July 12
Two Electric Locomotives at Greenwich Wharf	do.	do.	do.
*Fire Brigade Hose Carriage	Dundee Town Council	J. S. Weir, City Firemaster, Dundee	do.
*Extension to Boiler House at Electricity Works	Wimbledon U.D.C.	Council's Engineer, Broadway, Wimbledon	July 14
Machinery, Trowbridge Sewage Works	Trowbridge U.D.C.	W. H. Stanley, Engineer, Market House-chambers, Trowbridge	July 18
Two 32-ton Electric Coaling Hoists, Clydebank	Clyde Navigation Trustees	G. H. Baxter, Mechanical Engineer, 16, Robertson-street, Glasgow	July 25
Six Miles of 14-in. c.i. Water Pipes, Conisbro'	Doncaster Corporation	W. H. R. Crabtree, C.E., Mansion House, Doncaster	No date.
Hall, Penydarran, Merthyr	Welsh Presbyt. Forward Movement	Habershon, Fawckner, & Co., Architects, 14, Pearl-street, Cardiff	do.
500 tons of Road Metal	Bridge of Allan Town Council	Henderson, Surveyor, Bridge of Allan	do.
Additions to Stadhampton School, Wellingford	.....	Tollit & Lee, Architects, 7, St. Aldate's-street, Oxford	do.
Brickwork for Four Houses	.....	Pinkney, Haughton-road, Darlington	do.
Rebuilding of Cartshed	.....	G. Bolland, Church View, Hunton, Bedale	do.
Clearing Topwood from 20 Acres of Land at Dimsdale	.....	T. C. Wyse, Land Agent, Darlington	do.
500 tons of Broken Granite	West Suffolk County Council	A. Ainsworth Hunt, County Surveyor, Sudbury, Suffolk	do.
Boundary Wall, St. James's Park Estate, Harrogate	.....	J. Ellis Marten, Architect, Prince's-chambers, Harrogate	do.
308 yds. of 9-in. Sewer at Bates' Cottages	Earsdon U.D.C.	J. R. MacMillen, Council Office, Shiremoor	do.
Sinking Two Shafts	.....	W. D. Wadsworth, 1, Devonshire-street, Chesterfield	do.
Taking Down Premises on Kingsdown-parade	Bristol Co-operative Society	La Trobe & Weston, Architects, 20, Clare-street, Bristol	do.
Shops, Offices, etc., Jameson-street, Hull	Mr. E. Cooke	Freeman, Son, & Gaskell, Architects, 11, Carr-lane, Hull	do.
*Erection of Chapel, Totland Bay, Isle of Wight	The Trustees	S. E. Tomkins, Architect, Newport, Isle of Wight	do.
*Erection of Schools, Newport-road, Aldershot	Aldershot Urban Council	Council's Surveyor, Council Offices, Aldershot	do.
*Painting, etc., Works, Infantry Barracks, York	War Department	Royal Engineer's Office, Fishergate, York	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Building Surveyor	Derbyshire Education Committee	Not Stated	June 30
*Chief Assistant	Devon C.C. Education Committee	200*l.* per annum	do.
*Clerks of Works (Two)	do.	100*l.* per annum	do.
*Quantity Surveyor	Acton U.D.C.	(See Advertisement this Issue)	July 4
*Assistant Civil Engineers	Civil Service Commissioners	Not Stated	July 7
*Teacher of Building Construction	Middlesex Education Committee	10s. per Lesson	No date.
*Second Assistant to Superintendent of Buildings	British Central Africa Protectorate	250*l.*, etc.	do.

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TENDERS.—*Continued from page 673.*

PLYMSTOCK.—For laying 9-in. sewer pipes and constructing tanks and outfall works at Lower Hooe, for the Plympton St. Mary Rural District Council. Mr. F. A. Clark, engineer, 83, Old Town-street, Plymouth :—
Steer & Pearce, 8, Carfrae-terrace, Plymouth* £1,047

PORTMADOC.—For repair and maintenance of the main roads in Merioneth other than those in urban districts, for the County Council. Mr. E. Vaughton, C.E., Arthog, Dolgelly :—

	Thomas & Lloyd.	Per annum.
If contract let for three years	£5.393	3 4
If contract let for five years	5,000	0 0
	L. Sommerfeld.	
For three or five years, at the option of the County Council	8,971	6 0
	Davies Bros., Barmouth.*	
For five years	4,603	15 0

RAMSGATE.—For supplying 2,000 feet of granite channel, for the Corporation. Mr. T. G. Taylor, Borough Engineer, Ramsgate :—

G. A. Watson & Son, Ltd.	1 4½	per ft.
Goodchild & Co.	1 1	,,
Griffiths & Co.	1 1	,,
Brookes, Ltd.	1 1	,,
E. J. Van Praagh & Co.	1 0⅞	,,
Bichfeldt & Co.	1 0¾	,,
A. & F. Manuell, London*	1 0½	,,
J. Gordon & Son	1 0½	,,

RAMSGATE.—For making-up passage at rear of Winstanley-crescent and Alexandra-road, for the Corporation. Mr. T. G. Taylor, Borough Engineer, Albion House, Ramsgate ;—

Tobin & Co. ..	£263 18 6	W. Wilson,	
G. Home.....	223 10 6	Ramsgate*..	£170 0 0
J. K. Bugden	202 10 0		

RYDE (Isle of Wight). — For reconstruction of portions of promenade pier, for Ryde Pier Co. Mr. T. R. Saunders, C.E., Belgrave-chambers, Ventnor. Quanitties by engineer :—

J. Shelbourne & Co.	£13,220 0 0
London and Tilbury Lighterage Contracting and Dredging Co.	10,925 6 1
J. Cochrane & Sons	8,730 0 0
A. Fasey & Son	8,567 10 3
F. Bevis	8,495 0 0
Mayoh & Haley	7,845 9 2
W. Rigby	7,487 0 0
W. A. Baker & Co., Ltd.	7,443 5 0
A. Thorne.....	7,381 13 0
F. Grace, 45, Avenue-road, Southampton*	7,035 0 0

SEVEN KINGS.—For Seven Kings U.M.F, church and school. Messrs. George Baines and R. Palmer Baines, architects, 5, Clement's-inn, Strand, London, W.C. :—

	A.	B.
H. J. Carter.....	£3,541	£564 0 0‡
J. W. Jerram	3,536	677 0 0
F. Gough & Co.	3,400	664 0 0
F. Bull	3,297	574 0 0
G. J. Hosking	3,223	557 0 0
S. J. Scott	3,212	556 0 0
Sands, Palmer, & Co.....	3,117	602 2 0
F. J. Coxhead	3,112	597 0 0
Turtle & Appleton	3,130	525 0 0
Battley, Sons, & Holness	3,097	528 0 0
F. & A. Willmott	2,994	511 0 0
C. North, Grove Works, Manbey Park, Stratford*	2,922	521 0 0

‡ Plus £150 for seating.
[Architects' estimate, £3,641].

SOOTHILL NETHER.—For erecting retaining walls, etc., in connexion with the High-road improvement, for the District Council. Mr. J. H. Ward, surveyor ;—
J. Pickersgill, Street-side, Ossett..... £216 6 0

SOUTHAMPTON.—For supply and erection of softening plant at Otterbourne Waterworks, for the Corporation. Mr. William Matthews, waterworks engineer, Southampton :—

J. Cochrane	£3,125
J. Simpson & Co., Ltd., Grosvenor-road, London*	2,762

ST. MARY CRAY (Kent).—For the erection of a pair of cottages at Sheepcote. Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington :—

R. A. Lowe	£778 0	A. Pannett*	£495 10
T. Knight	609 0	J. Smith‡	389 0
Somerford & Son	572 0		

‡ Withdrawn.

STONE.—For new tramp wards at workhouse, for the Guardians of the Poor of Stone Union. Messrs. Jones & Hilton, architects, Stone. Quantities by the architects :—

W. Grant & Son	£1,425 0 0	T. Godwin ..	£1,313 0 0
W. Whitfield	1,420 0 0	J. Wilcox ..	1,298 18 2
G. Ellis	1,389 0 0	T. Moss	1,228 11 0
J. Bagnall ..	1,359 0 0	J. Charlesworth, Wolstanton* ..	1,189 0 0
W. Cooke....	1,346 0 0		
Tomkinson & Betteley ..	1,327 0 0		

TEIGNMOUTH.—For alterations and additions to the Wesleyan Methodist Chapel, for the Trustees. Mr. A. J. Cornelius, architect, Truro :—

R. F. Yeo & Sons.....	£234 0 0	A. Sampson ..	£124 15 0
E. Andrews ..	125 0 0	J. J. Hayman, Teignmouth*	123 0 0

TROWBRIDGE.—For paving and channelling works, for the Urban District Council. Mr. H. G. Nicholson-Lailey, Town Surveyor, Town Hall, Trowbridge :—

Asphaltes United	£504 10 0	S. T. Clothier..	£375 12 6
T. Gibbons	459 2 6	S. Ambrose ..	362 10 10
Grounds & Newton	438 0 0	E. Ireland, Morecambe*	354 11 8
North of England Asphalte Co.	400 17 6	Free Bros.....	328 15 0
		T. Free & Co...	281 5 0

TWICKENHAM.—For forming, levelling, kerbing, channelling, paving, etc., part of Whitton-rd., for the Urban District Council. Mr. F. W. Pearce, surveyor, Town Hall, Twickenham :—

Kavanagh & Co.	£1,192 0	T. Adams	£995 0
Parry & Co.	1,080 0	E. A. Sparksman	932 0
A. B. Champness	1,072 7	Mowlem & Co., Westminster*.	915 0
Wimpey & Co...	999 0		

WOLVERHAMPTON.—For addition to car-shed in Cleveland-road, for the Tramways Committee. Mr. G. Green, Borough Engineer, Town Hall, Wolverhampton. Quantities by Mr. Vale, Wolverhampton :—
H. Willcock & Co., Wolverhampton* .. £2,587

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The Builder.

VOL. LXXXVI.—No. 3203. JUNE 25, 1904.

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New Offices of the Liverpool, London and Globe Insurance Co..... Mr. J. Macvicar Anderson, F.R.I.B.A., Architect.

The Ancient Church of Asfeld, Ardennes :—

Perspective View
Side Elevation
Longitudinal Section
} ..... From drawings by M. J. E. Allard.

Dalston Hall, Cumberland ..... Mr. J. W. Benwell, A.R.I.B.A., Architect.

Elks Club, Colorado Springs, U.S.A. ..... Mr. T. Maclaren, A.R.I.B.A., Architect.

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The House of Lords on the Chantrey Bequest.

THE subject of the Chantrey bequest came before the consideration of the House of Lords on Tuesday last, on a resolution moved by Lord Lytton for the appointment of a Select Committee of the House to enquire into the matter, and, if necessary, to make recommendations. The motion was agreed to, apparently unanimously, though not without considerable difference among various speakers as to the general view of the subject.

We have already referred to Lord Lytton's recent article on the subject in the *National Review* as being logical and practically unanswerable, though we thought at the time that it was somewhat too polemical; and the tone and temper of his speech was more decisively so. He damaged his own case, as others of the Academy's critics have done, by exaggeration. To assert that the collection of pictures already purchased is "a mere by-word and a mockery," when the collection includes such works as Sir E. Poynter's "Visit to Æsculapius" and Brett's "Britannia's Realm," each of which might fairly be claimed as the finest picture its author has ever painted, is absurd and exaggerated. Still more so is it to assert that Millais' "Speak! Speak!", another of the purchases, is "the worst picture he ever painted." Even the worst of Millais is worth, for that matter, more than the best of many other painters; but to call that remarkable work his worst is mere temper or prejudice, and such assertions will not strengthen the hands of the Select Committee. Then we very much doubt whether the remark that no pictures by deceased artists had been bought is to the point. It is perhaps the one thing that is not made absolutely clear in Chantrey's will, whether he did or did not contemplate the purchase of works by deceased artists, as he did not in so many words prohibit it; but it seems to us unquestionable, from the general wording of the bequest, that what he contemplated was the purchase of new works of exceptional merit as an encouragement to English art; the object, as Lord Wemyss rightly said, was not to form a gallery but to encourage and stimulate English art; and with that object in his mind, no doubt the idea of the purchase of works by deceased artists was so far out of his thoughts that he did not see the necessity of even referring to it. We do not think that any logical and unprejudiced person could read the terms of his bequest without recognising that as their implicit and necessary intent; and therefore that part of Lord Lytton's argument is of no value. Nor can we doubt that Chantrey contemplated, as part of the use of the fund, the purchase of exceptionally good works by hitherto unknown artists. One or two at any rate of the small works contemptuously referred to by Lord Lytton would come under that category, and are purchases much more justifiable than he is aware of. The really unjustifiable selections are not so much among the works of artists unknown or little known before, as among the commonplace and uninteresting works of men well known—as mediocrities; some of them Academicians. It is among such that the real and formidable mistakes have been made.

Lord Lytton's ideas as to what the proposed Committee could accomplish are reasonable enough. It could secure from the Academy, he suggested, "some answer to the charges brought forward and some explanation of the methods hitherto adopted." And if it found the charges well founded, it could make recommendations which the Academy might be willing to carry out, and so put an end to misunderstandings. In fact, the Academy could easily have anticipated and rendered unnecessary the functions of the proposed Committee if they had chosen to do so. That any one should think the appointment of the Committee a necessity is entirely the fault of the Academy themselves. Individual Academicians, many of them, are most delightful and most reasonable people. But the Academy in its corporate capacity is one of the most self-opinionated bodies in existence. It will explain nothing and answer nothing, and treats all outside criticism as ignorant impertinence; and it is not surprising if public feeling is at last roused to some irritation at this defiant attitude. Lord Wemyss, in a speech intended to justify the Academy, said that so far from being opposed to an enquiry the Academy courted it. If so, why have they so obstinately refused to recognise any of the criticism directed against them, or to give any explanation of their action? This attitude of "courting enquiry" seems rather like making a virtue of what has at last become a necessity.

Lord Davey, who spoke as one of the present Chantrey Trustees, after repeat-

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ing the statement that the Academy courted enquiry, also declared emphatically that the Academy were fulfilling the terms of the bequest in encouraging British art by purchasing able works by young and unknown artists. As already observed, we believe that was one of Chantrey's objects; shadowed forth in the terms of the bequest. But (only to quote two or three examples) it cannot be said that Mr. Pettie or Mr. Yeames were young and unknown artists, while it must be obvious that the works by them which were purchased were, to say the least, of very mediocre merit, while Calderon's "Elizabeth of Hungary," another purchase, is ridiculous and even worse.

Lord Windsor, in a well-considered reply on the part of the Government, admitted that a *primâ facie* case for enquiry was made out, and was of opinion that a Committee appointed by the House would make it perfectly clear that the Academy, in confining their purchases to pictures exhibited at their own annual exhibitions, were "taking too narrow a view of their duty and placing an unnecessary limit on their freedom of choice." That is at all events clear to every one. Reasoning from results, one would be inclined to say that there has been something more than that to complain of; that the Chantrey Bequest has been practically regarded as a kind of *bonne bouche* to be doled out to Academicians in rotation; A.'s picture being purchased one year, B.'s the next, C.'s the next; and so on in friendly rotation. If that has not been intended, the Academy have been unfortunate enough to give a good deal of excuse for such a supposition; and whether intentional or not, the result is obviously wrong and contrary to Chantrey's intention. In other words, if A.'s pictures were decidedly better every year than B.'s or C.'s, they ought to have been purchased every year, without any consideration of making things pleasant all round, which was certainly no part of Chantrey's object.

One curious feature in the debate may be noted—that neither those who attacked nor those who to some extent defended the Academy, seem to have had any perception of what is really the most serious fault in their administration of the Chantrey fund, viz.: their almost entire neglect of sculpture. This year they have shown signs of awaking to the fact, and have purchased an important piece of sculpture, though hardly one of the highest rank; but sculpture has been very much neglected. This is the more to be deprecated, because sculpture is one of the arts which is least understood and is most in want of encouragement in England; and the case for sculpture is certainly strengthened by the consideration that the founder of the bequest was himself an eminent sculptor. In this respect, even if in no other, the fund has been ill administered; and the mistake is only too characteristic of a body of whom the numerical majority are painters, and which is in fact not so much an "Academy of Arts" as an Academy of Painting.

VESTRY OFFICES, MEERSBROOK, SHEFFIELD.—New vestry offices, near Meersbrook Park, Sheffield, are to be opened shortly. The building has been designed by Mr. Joseph Norton, architect and surveyor, of Sheffield.

THE KINGSWAY UNDERGROUND TRAMWAY.

CONCURRENTLY with the formation of the new thoroughfares which are destined to connect Holborn with the Strand, considerable progress has been made in the construction of the shallow subway along which will be laid the underground tramway from the existing lines at Theobald's-road to the Strand. Although the temporary terminus of the new route will be at the latter point, the ultimate intention of the London County Council, subject to Parliamentary sanction, is to continue the line *viâ* the Victoria Embankment and Westminster Bridge to form a direct connecting link between the northern and southern tramway systems of the metropolis. No useful purpose would be served by discussing the action of Parliament in refusing to accede to the wishes of the Council in this respect, but we may remark that those who are qualified to judge of such matters aver that it is impossible at the present time to convince either House that a tramway line of any kind would be a desirable adjunct to the Embankment. Moreover, the Commissioner of Police has openly expressed the opinion that the presence of tramcars on Westminster Bridge would cause great obstruction and constitute a source of danger to the public. For ourselves, we are convinced that the scheme of the Council would be of immense service to the community, and that no valid reason exists to interfere with its realisation.

The new route is to start at Theobald's-road, where a junction will be made with the existing lines by means of an incline in open cutting, with a gradient of 1 in 10 to the south end of Kingsgate-street, and for a short distance in two parallel tunnels. The lines will pass below Holborn in two cast-iron tubes driven by the shield system, so that no interference may be caused to traffic. South of the tubes the double tunnel is to be continued for a short distance, and thereafter the subway will consist of a single opening, now being constructed in open cut. Passenger stations are in course of construction at Queen-street, at the junction of Kingsway and Aldwych, and at the southern terminus of the line. The tramway is designed on the conduit system, and will be a double track line throughout. One very unfortunate mistake has been made by the Council, for which we scarcely think their professional advisers can be responsible. We refer to the fact that the height of the new subway is 3 ft. 6 in. less than that necessary for the accommodation of double-decked cars, such as are employed on all other metropolitan lines. It is a matter of opinion whether single or double-decked cars are the more desirable, but as the latter have been adopted elsewhere by the Council, it follows that passengers will have to change from one car to another at Theobald's-road, unless all vehicles running to that point are in future to be of the single-decked type. No doubt the cost of the additional depth would have been considerable, although small in proportion to the total expenditure; and further the advantage of the deeper subway would have been emphasised on the ultimate extension of the new route to the southern tramway system, where all the cars are double-decked.

In addition to the main subway, smaller subways are now under construction for the accommodation of gas and water pipes and other conduits. The concrete and mortar used throughout the works are made with Portland cement. No application appears to have been made of concrete-steel, by which considerable saving might have been effected. The whole of the underground work is lined with a layer of asphalt, ¾ in. thick, as a protection against water.

Operations have been somewhat delayed owing to the fragmentary manner in which it was necessary to conduct them as property was acquired from time to time. In several places work cannot be commenced or completed until more land has come into the possession of the Council.

Even with the limitations we have pointed out, the new subway will be of great advantage, and should be of much assistance to those upon whom will ultimately devolve the duty of considering the relative merits of different systems of locomotion for the metropolis.

HOLIDAY SKETCHES.

IT was a very happy idea on the part of the President of the Institute to ask for examples of "Holiday Sketches" to illustrate the walls on the occasion of his "At Home" at 9, Conduit-street last week. The result was a very remarkable collection of sketches by a number of well-known architects. Such a collection has hardly been got together in one room before, and it is to be regretted that circumstances did not admit of the drawings remaining there for two or three weeks, so that more people could have had an opportunity of seeing them. This, however, would have interfered with the immediate uses for which the rooms were required, and therefore they only remained up till after Monday night's meeting.

The term "Holiday Sketches" was evidently interpreted rather widely. What was really intended in the invitation, probably, was sketches actually made on a holiday or a sketching tour, which would hardly include some of the elaborately finished drawings exhibited; one was very glad to see these, but the main interest of the collection lay in the slighter drawings which were more obviously holiday work. Most of these, naturally, were of architectural subjects, but these were agreeably diversified by occasional landscape sketches, which showed the architect out of bounds and enjoying the beauties of nature rather than of art. Thus, a sketch by Mr. R. Blomfield labelled "Pershore" was no part of the Abbey architecture, but a charming sketch of the river and the lock. He contributed also a very able sketch of a sculptured figure from Fontainebleau. Mr. Leonard Stokes sent two or three admirable water-colour sketches of landscape, and Mr. J. W. Simpson a couple of small and delicate pencil sketches, one of them a scene in a wood; and Mr. Ernest George, along with

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a large architectural drawing, sent a view of the Aletsche glacier.

Of the numerous and varied drawings of architectural subjects we have only space to notice a few specially. Among the first in the order of hanging Mr. Schultz's sheet of details of ancient Greek fragments was noticeable both for clear and precise drawing and for the admirable manner in which the texture and tints of the marble were conveyed by the brush. Mr. Maurice Adams's "Portico della Gloria, Santiago," in a very different style and medium, was one of the "holiday sketch" type, as, though quite complete in itself, it might have been, and probably was, drawn on the spot; it is a bold pencil drawing in thick strong lines. Mr. Arnold Mitchell's sheet of little pencil sketches, on the same wall of the room, showed what different results may be got with the same medium of execution, the pencil; these also were genuine holiday sketches. Among others in the same group were Mr. A. C. Blomfield's geometrical coloured drawing of a piece of ancient mosaic, and his sketch of part of the decorative work in St. Mark's (this we think has been illustrated in our pages); a coloured geometrical drawing by Mr. Lanchester of part of the Cordova mosque; a perspective washed drawing of the Bargello by Mr. Baggallay; a pencil perspective of Lyddington Bede House by Mr. R. S. Balfour; and geometric coloured drawings of a rood-screen by Mr. Greenslade. In fact, the row of drawings at the lower end of the large room formed almost a kind of epitome of the various methods in which architecture may be sketched and illustrated.

Among the other exhibits were a good many slight pencil sketches by Mr. Caröe, to which in some cases additional value was given by sketch sections of mouldings added. Mr. Aston Webb showed a pencil sketch of a street scene (Rouen?) and two or three water-colour sketches of coast scenes at watering places, of which he has a large collection. Mr. R. D. Wells's slight water-colour sketches were very good, also Mr. Jerdan's in the same medium, free and effective though perhaps a little heavy in colour. M. Phenè Spiers illustrated old houses; Mr. Walter Millard gave us St. Mark's horses; Mr. Alexander Graham some bright water-colour sketches in the Mediterranean; Mr. Guy Dawber two excellent water-colour sketches of part of a Whitby street, and of the stone staircase at Castle Rising. Mr. Flockhart handles water-colour effectively in his interior of cathedrals; Mr. Emerson showed some powerful studies of Hindoo architecture in the same medium; and among the drawings in the back library were a few slight pencil sketches of architecture by Mr. J. Belcher, little more than outline, but admirable in their certainty of line. If we pass over many others, it is from no want of appreciation but of space. It was a most interesting and delightful exhibition.

ADDITION TO CHRIST CHURCH TOWER, WESTMINSTER.—The Bishop of London dedicated the completed tower of Christ Church, Westminster, on the 19th inst. The added portion of the tower has been built from the designs of Mr. G. A. Hall, architect, by Messrs. Trollope and Sons, at a cost of about 2,400*l*. It is in the Early English style.

NOTES.

The Board of Trade *v.* the Local Government Board.

THE recent Report of the Departmental Committee on the functions and organisation of the Board of Trade and of the Local Government Board, and the desultory debate on the same subject last week, were not of much value. Everyone knows that these two "Boards" are now fictions, and that the head of each Department is called respectively the President of the Board of Trade, and of the Local Government Board. What the country will gain by changing these names to those of Minister of Commerce and of Health, and adding two thousand a year to the salary of each Minister, is problematical. A larger salary to the chiefs will not make Consuls stationed abroad more efficient or prompt in the collection of commercial intelligence in foreign countries, or sanitary inspectors more active at home. There will be more uniformity in nomenclature and more truth in the title, but for practical purposes the change will, if carried out, have no value at all. There is, we think, at present something of a craze among officials for copying foreign names and systems. We confess to a partiality, partly antiquarian, for the existing titles, especially as they do not interfere with the work of the Departments; and, as taxpayers, we doubt if the country will get value for higher salaries to parliamentary chiefs.

Private Dwelling Houses.

A CURIOUS point has been raised in the case of Porter *v.* Gibbons and another. The landlord of a dwelling-house was seeking to re-enter the premises under a covenant in the lease which prohibited the tenant from underletting or assigning or to use the premises except as a private dwelling-house. The defendant admitted that certain cousins and friends had stayed in the house, contributing something to the expenses of the house. One visitor had remained some time, paying as much as two guineas a week. The Court, however, held that the right of re-entry was not enforceable under the covenant, since in the case of houses let as private dwelling-houses it must be shown that a business was being carried on upon the premises, whereas there was no evidence in this case that the defendant had made any profit or attempted to make profits in admitting relatives and friends on the condition of their contributing to the expenses. An attempt to make profits would appear very difficult of proof, but since these covenants are capable of being used very vexatiously, it is well they should not be too easily enforced.

The Woolwich Tunnel Scheme.

FOR some years past considerable inconvenience has been caused, not only to the working-classes, but also to tradesmen, shipowners, and the authorities of the Arsenal, by the interruption of the Woolwich ferry service, owing to fog and other causes. Taking the average of the last five years, it becomes evident that the service is temporarily stopped by fog on at least twenty-one days in every year, the actual figures ranging from five days to thirty-seven days. As fogs usually occur in the early morning, most of the hardship falls upon men, women, and girls who desire to cross the river to their daily work. Local dissatisfaction has assumed such dimensions that a Bill was promoted in the present session of Parliament with the view of obtaining powers for the construction of a railway beneath the river. Although approved by the inhabitants of Woolwich, this Bill was finally withdrawn by the promoters. The hopes of the inhabitants, on both sides of the river, rest, therefore, on the London County Council, by whom it is now agreed in principle that the time has come for the construction of a foot-tunnel at an estimated cost of 145,000*l*. Although this is a very modest outlay, it was decided at a meeting of the Council this week that the realisation of the scheme should be deferred until after the completion of the Rotherhithe tunnel and the new Vauxhall Bridge. If we may judge by the past history of the latter structure, North and South Woolwich will have to wait several years for their tunnel.

The Safeguarding of Lifts and Hoists.

MUCH valuable information relative to the construction, arrangement, and fencing of lifts and hoists is to be found in a Home Office report recently made by Mr. W. S. Smith. The subject-matter is separated into two main divisions of hoisting apparatus, and each of these is again subdivided for convenience into sections, wherein are considered, respectively, methods of construction and of safeguarding such appliances. Being written by one of the Government Inspectors of Factories, it is natural that this report should be concerned to a very considerable extent with such lifts and hoists as are used in various industries; but the matter presented forms a most useful collection of data, which ought to be in the possession of every architect and building contractor. We may especially direct attention to that part of the report which is devoted to automatic hoist doors, wherein will be found descriptions of the leading types of such devices. Safety-gear locking grips for starting ropes are also discussed in detail, and the report concludes with a *résumé* of the principal causes of hoist accidents and a summary of recommendations for the safe construction, fencing, and working of hoisting machinery. The pamphlet is completed by a series of forty-one plates, each containing an average of four or five diagrams showing details of construction. The report has evidently involved an immense amount of labour, and deserves the careful study of all who are concerned in the manufacture, application, and working of lifting and hoisting machinery.

Polyphase Electric Currents.

AN interesting paper by Mr. Brew, on "Three-Phase Working, with Special Reference to the Dublin System," is contained in Part III. of the *Journal* of the Institution of Electrical Engineers, which has just been issued. It will be remembered

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that the Dublin Corporation, acting on the advice of Mr. Robert Hammond, built an electric generating station on Pigeon House Fort, and connected it with their central distributing station in Fleet Street, a distance of over three miles, by three-core cables suitable for conveying energy by three-phase alternating currents. The novel scheme has proved practically successful, and by using four-core cables as distributors a distinct economy in distributing the electric energy to the consumers has been achieved. The phenomena that Mr. Brew has noted in the working of the system prove that the modern theory of alternating currents is in very close agreement with facts. The "charging" currents of the cables were found to vary widely with the shape of the applied pressure wave, and the frequency of the alternating current in the fourth wire was three times and sometimes nine times that of the currents in the three cores. Mr. Brew's paper contains many suggestions, and gives many data which will be useful to electricians. There is one link in the chain connecting the lamps of the Dublin consumer with the generating station at Pigeon House Fort which we think is very clumsy, and that is the use of three single-phase transformers instead of a three-phase transformer. A three-phase mesh to star transformer can be manufactured, the design of which is theoretically perfect. It is much cheaper and more efficient than using three transformers. A transformer of this type seems exactly suited for the purposes of the Dublin transmission. Engineers are in the habit of settling a question of this type by reference to the opinion of continental electricians, who have had great experience in polyphase working. We would suggest that this is not a question for "authority," but one that can be definitely settled by elementary mathematics.

Barnet Isolation Hospital Competition.

THE reports of the meeting of the Barnet Joint Hospital-Committee in regard to the Barnet Isolation Hospital Competition are amusing reading. We have before referred to the case. The Committee in the first instance repudiated the idea of engaging a professional assessor, as waste of money; they could judge of the plans themselves. They seem very much gratified that, in spite of this, they have got fifty-one sets of plans; but we do not think they will find there is any architect of high standing among these competitors. Having gone over the plans themselves and selected five as the best, some of the Committee seem at the last moment to be nervous about spending public money on their own responsibility only, and suggest that an expert should be engaged to say which is the best of these five, with an apparent proviso that they need not take his advice. Another virtuous member thought that having advertised a competition without an assessor, it would be a breach of faith with the architects to appoint one now! One thing, however, none of them seem to perceive, viz., that it is a mere farce to choose what they think the five best plans themselves, and then call in an assessor to tell them which is the best of those five. If they admit that they cannot settle that for themselves, how do they know that they have selected the best five? No assessor ought to act unless the whole of the drawings are submitted to him; and no assessor whose opinion is worth having would consent to do so.

Dunstanburgh Castle, Northumberland.

THE ruins of Dunstanburgh Castle are comprised within the area of an estate extending over 4,000 acres near Embleton and Alnwick, recently held by the Eyre trustees, which will shortly be offered for sale at auction. The Castle, situated on a headland of basaltic rock to the south of Embleton Bay, was rebuilt as a fortress in 1315-6 under licence granted by Edward II. to Thomas Plantagenet, Earl of Lancaster and Lincoln, a grandson of Henry III. The enceinte, about 10 acres, known as Castle Green, stretches for a distance of some 400 yards from the gate-house on the south-west to the sea-front, where on the edge of the cliff is a massive wall. The great gate-house is flanked by two large towers, semicircular at the base and splayed to the square of the upper story; the towers and gate-house are pierced with lancet windows and cross-loops. The curtain walls, to the south and west, have towers and bastions; on the north side stands Lilburn's tower, square on plan, and having lofty turrets, small lancets, and two small projecting garderobes, one above the other, carried by corbels. The south curtain extends from the gate-house to a cove on the east side of the promontory, where stands Queen Margaret's tower on the foreshore; in that curtain is another rectangular tower guarding a sally-port. To the south of the Castle, of which the situation is very similar to that of its neighbour, Bamburgh Castle, is the deep cavern or chasm in the rock, called the "Rumble Churn." In a survey made for King Henry VIII. by Richard Bellasys and others in February, 1538, the castle is described as being "reuynus and of smalle strengthe." Duns Scotus, the learned Franciscan friar and theologian, was, it is generally believed, a native of Dunstance in Embleton parish; a pele tower, since incorporated in a private residence, long known as Dunstan's Hall or Proctor's Steath, is, reputedly, the place of his birth in or about 1265.

Institute of Painters in Water-colours.

THE present exhibition of the Institute of Painters in Water-colours is really what it professes to be on the title-page of the catalogue—an exhibition of "Studies and Sketches" by the members. It is well sometimes to have exhibitions of sketches as well as those of finished works; sketches in water-colour have their own special interest. The works of contributors are grouped together. Mr. G. C. Haitè comes nearly at the beginning of the list, with a series of eleven studies chiefly in Italy—impressions of colour effect mainly. Of Mr. Aumonier's ten sketches "The Citadel" and "A Green Avenue" are the most characteristic in subject and treatment. Mr. Walter Langley takes us to figure studies, groups of peasants or fishermen; "Interesting News" and "The Greeting" are the best of a very interesting set. Mr. Sainton exhibits nine silver-point drawings of fairies and other figures in his well-known and delicate style of work. Mr. E. C. Clifford's eleven frames include some charming bits of landscape and old buildings, especially "Spring at Kew" and "Camber Sands." Mr. Crompton shows among his set an effective sketch of the old timber bridge at Walberswick, and Mr. Huson has a fine set of sketches in the broad style of the old water-colour school; indeed "Across the Moorland" might almost pass for David Cox. A good many we must pass over for want of space; Mr. James Orrock sends a dozen sketches in his well-known wet-weather style, and Mr. Bernard Partridge some interesting figure studies, "The White Wrap" one of the best. Among the contents of the large room may be mentioned Mr. Graham Petrie's "Oleanders, Venice" and "The Harbour, Ragusa"; Mr. John R. Reid's set of nine drawings; Mr. J. Pedder's "Spring" and "Devonshire Primroses"; Mr. David Green's "Sea Breezes" and "The Dyke Bridge" among a set of fifteen; Mr. John White's set of twelve, all good; Mr. Joseph Knight's rather mannered drawings, of which however "The Vale of Llanwrst" and "Winter" are fine; Mr. F. G. Cotman's set of twelve; Mr. Frank Dadd's "Chance Acquaintance," a clever study of a soldier and a dog; and Mr. Bernard Evans's landscape sketches, powerful in effect but a little overstepping nature. Mr. John Fulleylove exhibits a dozen sketches, chiefly of the architectural subjects which he handles so well. Among the five by Mr. Frank Walton, "Epercherie Harbour, Sark," shows a most effective treatment of sea. Mr. Dudley Hardy's "Study for a Decorative Panel—Evening," a composition of dark trees and a couple of columns of a classic ruin, is a fine suggestion of the kind, and his various studies of single figures show much artistic feeling in line and colour, especially "The Red Rose." In the East Gallery Mr. Weedon is an exhibitor, and Mr. Thos. Pyne, and Mr. Claude Hayes, whose fourteen subjects contain much admirable work in a good and broad water-colour style, especially "On a Surrey Common" and "Near Guildford."

The Memorial to Mr. Penrose.

ON Saturday afternoon last some fifty or sixty persons, architects and others, were collected in the crypt of St. Paul's Cathedral to do honour to the unveiling of a memorial tablet to Mr. Penrose placed there, with the permission of the Dean and Chapter, by the Institute of Architects. Mr. Aston Webb, in a short introductory speech, pointed out that the position chosen for the tablet was an honourable one, inasmuch as it was placed back to back with the well-known tablet to Wren in the adjoining bay. Sir L. Alma-Tadema then made a brief but very comprehensive review of Penrose's character and work, and of what he had accomplished especially in elucidating the architectural practice of the Greeks. Sir Lawrence then unveiled the tablet, which bears the following inscription:—

"To the memory of Francis Cranmer Penrose, D.C.L., LL.D., F.R.S., F.S.A., Knight of the

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Order of the Saviour in Greece. For 45 years Surveyor to this Fabric. President of the Royal Institute of British Architects from 1894 to 1896. Antiquary to the Royal Academy. Architect, Antiquary, and Astronomer. A profound Scholar. Author of *The Principles of Athenian Architecture*, whose distinguished services, in revealing the refinements of Greek architecture, are here commemorated by his professional friends and admirers. Born October 29, 1817; died February 15, 1903."

The inscription forms a very good summary of the varied accomplishments of Penrose (more varied than many who knew him only on one side were aware of), but we must regret that in a tablet erected by the Institute of Architects there should not have been at least a simple decorative treatment, analogous to that of the Wren tablet, instead of a mere framed slab like a school slate. Simplicity may be carried too far. Subsequently to the unveiling, M. Choisy made a few remarks in French, in appreciation of Penrose, and the short and very suitable service form provided at the Cathedral for such occasions was gone through. Among those present were Dr. Penrose and Miss Penrose, the son and daughter of the architect, Mr. Locke, the Secretary of the Institute of Architects, Mrs. Aston Webb and Miss Webb, Mr. J. MacVicar Anderson, Sir John Taylor, Mr. Blashill, Mr. Ingelow, Mr. Crace, Mr. H. H. Statham, Mr. T. H. Watson, Mr. Worthington, and others.

ARCHITECTURE AT THE ROYAL ACADEMY.—IV.

PERHAPS the most characteristic phase of present-day English domestic design, and the style which manifests the greatest individuality among the exhibits in the Architectural Room, is that of the smaller sized dwelling in which simplicity and a quiet restraint are striven for. There are various processes at work, such as narrow planning with its long simple roofs and a strict attention to a consistently *petite* scale; but the results are as much due to a keener appreciation and a more thoughtful application of material as to any other cause. We therefore find fewer kinds but larger masses of stone, brick, or rough cast walling and tiled roofing, and at the same time a growing disuse of mouldings and carved features.

The three country houses designed by Mr. Guy Dawber, and shown by charming pen drawings, are foremost in this group. "Bibsworth, Worcestershire" (1483), illustrated in our issue of May 14, 1904, is the most interesting and has stone coursed walls, stone slate roofs, and brick chimneys. A substantial feeling is given to the design by the regular massing of the larger parts, and little but bare necessity is present in the details. The entrance receives a slight importance by the introduction of a coping with finials to the porch gable, whilst tile verges only show in similar features elsewhere. The influence of the old Cotswold houses is clearly felt; and rightly so. Another house very much in the same manner is "Coldicote, Worcestershire" (1484), but this is hardly so satisfactory in its grouping and vigour. "Park Down, Surrey" (1486), has rough cast walls rising from a brick base and tiled roofs. The general appearance is that of a delightful home, planned in an L form. It is instructive to note that the author is careful to adapt his detail to the particular materials employed. "House at Munstead, Surrey" (1465 and 1488), by Mr. E. W. Mountford, is a design somewhat of the same type, but a little restless with bargeboards, half-timbered gables, and stone canted bays. The plan is H-shaped, rather wide in the centre. Some of the detail, notably the chimneys, is capable of improvement.

A form of plan very much resorted to consists of a central part flanked by wings set at an angle of 135 deg. or thereabouts, thus: ⌒. No. 1487, "House at Garn Hill, near Cardiff," by Mr. Carter, is arranged on these lines; the detail, however, has not advanced with the evolution of the plan, and belongs to a period of Victorian work when design was not of the best. "House at Edenbridge, Kent" (No. 1622), designed by Mr. R. W. Schultz, is all that can be desired. It is perhaps the most attractive house in the room, sympathetically drawn in coloured chalk. The materials intended to be used appear to consist of red brick to the ground story, tile hanging to the upper floor, and tiles on the roofs. There is breadth in the fronts, and the hipped gables as well as other minor details point to the desire to maintain the character of old Kentish work. The brick chimneys are planned to make dignified effects and enhance the interest of the design.

"House for a Painter" (1511) is an affectation in its essentials. The design is illustrated by two plans, clever in many respects, and a fidgety elevation; but the author, Mr. H. F. T. Cooper, has omitted scales and compass points, two omissions which bring doubts as to good planning to our mind. To the right of the entrance hall is "Visitor's bedroom," whilst from an inner hall ascends a large staircase to "The Painting Room" with which are arranged *en suite* "The Sleeping Room" and "The Bath." There are some working inconveniences in the minor parts. The plan lends itself to a grandiose treatment; but the elevation, called "The Front Aspect," does not rise to the occasion. No. 1517, a "House at Parbold, Lancashire," shown by a good water-colour drawing, has insufficient merit to warrant such a prominent position on the walls. Messrs. Everard and Pick send a line drawing of an admirable brick "House near Leicester" (1539) in which the prevalent ideas of restraint are maintained. The garden front is given, where it is seen that a large bay window with parapet is placed at each end, and the intervening space is finished at the eaves, provided with a cast-lead gutter. A simple roof crowns the composition and the detail is well suited to the materials. No. 1541 is an attractive ink sketch of "House and Gardens at Berkhamstead," in neither of which, however, are the intentions of the authors, Messrs. Mawson and Gibson, quite intelligible.

Mr. Reginald Blomfield is represented by "Design for Penn House, Weston, Bath" (1557), shown by three elevations, a section, and two plans; from the latter all information is withheld as to the nature of the various apartments, while the hatchings on the walls indicate a remodelling of an old house and not the erection of a new dwelling implied by the title. It is therefore fair to assume that the scheme was to a certain extent affected by existing conditions, but a careful examination of the drawings will prove that the author has produced an excellent design, presumably in local material. The rough cast and tiled "Cottage at Sunningdale" (1571), by Mr. Leonard Stokes, is a simple subject yet possessing considerable character. The irregular planning at the east end is interesting. The long broad roof running down to the ground story supplies valuable contrast to the well designed features which rise through it. "Proposed House near Brussels" (1585) is symmetrical in its fronts, but the interest is rather killed by the many materials which the author, Mr. W. C. Jones, has selected. No. 1587 is a view of a "House at Rugby" by Mr. J. W. Simpson. No plan is given, but it must be admitted to be a clever and well-studied piece of design, perhaps only marred by the bay window excrescence at the west end.

Mr. Ernest Newton exhibits another "House at Bickley, Kent" (1588), built in that delightful brick and tile manner which he has made his own. This excellent drawing appeared in our pages of May 14. Another contribution by the same author is No. 1586, "Lodge and Cottages at Overbury, Worcestershire," which seem to be built with the stone materials of the district. It is interesting to observe how the architect departs from the brick treatment to which we have just referred, and produces equally charming stone designs. The "House at Reigate" (1613), by Mr. T. P. Figgis, is a good composition shown by a nice coloured sketch. "House in Elsworthy-road, Hampstead" (1555), by Mr. Horace Field, is Georgian in feeling and a very excellent design, too. Another house in Hampstead is No. 1645, a Tudoresque brick and stone building by Mr. C. F. A. Voysey. The plans give a good deal of information, some of which is open to criticism; it is, however, gratifying to find this well-known designer emerging from the use of rough cast and the particular details with which he has long been associated. No. 1642 is a house of some importance at "Wolves Newton, Mon."; the design would appeal more to the spectator if the author, Mr. A. J. Hardwick, had appended a plan. Mr. Collcutt's design for a "House near East Grinstead" (1597) was published in our issue of November 7, 1903. Like the curate's egg, parts of it are excellent, but the curly lines in the drawing are worrying. "Wynn Lodge, Willenhall Estate, Barnet" (1651), is a tall-looking suburban house, the outcome of a square compact plan. Although cheaper, this is not an arrangement which lends itself to satisfactory elevations. That this is felt, is shown by the fact that the author, Mr. S. W. Cranfield, has put a gablet to add respectability to the length of the main ridge. Messrs. Mallows and Grocock send "Lodge at Pembury, Kent" (1659), which is a most interesting stone and timber composition shown in a good pencil sketch. The stone base adds largely to the pleasing result, and the external staircase is a happy note in the conception. No. 1660 is a design for "An Essex Vicarage" by Messrs. Freeman and Ogilvy. The drawing, in spite of the absence of plan, suggests a really good house; and an important point is the recognition of the brick and plaster tradition of the eastern counties. Mr. F. S. Chesterton contributes two sets of terraced houses, No. 1514, at Norbury, and No. 1629 Hornton-street, Kensington; both possess merit. The former is a welcome sign in the employment of an architect for the smaller classes of houses which have disfigured the metropolitan suburbs.

A large number of designs for business premises are exhibited, and they do not, taken as a whole, indicate any material progress in this kind of building. There is a lack of direct external expression of the purposes to which the structures are put. Take, for instance, the "Warehouse in Great Charles-street, Birmingham" (1441), by Mr. W. H. Bidlake. The immediate impression is that of a public institution. A heavy stone arcaded ground story supports two upper floors, the large brick piers of which stand most uncomfortably upon the arches below. There is no plan, but the drawing is good, although barely up to Academy strength. The "North-Eastern Railway Company's Offices in Westminster" (1437) are designed in excellent Georgian archæology, of which Mr. Horace Field is a capable exponent, but the domestic air of the front is scarcely representative of one of the great railway systems of the kingdom. No. 1457, "Warehouse and Offices, No. 20 and 21, Queenhithe, E.C.," is more to the point. The two lower stories in stone have a flat treatment, and the upper floors in red brick have recessed planes giving to the design some idea of the nature of the building. The "Greaves Pumping Station of the East London Waterworks" (1476), of which Mr. H. V. Ashley is the architect, is an excellent classic treatment for a work of this description. The "Post Office at Deal" (1477) is a clever application of Dutch architecture. The lower side gables have no visible use, and the windows of the sorting office seem quite inadequate. Mr. C. B. Hutchinson also shows the "Borough Offices" (1521) for the same town, designed in a similar manner; the reproduction, however, of features of a delightful period can scarcely be reconciled with the utilitarian necessities of this type of public building.

Mr. W. Campbell Jones exhibits two provincial bank buildings, both of which have good points. No. 1538 is at New Brompton in Kent, and 1535 is at Colchester. "Craven House, Kingsway" (1536) is the work of Mr. H. Tanner, jun. There is no plan of this building, but the front has considerable variety, which appears to be obtained at little inconvenience to the working of the parts. "Nos. 78-81, Fetter-lane, E.C." (1562), is a Flemish kind of stone front, with some good points in the design, of which Messrs. Treadwell and Martin are the authors. No. 1580 is a spirited sketch of a well-schemed public-house, "Cross Keys, Burnley," by Mr. J. Horsfall. "Bank Premises at Kettering" (1590), by Messrs. Gotch and Saunders, is drawn as though the front were applied to an old building; the design also suggests this, for there are no cornices or other evidences to the contrary on the returned ends. The chimneys rising from the front balustrade are unsatisfactory, and the two entablatures stretching across a small front of this nature are overdone. One of the best street fronts is No. 1610, "New Office Premises, Nottingham," designed by Messrs. Brewill and Baily, the salient feature of which is the steep pediment rising in front of a mansard roof. The scale and detail of the parts is most satisfying. "Kingsgate House, High Holborn" (1630), illustrated in our number of May 21, 1904, is an unorthodox street front, shown by an excellent

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coloured perspective drawing. The architect, Mr. A. Keen, has introduced originality throughout the design, which in no way affects, but rather enhances, the practical points of the building. By way of criticism, we should say that the ground story is much too weak for the apparent work required of it; and although the side entrances complicate the planning, a more vigorous handling is possible. No. 1631, "New Premises, St. James's-street, W.," by Mr. L. W. Green, is in no way a desirable addition to the buildings of this important thoroughfare. No. 1658 is a scale drawing of the front of the offices of this Journal, designed by Mr. H. H. Statham, to which a sheet of mouldings and details to a larger scale is added. We may be allowed to express the wish that the authors of larger and more important fronts would add large-scale details to their drawings for exhibition, instead of depending merely on small perspectives or elevations. It would add to the interest of the architectural room.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

Alteration of By-law.

A SPECIAL general meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, Regent-street, W., to confirm, as required by clause 33 of the Charter, the resolution passed at the meeting of June 6 with respect to the addition to the first clause of by-law 3. Mr. Aston Webb, R.A., President, who occupied the chair, read the addition, as follows:—

"After December 31, 1906, every person desiring to be admitted a Fellow shall be required to have passed the examination or examinations justifying him as an Associate, or shall be elected from the ranks of the Associates. But in special cases the Council, by the votes of three-fourths of such members of the Council as are present and voting at a meeting of the Council, shall have power to dispense with such examination or examinations."

The addition having been agreed to, the special meeting then terminated.

Deceased Members.

The sixteenth general meeting (ordinary) was then held, when Mr. Alex. Graham, Hon. Secretary, announced the decease of L. C. Pedro D'Avila, Honorary Architect to the King of Portugal, Architect to the Government, Member of the Royal Academy of Fine Arts, Lisbon, who was elected an Honorary Corresponding Member of the Institute in 1900; and James William Brooker, elected an Associate in 1887, and a Fellow in 1892.

Mr. W. J. Locke, Secretary, said that as he knew M. Pedro D'Avila, perhaps he might be allowed to say a few words about him. The deceased gentleman was a man of the kindliest heart, and was always ready to do everything he could to advance the interests of architecture in Europe. M. D'Avila had attended every International Congress of Architecture—it was at the last two congresses that he (the speaker) had met him—and he put his services at the disposal of the Institute whenever occasion arose. The position of Hon. Corresponding Member of the Institute was regarded by him as one of the honours of his life.

New Members.

Some members attending for the first time since their election were then received, including the Rt. Hon. Lord Stanley of Alderley, who has been elected an Hon. Associate.

The Royal Gold Medallist.

The Royal Gold Medal for the promotion of architecture, conferred by His Majesty the King, was then presented to M. Auguste Choisy, Hon. Corresponding Member, Inspecteur-Général Honoraire des Ponts et Chaussées, Paris.

The President said—

It is, I think, a happy custom of the Royal Institute of British Architects to wind up its session by the most interesting event of its year, viz., the presentation of His Majesty's Gold Medal, and when (as to-night) the recipient attends in person to receive it the interest and distinction of the occasion is further increased. This medal, as you all know, is given by His Majesty, who graciously allows the Institute to recommend a recipient for His Majesty's approval, and it has become a custom to select one year an English architect, the next a foreign architect, and the third a literary man, whose work has made for the advancement of architecture. This year, accordingly, we considered the claims of literary men for this high honour, with the result that the Council and the general body of members of this Institute unanimously decided to recommend to His Majesty M. Auguste Choisy as the recipient of the medal; the royal approval was graciously granted, and M. Choisy is here this evening to receive the medal at our hands. There are no such things as politics recognised in this Institute, but I may perhaps be allowed to say that it is an event of happy augury that our choice should have fallen upon a Frenchman at this particular moment when our relations with that great and illustrious country are so friendly, and also that we have been able to come as unanimously to an agreement on the selection of a Royal Gold Medallist as these two countries have recently been able to do on matters connected with the highest State interests of these two great countries. We are further honoured this evening by the presence of a distinguished representative from the French Embassy in London, Comte de Manneville, placing, as it were, the official seal of approval of that country on our choice; and I cannot as your President let this occasion pass without expressing on your behalf, and my own, our unbounded admiration for the great band of artists in that country and the works they have produced in all materials for centuries. In architecture we recognise that they are still working on traditional lines, but at the same time in the modern spirit, and the close alliance of architecture, painting, and sculpture, as shown in their buildings, fills us with sincere delight and the highest respect and esteem.

It is, as you know, by no means the first time that we have recognised the genius of a Frenchman. This medal was awarded, in 1855, to M. Hittorff; 1861, M. Lesueur; 1864, Viollett-le-Duc; 1867, M. Texier; 1876, M. Duc; 1886, M. Charles Garnier; 1892, M. César Daly; but none, I think, have done more towards elucidating the modes of construction employed by the ancients than our guest of to-night, M. Auguste Choisy.

I could wish that the honourable duty of laying before you some short account of the work of M. Choisy were in more capable hands than mine, for I can make no claim to archæological learning which would justify me in presuming to review his work. It lies before you on this table to-night—some seven volumes, small in bulk; gigantic in labour, thought, and result. The names of these works have made M. Choisy famous wherever interest in such subjects is taken. They are *L'Art de bâtir chez les Romains;* 1873, *Le Sahara,* 1881; *L'Art de bâtir chez les Byzantins,* 1882; *Etudes Epigraphiques L'Architecture Grecque,* 1883; *Histoire de l'Architecture,* 1898, and *L'Art de bâtir chez les Egyptiens,* 1903, together with other smaller works. The first of these great works, therefore, was *L'Art de bâtir chez les Romains,* published in 1873; the last *L'Art de bâtir chez les Egyptiens,* which, as one may say, has put a crown to M. Choisy's life work, and was published so recently as last year.

In the art of building among the Romans, M. Choisy (and I am indebted to Professor Aitchison and to our Secretary, Mr. Locke, for much of this information) first introduced us to the Roman search for an economical method of building vaults and domes. Alberti had already discovered how walls were built by the Romans, but he went no further, and the great marvels of the building of vaults and domes were still undiscovered. He has shown us, amongst many other things, how experience enabled the Romans to abolish the open network which kept the green centring in place, and how to adapt a single brick for the thickness of these great vaults of 80 ft. span by inserting pieces of a second course to secure the corners at the junction, and by using the rubble or concrete filling in horizontal courses, the means probably adopted to equalise the pressure in the dome of Hadrian's Pantheon; all this is clearly shown in M. Choisy's illustrations. In his art of building among the Byzantines he shows how the Romans, with diminished means, were enabled to build vaults without centring. M. Choisy's great work, the *History of Architecture,* is a masterly exposition of the treatment of a subject from a single point of view. The result of fifteen years' strenuous labour, it is the history especially of architectural construction, from the earliest times to the present. The innumerable line illustrations are nearly all the work of his own hands, drawn for the most part in isometric perspective in the inimitable manner of the French draughtsman.

In his art of building among the Egyptians he has developed the theories set forth in the Egyptian section of his history, and concludes his researches into the methods employed for centring their great arches and in lifting their great monoliths. His work on Greek inscriptions contains a series of studies in Greek inscriptions in the arsenal of the Piræus, and the walls of Athens, and the Erectheum, and a marble slab was discovered with a complete specification for the building of the arsenal. A noticeable point in M. Choisy's work is the clearness and conciseness of his style; for what many would have taken three pages to describe, M. Choisy puts in three lines.

From this, necessarily brief and incomplete, account of M. Choisy's work, you will see that they are not merely historical accounts and records of buildings, but are the result of entirely original research and thought; and are, I take it, intended also to make the reader think out things for himself. They should be especially interesting to us English architects who are about to consider the question of architectural education, especially in connection with construction as the basis of design. For it is on account of these invaluable scientific researches into the history of architectural construction contained in these volumes that we are here to present M. Choisy with the Royal Gold Medal to-night. Perhaps M. Choisy will permit me to give a few personal details of his career. Born at Vitry-le-François, February 7, 1841, he early derived his taste for architecture from his father, an architect; and he was from the first struck by the relation between the scientific study of construction and the art of architecture. He entered the École Polytechnique and studied under Leonee Raynaud. In 1863 he joined the Government Department of the Ponts et Chaussées, where he was for many years Engineer-in-chief, but has now retired with the title of Honorary Inspector-General of the Ponts et Chaussées. After the publication of his first book, *The Art of Building Among the Romans,* his conclusions were felt to be so startling that, through the medium of Raymond and Viollett-le-Duc, he was sent on an architectural mission to apply the same system of investigation to the architecture of the Byzantine Empire.

For many years M. Choisy was a professor at the École des Ponts et Chaussées and at the École Polytechnique. In 1870, M. Choisy fought for his country in the terrible war of that time. In 1889 he was elected a honorary member of this Institute.

M. Choisy, allow me, on behalf of myself and my colleagues of this Institute, to congratulate you on the production of these epoch-making works and the honours you have received, and at the same time, as President of the Royal Institute of British Architects, to present to you this Gold Medal conferred by His Most Gracious Majesty the King on the unanimous recommendation of your British *confrères.*

[The President at this point presented the medal to M. Choisy.]

I trust that you may long be spared to enjoy the honours which have been the result of your loving and unsparing labours in the exposition of the great art of architectural construction.

M. Choisy, in response, said:—

Mr. President, ladies and gentlemen, I should be happy to express to you my gratitude in the language of your great nation, if I felt myself equal to it: but, unfortunately, I do not feel competent; so I shall ask you to allow me to give it in French.

La récompense que j'ai l'honneur de recevoir de vos mains, Monsieur le Président, dépasse toutes mes ambitions, et les témoignages de haute sympathie dont vous avez bien voulu l'accompagner me la rendent plus précieuse encore. L'annonce d'une telle distinction m'a semblé un rêve. Il m'a fallu relire le vote si bienveillant de l'Institut Royal, relire la sanction suprême dont Sa Majesté a daigné la revêtir: il m'a fallu vaincre le profond sentiment de de mon insuffisance, pour arriver à me convaincre que je pouvais être le titulaire de la Royal Gold Medal, pour penser que mon nom allait être inscrit à ce Livre d'or où figurent tant d'hommes illustres, la gloire de l'art britannique,

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et cette élite d'artistes auxquels le R. I. tend une main confraternelle, sans égard aux nationalités et aux distances. C'est un admirable trait de cette noble et libérale institution de savoir ainsi s'élever audessus des distinctions de frontières ou d'écoles, et grouper en une grande famille ceux que rapproche la communauté des aspirations et le désir d'agrandir le patrimoine de l'art.

En ma qualité de Français je suis doublement fier de l'honneur que je reçois: j'y vois un nouveau et éclatant témoignage des franches sympathies qui règnent entre votre nation et la mienne; j'y vois l'expression touchante des sentiments que la population française a chaleureusement manifestés à Sa Majesté Edouard VII. dans une visite à jamais mémorable: ce sont les sentiments mêmes dont témoigne par sa présence le digne délégué du Gouvernement français, que je suis heureux de saluer dans cette enceinte.

Mes chers collègues, si je ne craignais d'abuser de votre trop indulgente attention j'aurais plaisir à réveiller ici quelques souvenirs qui comptent parmi mes meilleurs, parce qu'ils font remonter bien haut les relations entre le R. I. et celui qui lui exprime en ce moment son attachement sans réserve et sa profonde gratitude.

Avant tout, le souvenir de l'illustre et si regretté Penrose: J'osai, devant sa tombre même, rappeler l'émotion respectueuse que je ressentis en apercevant, grâce à des fouilles postérieures à ses travaux, les courbes de la plateforme de ce Parthénon qui est l'impérissable monument de sa gloire. Mon premier mémoire fut un hommage à votre immortel architecte; et aujourd'hui la récompense dont le R. I. m'honore grandit encore à mes yeux quand je songe qu'un tel homme l'a comptée parmi ses titres.

Si le R. I. fut le promoteur de mes recherches, un de ses membres dont l'amitié m'est chère en fut un des premiers confidents: M. Phénè Spiers a bien voulu, dans votre Journal même, consacrer une allusion charmante à ces féconds entretiens d'Athènes, où j'ai tant appris et puisé tant d'encouragements.

Un souvenir encore: Presque enfant, feuilletant les livres de la bibliothèque de mon père, j'eus la bonne fortune de rencontrer le Mémoire du Révérend Willis sur les voûtes du moyen âge. Ce fut une révélation: C'est ainsi, me dis-je, que les formes doivent être analysés; c'est ainsi que le dessin doit exprimer la structure. Et, lorsque j'essayai de résumer les procédés romains, j'eus sans cesse présent comme un modèle de méthode ce mémoire sans précédent, qui marque à la fois les débuts et le dernier terme de la critique architecturale.

Ainsi, dès mes premiers essais, c'est le mouvement imprimé par le R. I. que j'ai suivi: l'impulsion était vôtre; c'est au R. I. que je dois l'hommage des travaux dont il fut l'inspirateur. Maintenant, messieurs, l'honneur dont vous me comblez m'engage, et je tiens à reconnaître devant vous les obligations qu'il m'impose: tant que mes forces ne me trahiront point, j'aurai à cœur de répondre à un tel encouragement. Je voudrais éclaircir quelques points de cette théorie de l'art antique dont Vitruve est l'interprète; et, ici encore, pour mener à bien l'entreprise, je compte sur les lumières d'un maître pour qui Vitruve est l'objet d'un culte et dont les œuvres sont un reflet de l'hellénisme, M. le professeur Aitchison, mon éminent et vénéré ami.

Pardonnez-moi, messieurs et chers collègues, d'avoir parlé si longuement de moi-même; mais j'aurais cru manquer à la reconnaissance en négligeant de rappeler ce que je dois aux influences britanniques: aux membres du R. I. qui m'ont ouvert la voie, à ceux qui veulent bien m'y soutenir et m'y guider.

La distinction que je viens de recevoir couronne avec un éclat inespéré la plus longue partie de ma carrière; dans le chemin qui me reste à parcourir je crains moins les défaillances; il me suffira de lever les yeux sur la Royal Gold Medal pour me rappeler jusqu'à la fin qu'il me reste de sérieux devoirs à remplir, de nouveaux efforts à tenter si je veux parvenir à m'en rendre moins indigne. M. le Président et mes chers confrères, encore une fois et de tout cœur, merci.

Professor Aitchison, R.A., said that the President had done him the honour of asking him to say a few words on M. Choisy and his inestimable works. M. Choisy's first work, on *The Art of Building amongst the Romans*, was, to the best of his recollection, published in 1873. At that time the speaker was a member of a little architectural club called the Foreign Architectural Book Society, which was shortened, as is the custom in England, into its initial letters and was called "Fabs." During the time he was a member of that club, M. Choisy's work, *L'Art de Bâtir chez les Romains*, was passed round for the perusal of members. He read it through carefully, and came to the conclusion that one had come at last on the Columbus of ancient construction. The author was a man who had carefully examined every particle of evidence he could find in the buildings and ruins of antiquity, and had applied his extraordinary capacity of mind to reading the causes of the things that had happened, the causes of the particular form of construction that the Roman buildings had taken. One of the most brilliant intellects the modern world had seen, Leon Battista Alberti, had also carefully examined the ruins of ancient Rome, yet, though he grasped the method of building the walls, he never was able to grasp the method that the Romans employed in building their vaults and domes. Here, however, in the case of M. Choisy, was a man who, with the data given, was enabled to construct mentally the way that the Romans had built their vaults and domes. He came to the conclusion that the Romans, when they were going to build on a large scale, cut down the nearest wood and used it for making the centring. Economy with them was important, as it is always with the architect. By using this green wood they saved considerably on the cost. But when it was put up in that green state, especially in a warm climate like Italy, it had to be kept rigid to prevent deformation by twisting and shrinking. They therefore laid a course of Roman bricks usually about 1½ in. thick. This alone did not appear sufficiently strong to support the weight of a vault that was to span 80 ft. To strengthen this they put tiles on edge, thus forming coffers, and by that means they kept the whole thing steady, and any slight shrinking of the portion below was practically of no consequence. They then filled this up with what we now call concrete, but which was in fact rubble. Small pieces of brick and stone and marble were used. They then shovelled on the mortar and put stones in by hand. After a time they became better acquainted with the strength of these bricks, and ceased to employ the coffers of bricks on edge. One course of these Roman tiles was put over, and where the four tiles met together they put a quarter of a tile over the junction, and they found that merely that inch and a half of brick would enable it to bear the concrete, or rubble, if this were put in horizontal courses. So they began from either side and put these courses on: as they got sufficiently set to admit another course it was put on, and so on till it came right across. The thickness was eventually made up to 5 or 6 ft., the usual thickness of these great vaults, and was tiled over to keep the rain from soaking in. Certainly, if these vaults of such a great thickness were carried up comparatively rapidly, so that the mortar had not quite set, there was a slight inclination to push out, and at the Basilica Maxentius, commonly called the Temple of Peace, or the Basilica of Constantine, there were brick flying-buttresses put up to restrain the spreading of the vault. M. Choisy had travelled extensively, and had had a most experienced and acute eye in seeing what was to be seen from the work done in old times. This he had compared with the work that was being done in primitive countries by the native masons themselves, without an architect, proving it to be merely traditional skill. He had put these together, and by the clearness of his mind and his capacity for reasoning he had found out how these large vaults were done by the Byzantines. They built out what we call a corbelled skewback on a wall, and as a slanted arch, and by carrying these on and putting brick after brick on they made the whole vault without a centre. The great dome of the Pantheon, we now know, could not have been earlier than the time of Hadrian, because M. Chedanne, by permission of the Italian Government, was enabled to cut out bricks from the foundation up to the ring of the eye, and every brick that was cut out was found to bear Hadrian's stamp. That showed it was not begun before his time, because the instant a new emperor was elected all the new bricks were made with his stamp. M. Choisy had shown there were settlements in the dome during its construction which caused discharging arches to be put in. The great disputes between the architects and engineers of the civilised world just before the building of the dome of Florence Cathedral, gave us some idea of what was generally thought, and Vasari told us that one of the engineers in particular said that the dome at the Pantheon was built on a mound of earth, that in putting in the earth and ramming it so as to take this weight they were said to have thrown in pieces of money, so that when the dome was sufficiently steady to allow of the removal of the earth, it would be taken away by the people for the sake of the money they would find buried in it. M. Choisy has given a long account of the Greek inscriptions, and also of the specifications that were found engraved for the Piraeus or the arsenal, and it showed the great care the Greeks took that everything they did to their public buildings should be as perfect as possible. But his last work on Egypt is perhaps the most interesting of all. There he tells us that the enormous stones of the Pyramids and pylons were carried up by means of staircases built in the crude brick, and that which we thought were the partial centres for semicircular arches were merely oscillating machines, which were put on the steps of these staircases, and tilted over by the weight of men hanging on to ropes, or by bars, and the stones put on these. These oscillating elevators could then be blocked up and gradually lifted up to the level, where the stones would be put on by hand labour. M. Choisy had published also an account of the forces acting one against another in the dome of Santa Sofia at Constantinople, and had given us some very interesting information as to the building of domes and spires in the East, where the masons of several neighbouring villages was got together at the same time for the purpose of holding the stones in their place till a key was made. M. Choisy is of opinion that something of that sort was done at Santa Maria dei Fiore at Florence. He (the speaker) could only say that when he came to the conclusion that he had found the Columbus of ancient construction he determined if possible to make his acquaintance. To say that M. Choisy was a very polite man was rather a slur on his countrymen, for the French were particularly distinguished for their politeness. But M. Choisy had, besides the politeness of the ordinary Frenchman, that admirable quality of giving you all the information he possibly could, and doing everything for you that you might want. He (the speaker) thought they ought not to let the evening pass without paying a compliment to their most gifted President. Indeed, he thought they ought to congratulate him on putting his final vote to this desire of the Institute that M. Choisy should have this recognition from His Majesty himself for his good efforts on behalf of our own art.

Sir L. Alma-Tadema, R.A., said that in thinking of his life and experience he had often remarked on the dispute between theory and practice. He was happy to think that the days were passed when it was thought that practice was practice and theory was profession, for theory without practice and practice without theory did not exist. One saw that practical education was gaining ground, and that no theoretical principles could be kept up if they were not supported by practical experience. We saw men come forward—like Quatremère de Quincy, who, being a sculptor, knew how theory could be made subservient to real serious work; like Viollet-le-Duc; and like M. Choisy, whose theory had been based on practice, and whose theories were so good because they were so practical. He had looked through M. Choisy's books and he found in them ideas so clear and simple that he could not help saying: "Why on earth did I not think of that myself?"

Mr. R. Phenè Spiers said it was a very great pleasure to him to know that a *confrère* whom he met nearly forty years ago, and who at that period had already shown extraordinary proofs of his genius, should come forward to receive the gold medal of the Institute. He remembered distinctly the first time he met M. Choisy; it was intensely hot weather, in August, in the Theatre of Bacchus, and it was very dry work. This Theatre had only lately been discovered. For years all the archæologists had pondered over its position, and it was not, he thought, till a year and a half or two years before he was there that some excavator happened to light on its pavement. He recollected this more especially because when he brought his drawings over here they were exhibited at

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Conduit-street, and one of the older members, Professor Donaldson, saw for the first time that which he had dreamt of in his youth—that was to say, his (the speaker's) drawings were the first drawings of the Theatre of Bacchus for which Professor Donaldson had long sought the traces. It was in the Theatre of Bacchus, in 1866, he first met M. Choisy. They discussed various theories, and he found in his notebooks when he looked through them afterwards an entry to the effect that he had met a French gentleman on the site who seemed to have the most wonderful theories on every possible subject. On the following day he met M. Choisy again, and then he found he was a member of the French School at Athens, and they then had long talks about the school. He had seen M. Choisy's works and valued them since. *L'Art de Batir chez des Romains* he had studied with the greatest possible interest. It was followed by the Byzantine work, but he thought the one which filled him with the most delight was his clear and exact reading of the specification of the Arsenal of the Piræus. One of the subjects of which we knew very little, unfortunately, was the method by which the Greeks constructed their roofs. We have only the sinkings in which the joists or beams ran to guide us as to the size of those timbers, and as regards their construction we know scarcely anything. But that specification discovered in 1892, was translated by M. Choisy, who also made a conjectural restoration. It was open to anyone to compare M. Choisy's translation, or translate it himself if he liked, and then see his interpretation of it in the admirable conjectural restoration he had made. It was plain to every one; no one had contested it at all; it was accepted at once as the only true interpretation. His studies on the roof of the Erechtheum, were of extreme value and interest, and for these subjects we are greatly indebted to M. Choisy. But he had, in addition to that, published a work which it took a very long time to follow and to understand, because of the enormous range which it covered. His *History of Architecture*, ranging from the earliest times down to the century before last, was a most extraordinary work. In those two modest volumes M. Choisy gave a history which might have taken thirty or forty volumes. It was a most astounding work, and he (the speaker) sincerely hoped it would be translated into English, and form a standard of most extraordinary value, because at every moment it set the student reasoning for himself in order to follow the author's conclusions. That was one of the test points of education; we want men to reason for themselves and not simply to accept theories or formulæ.

Vote of Thanks to the President.

Mr. John Slater said that before the meeting separated he was quite sure it would be their wish to pass a hearty vote of thanks to the President on the occasion of his resigning the chair. There had been during the existence of the Institute many eminent Presidents, but he thought they would all agree that very rarely had they had a President who so combined in himself eminence as an architect and excellence as a President as did Mr. Aston Webb. They would all part with him as President with the greatest possible regret, and it was a source of grief to most members of the Institute that when a President resigned the chair he could no longer serve on the Council or give them the benefit of his advice except unofficially. They all wished Mr. Webb many years of life and prosperity, and that on the peaceful fields of art he would go on from victory to victory, for what he had done was only an earnest of what they expected him to do in the future.

Mr. H. H. Statham said he had been asked to second the resolution, and it was a great pleasure to him to have an opportunity of associating himself with what Mr. Slater had said as to the regard and respect which they felt for Mr. Webb, who combined so admirably practical knowledge with artistic feeling, and who as President had so well combined business capacity with courtesy and kindness.

Mr. Butler Wilson, President of the Leeds and Yorkshire Architectural Society, said that though he had not been asked to support the vote of thanks, yet, as a representative of an allied society, he could not let the opportunity pass without, on behalf of his own society and, he was sure, on behalf of other allied societies, saying that the provinces recognised the great services that Mr. Webb had given so liberally to his profession. Mr. Webb had instituted those "At Homes" which had given an opportunity for provincial members not only to meet each other but to meet the London members. Mr. Webb had also suggested the importance of opening the columns of the *Journal* more freely to reports of provincial meetings, and altogether he had expressed a most liberal view of the profession. He had gone hand-in-hand with the profession since the time he was President of the Architectural Association.

The motion having been very heartily agreed to,

The President, who was received with loud applause, said they had more than repaid him for the delightful times he had had with them for the last two years. It was twenty years since he first took some office in the Institute, and he thought he had filled every office since. When he was elected to the chair he made two promises. One was that he should make mistakes and that promise he had fulfilled. The other promise was that when he made mistakes that they would be from want of judgment and from a desire as far as possible to serve what he believed to be the interests of the Institute to the best of his ability. He was greatly indebted to other members of the Institute for their help. He was greatly indebted to his friend, Mr. Alexander Graham, the Hon. Secretary, who had given him the most loyal support; and to Mr. Locke, the Secretary, and to every member of the staff of the Institute. He was quite sure that no institution of that sort had ever been so well served, or could be better served, than was the Institute by the officers who were connected with it, and his thanks were greatly due to them. He was also indebted to the members of Council, every one of whom had extended to him great courtesy and personal kindness. He felt sure that in the future the new Council would extend the same kindness to his successor who, he was proud to know, was Mr. Belcher. The Institute was entering upon a somewhat difficult time, during which a considerable amount of care and consideration would have to be exercised by all those who had the direction of affairs, and they would all regret, he was sure, if anything should be done that would disturb the even progress and advancement which the Institute had shown. He was sure that the Institute had never stood better in public, in artistic, opinion than it did at the present time, and he hoped and believed that its position would be extended and increased; though he also believed that that could only be done by moderation. Towards the end of his presidency they had been engaged in the consideration of an important matter, but that matter had passed out of the hands of the old Council. He regretted, and they all regretted, the loss of many valuable members from that Council, and they looked to the new Council to carry forward the work in a way which would keep the Institute united if possible. Without that it was impossible for the Institute to do the work which it should do, and he was convinced, as a very old Institute man, that it was essential for architects that the Institute should be strong and respected both by members of its own body and by those outside it—not only by architects, but by the official and artistic world with whom they were brought into contact. That was a matter of politics. What they were all chiefly concerned in was the promotion of architecture and art—they should all try to do some little work to advance it.

The meeting then terminated.

THE GREEK PLAY AT BRADFIELD.

It is four years since the open-air theatre at Bradfield College was filled with spectators to witness a Greek play; the performances are professedly triennial, but in 1900 the proper date of performance was anticipated by a year, 1900 being a special anniversary in the history of the College. On Tuesday last, under fine though not brilliant weather, the theatre was again occupied by fifteen hundred spectators, to witness the first of a series of five performances of the *Alcestis* of Euripides.

We have before described the theatre, which in its plan closely follows the traditional Greek theatre plan, even to the rather un-practical rounding of the auditorium into a horse-shoe curve, from the end seats of which little can be seen of the stage. The fact that this form of plan was accepted seems to imply that to the ancient audiences the chanting and the evolutions of the chorus were the really popular part of the entertainment. The audiences at Bradfield College, however, are not of the popular element, and accordingly the management, while presenting to us the complete lines of a Greek auditorium, restrict their invitations to 1,500 for a *cavea* which really holds 2,000; leaving the end seats of the tiers unoccupied.

Alcestis was the play given on the last occasion also; one is always glad to see it again, it is a play so full of that kind of human pathos which no alteration of time and country can dull the edge of. Indeed, the parting scene between the dying Alcestis and her husband and children is so touching that if acted with the power and pathos that grown-up actors of genius could put into it, one feels that it would perhaps be almost too heartrending to witness. To imply that the actors at the school do not put all into such a scene that it is capable of is no disparagement; it is only saying that they are boys or youths and not men and women, and cannot have the feelings of more matured natures; indeed the part of Alcestis herself, with its exquisite tenderness, could only be adequately acted by a woman, and a woman of genius. But Mr. Richards gave a very carefully studied and refined presentation of the part, which was highly creditable. The best and most complete piece of acting of the play was perhaps that of the part of Admetus, by Mr. Scott; but we should also mention the short part of Thanatos by Mr. Simcox, which was very cleverly done, and really conveyed something of the weird effect which the figure of Death as an actual personage on the stage ought to produce; when he disappeared through the doors of the palace one felt that an evil thing had entered into the house. Mr. Robinson's Herakles was not, we thought, equal to the bustling Herakles of a previous presentation; he played the part rather too slow, so to speak. An impressive moment in the play was when the dead Alcestis is carried out on her bier and the procession walks round the orchestra and out at the side-scene; the dead silence of the audience, and the almost noiseless tread of the actors in their antique robes, produced for the moment an impression as if one were witnessing a scene in a dream.

The music for accompanying the play is now in the hands of Mr. S. J. Rowton, who, we are glad to see, admits, in his preface, that if we could hear the music actually sung and played at Athens 2,400 years ago, it would probably be, to our ears, not musical at all. There is, in fact, a good deal of nonsense talked about Greek music, of which, in spite of learned theorists, we really know nothing with certainty, beyond the notes of the scale, which are not exactly the modern scale, though they were the basis of it. Mr. Rowton, therefore, did not attempt the impossible task of manufacturing Greek music, but gave us something which, while sufficiently agreeable to the ear, was old-world enough to deceive one into feeling as if it were or might be ancient Greek; which is all that can be done.

In contemplating such a play as *Alcestis*, so full of passion and dramatic contrast, one cannot help wishing that it could be acted in Greek by a company of eminent actors, if they would face the task of getting up the Greek. It would be a great spectacle.

The translation into English, made by various members of the Sixth Form at Bradfield, shows a great deal of literary merit in places; perhaps the criticism that might be made is that there is a little too much of literary merit in some portions of it—*i.e.*, that it renders the original into the language of modern feeling a little too much to correctly represent the Greek.

That is perhaps inevitable; we may act and see a Greek play in the original, but that does not make us Greeks; and, indeed, we never see the Bradfield play without a curious speculation as to the difference, in all its thoughts and habits and associations, between the audience which saw it originally in Athens in the Vth century B.C. and the audience which sees it in the XXth century A.D., in a Berkshire chalk-pit.

Too much cannot be said in praise of all the arrangements for the transit and the convenience of visitors. That is one of the minor sources of satisfaction in going to the Bradfield play—everything is so admirably managed.

H. H. S

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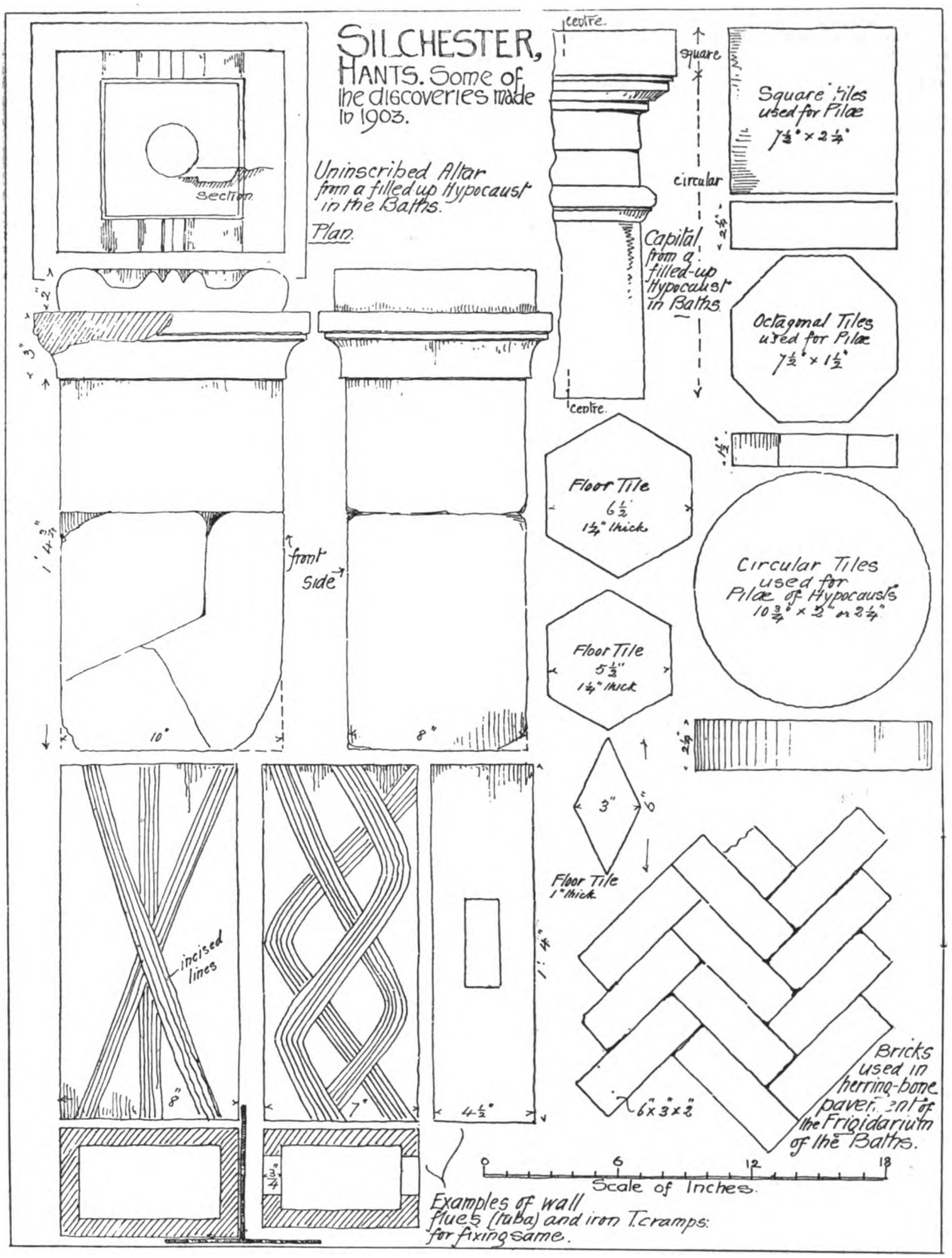

SKETCHES FROM THE SILCHESTER EXHIBITION.

WE described briefly last week the objects from Silchester which are on view at the rooms of the Society of Antiquaries. We now give a few sketches made from the collection.

THE BRITISH ASSOCIATION OF WATER-WORKS ENGINEERS.

THE annual meeting of the British Association of Waterworks Engineers was continued in the Council Chamber of the Town Hall, Hull, on Friday, June 10, Mr. F. J Bancroft, President, in the chair.

Air-lift Pumping Plant.

Mr. J. W. M. Richardson, Assoc.M.Inst.C.E., read a paper on the efficiency trials of air-lift pumping plant for the Corporation of Birkenhead. He said that in March, 1901, the Gas and Water Committee of the Birkenhead Corporation had to consider the question of taking immediate steps to increase the water supply in the area under their control. They had at that time a site known as the Ford Pumping Station, upon which was situated a borehole 800 ft. deep, 31 in. diameter for a depth of 150 ft. below the surface, and 24 in. diameter for the remaining depth, passing through marl beds for a distance of 765 ft. below the surface, and into the new red sandstone for a further depth of 35 ft. Between the marl beds and the sandstone a large fault was met with, and until this was reached no great quantity of water was obtained.

At the date mentioned, an old single-cylinder horizontal engine, with a pump of the ordinary type at a depth of 190 ft. below the surface, and capable of pumping about 3½ million gallons per week, had been installed for testing purposes. On the advice of the late Mr. W. A. Richardson, the committee decided to put down an air-lift plant for permanent use. The principal factors leading to this decision were the short time in which an air-lift plant of the required capacity could be delivered and erected, and the possibility of erecting the first set of plant previous to removing the old one.

The reservoir and tank at Flaybrick Hill, to which the water had to be conveyed, being about a mile from the pumping station, and at an elevation of 200 ft., force pumps had to be provided in addition to the air-lift plant, and tenders were invited for the delivery and erection of a duplicate air-lift and force-pump plant, each set having a capacity of 45,000 gallons per hour lifted from the bore-hole into a tank at the surface, and thence into the tank at Flaybrick Hill, the tender of Messrs. A. F. Craig and Co., Limited, of

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Paisley, being accepted. The air-compressor cylinders were 12 in. and 24 in. diameter respectively for the high and low pressure air, and 15 in. and 28 in. diameter for the high and low pressure steam, and having a stroke of 30 in., were cross compound, and mounted on hollow cast-iron bed-plates, one for each line of the engine, the centres being 7 ft. apart. The air-cylinders were in front of the steam-cylinders, a piston rod 3 in. diameter passing through both to the cross-heads. The steam cylinders were fitted with ordinary flat surface slide valves, the high pressure having cut-off expansion gear. No steam jacketing was provided, but the cylinders were lagged with mahogany and sheet steel, with non-conducting composition underneath, and a 1½ in. valve was provided between the steam chest and the cylinder on the high-pressure steam cylinder for warming up and starting purposes. The air cylinders were water jacketed throughout. Between the low-pressure air discharge and the high-pressure air suction, an intermediate receiver 15 in. diameter by 8 ft. 6in. long, fitted at a height of 5 ft. 4 in. above C.L. of engine, and contained a water coil for cooling purposes, consisting of 82 ft. of 1¼ in. bore, malleable iron pipe, with connexions through the end covers. The suction valves for the high-pressure air-cylinder were four in number, and were fitted on top of the cylinder, two at each end. An air-space, 6 in. by 2¼ in., was cast along the top side of the cylinder in communication with the intermediate receiver, and acted as a casing for the valves, which were accessible through cast-iron screw plugs 4 in. diameter. The valves were of steel with gunmetal seats screwed into the cylinder body, and are fitted with springs and adjusting nuts for regulating the tension. Collars were keyed on to the valve spindles, which allowed the valves a lift of $\frac{1}{16}$ in. Perforated plates were fitted to the recesses on the cylinder covers, to act as guards, and prevent anything falling into the cylinders in case of a broken valve. The high-pressure air-discharge valves were of the barrel pattern, 2½ in. diameter, and having four bearing strips which keep the valve central on its seat. The barrel portion of the valve was 2¼ in. diameter, and, with the exception of the strips, which were ¼ in. wide, a clear space of ⅛ in. all round the valve was available as air space. The valve seat was 3¼ in. above the bottom of the barrel, and the pressure of the spring which closed the valve was applied internally at the bottom, thus ensuring the valve returning properly to its seat after each lift. The lift of the valve was the same as the suction valve—viz., $\frac{1}{16}$ in.—and guards were fitted similar to those on the suction valves. The valve and seat were both of gunmetal, and the air discharge takes place into a similar space to that containing the suction valves, the arrangements for inspection, etc., being also similar. In the low-pressure air-cylinder the arrangement of valves was somewhat different, as they were fixed in the cylinder covers. The suction and discharge valves were the same as those in the high-pressure air-cylinder, with the exception that the barrel in the discharge valve was not quite so long. There were five suction and four discharge valves at each end of the cylinder; a passage 8 in. by 3 in. terminating in an 8 in. diameter opening forming the suction The delivery takes place into a similar passage cast on top of the cylinder, to which the intermediate receiver was connected. Besides being bolted down to the frame beds, the cylinders were stayed by means of 1½ in. diameter bolts, with turned cast-iron distance pieces to bracketed lugs cast on the cylinders. The water circulation through the various cylinders, covers, and receiver was provided for by a 1½ in. branch from the force-pump discharge (on the delivery side of the air-vessel), which divided at the compressor, one connexion being carried to the front cover of the high-pressure air-cylinder jacket, and back cover, and passing thence to the tank, the other being connected to the front cover of the low-pressure air-cylinder, the water circulating through the cover, cylinder jacket back cover, and the intermediate receiver. The total quantity of water used for cooling purposes amounted to about 500 gallons per hour. The engine speed was kept at 48 revolutions per minute by means of a Pickering governor. The steam-pipes were 4 in. diameter. The force pumps were of the ordinary horizontal non-rotative Blake-Knowles type, having cylinders 10 in., 16 in., and 25 in. diameter, and 18 in. stroke, the plunger being 14 in. diameter. The suction and delivery pipes were 12 in. and 10 in. diameter respectively, and the steam connexion was 3 in. diameter. The condensers were of the Wheeler Admiralty pattern, 28½ in. diameter, and 6 ft. 10 in. between the tube plates, and were supported on wrought-iron pipe columns to allow of the air-pump being placed underneath. The tubes, 433 to each condenser, and ¾ in. diameter, were of tinned copper, fixed into the tube plates with ferrules and cotton packing, and the whole of the water delivered by the force pump circulated through the condens r tubes so that no separate circulating pump was needed. The air-pump was of the non-rotative horizontal type, having steam-cylinder 6 in. diameter, air-cylinder 10 in. diameter, and both 12 in. stroke. When working under ordinary conditions, the water-level in the bore-hole averaged about 198 ft. below the centre of the discharge. The water, after being delivered by means of the compressed air into the tanks at the surface, was picked up by the force-pumps and delivered through about a mile of 15 in. main into the high-level tank, whence it flowed by gravitation into the town. Steam was supplied from three Lancashire boilers, each 30 ft. long by 7 ft. diameter, the main steam-pipe in the engine-room being fitted with a "Holder and Brook" steam-drier. The following particulars of the actual cost of working the plant for a period of seventeen months ending January 31, 1904, would be of interest: Cost of pumping from September 1, 1902, to January 31, 1904—oil waste, packing, and all other materials, 552*l* 14s. 8d; coal and slack (average cost, 10s. 10d. per ton), 1,636*l* 17s. 10d.; wages, 1,152*l* 16s. 5d.; total, 3,342*l* 8s. 11d. Water pumped, 317,128,000 gallons; total head, 350 ft.; cost per 1,000 gallons pumped, 2·52d.; cost per 1,000 gallons raised 100 ft. high, 0·72d.

In the discussion which followed, the general opinion expressed was that an air lift pumping system was not equal in efficiency or economy to high class pumping engines, and that its installation could only be justified where the special circumstances were unfavourable to an ordinary pumping plant.

Geology Structure of South-East Yorkshire.

Mr. Percy F. Kendall, Lecturer on Geology in the University of Leeds, read a paper on the "Geology Structure of South-East Yorkshire." He said the great county of Yorkshire was divided into three administrative areas—the Thriddings or thirdings of the early inhabitants, now modified into Ridings.

For the purposes of geological description the county might also be divided in tripartite fashion, though only one of the divisions coincided approximately with an administrative area. The geologist would draw a sinuous boundary line passing through Doncaster, Tadcaster, and Ripon to Darlington, which would mark the eastern edge of the Magnesian Limestone outcrop, and thus separate an area of Palæozoic rocks from one of Neozoic. The eastern region might then be transversely divided by the great low valley—the vale of Pickering—into, broadly, a Cleveland area and a Wold area from the two principal hill regions respectively included. The broad, low valley of the Ouse was excavated in the soft Triassic sandstones and marls, but the extremely low relief was attributable not merely to the softness of the rocks, but to the covering of glacial and post-glacial deposits which mantle and almost obliterate the features of a more undulating surface of the solid rocks. The vale of Pickering was a faulted trough of Kimeridge clay; but here again the low relief was rendered still lower by a flat expanse of more modern accumulations in part of glacial and for the rest of post-glacial age. The Howardian Hills, which close in the vale of Pickering on the west, were formed by the outcrop of much faulted and shattered Lower and Middle Oolites, in which hard rocks, such as sandstones and limestones, predominate. The Wolds were formed by the outcrop of the chalk. Holderness was underlain by chalk worn down to a plain of marine denudation, but the surface was composed of glacial deposits disposed very largely in long mounds and ridges running in rough parallelism to the coast. The glacial deposits were of great interest and of much practical importance. To consider the case of Yorkshire: a great glacier at first emerged at the mouth of the Tees, but when its progress was obstructed by the great ice sheet it was deflected down the vale of York, receiving tributary glaciers from the valleys of the Swale and Ure, and left at its melting place a crescentic ridge of rubbish to form a rampart across the valley at Escrick, between York and Selby. At a later stage, when this ice was shrinking, it threw down another great ridge, upon which the city of York now stands. Along the Yorkshire coast, the great ice sheet filling the North Sea abutted and invaded the land to a distance roughly proportionate to the elevation and practicability of the country, where the ground was low and smooth, reaching a long way in, but making little progress where the seaboard was bold and lofty. Near Scarborough the ice advanced only three or four miles on to the land, but in the low vale of Pickering it intruded much further. In the Holderness region its effects were very striking and of immense importance. Before the glacial period there was no Holderness, but a great shallow bay with a smooth chalky floor, and bounded by chalk cliffs extending from the neighbourhood of Bridlington, by Driffield and Beverley, to Hessle, three or four miles west of Hull. The old cliffs buried behind and beneath the glacial deposits could be seen at the two extremities, and they could be traced by borings at many intermediate points. On the eastward side of these cliffs vast quantities of glacial clays, sands, and gravels were piled on the old sea bottom so as to add a large tract—Holderness—to the land surface, but the sea-floor of characteristic form and slope still existed. The ice sheet seems to have advanced far up the slopes of the Wolds, and its extension was everywhere characterised by the deposits and by the occurrence of stones alien to the district, whose distant homes could be placed with certainty in Sweden and Norway and the hilly regions of the north of England and the south of Scotland.

On the proposition of the President, a hearty vote of thanks was accorded to Professor Kendall.

THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

III.—PENSHURST.

No subject for research is fraught with keener interest than the evolution of domestic architecture in this country. Of the earlier houses now remaining, few have escaped the inevitable process of alteration; but Penshurst Place, which was visited on Saturday, the 18th inst., by the Architectural Association, stands to-day very much in the condition that the XIVth century builders left it, and is indeed the embodiment of all that reflects the life and character of an English domestic establishment of the middle ages. The subject is, perhaps, too well known to require anything beyond remarks of a general nature upon the present occasion.

The scale of the house is larger than in contemporary houses such as Haddon Hall, where the building was planned to suit the site; but at Penshurst the position does not appear to have presented restrictions in boundaries. Local stone is practically used throughout the earlier parts, where the walls have very pleasing texture and colour and it is instructive to observe the use of heavy relieving arches over the heads of traceried windows and other openings in a manner befitting the uncertain qualities of the material. Brickwork was employed in subsequent extensions in Tudor times, but a reversion to stone was made in the XVIIIth century, as seen by the classic features of the end windows of the Long Gallery. Rumour says that there is now a proposal to replace these insertions by windows of the original character; it is sincerely to be hoped that such is not the case.

The famous banqueting hall, with its large span timber roof and central fireplace, needs no description; we may, however, remind our readers of a delightful representation of its interior by Nash in his "Mansions."

The history of Penshurst is, in a sense, the history of England. The visits of various Kings and Queens are recorded in the walls as much as by documentary evidence. Ascending a beautiful stone-vaulted stair, a suite of state apartments is reached, of which the Ball Room, Long Gallery, and Queen Elizabeth's Drawing Room are the more important chambers. The latter room has the upper part of its walls covered with tapestry, arranged upon a basis of panelling. The framing consists of a rich dull green brocade; the borders, which correspond with mouldings, are ornately worked, whilst the panels contain geometric designs in which a sparing use of red is made; but the

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general colouring is subdued, and the whole scheme is unique and at the same time entirely successful.

It is to be hoped that the lesson of this design in the application of textiles will be revived, in preference to the large scaled and confused figure compositions which have hitherto characterised tapestry decorations.

It is remarkable that the few discordant notes in the harmonious composition of this great house should have been struck in the XIXth century, where certain works of restoration have been attempted, and have resulted in signal failure. The situation is, however, saved to a large extent by the formal gardens, which were laid out about the same time—1871—by the late George Devey, and it is instructive to consider the rapidity with which the yew hedges and other growths have reached such luxurious dimensions. The principal garden, on the south front of the house, is devoted to flowers, arranged in four sunk plots laid out with yew borders in parterres. A large basin, with fountain, is placed at the intersection of the four main paths, and tall yew hedges with pediment shaped features enclose the garden on the south and east boundaries. Smaller gardens are arranged outside the latter, beyond which are kitchen gardens. The whole lay-out is a distinct success, wherein much of the spirit of the old craft is obtained; there are long alleys, grass walks, and quaint surprises, but the parallel setting of the main lines which is emphasised by the yew hedges is perhaps monotonous.

The remainder of the visit was spent in hurriedly viewing the church and also some charming Kentish domestic work in the village.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. Cornwall, Vice-chairman, presiding.

School Buildings and Contracts.—Alderman Dew asked the Chairman of the Education Committee if the Council's 20-mile radius could be included in the form of contract for school building work in place of the 12-mile radius of the late School Board.

Sir W. Collins said that apart from the radius the School Board form of contract contained provisions similar to those in the Council's form. He would answer the question in the affirmative, provided that such alteration did not interfere with works in progress.

The Education Committee recommended and it was agreed that, until the first meeting of the Council after the summer recess, contracts for work of an urgent character, not including new schools, or work on new schools (unless required to complete new schools nearing completion), be entered into on the forms of contract and specification used by the late School Board for London; that the work be carried out under the direction of Mr. T. J. Bailey; and that the Education Committee be empowered to invite tenders for the execution of such work from the selected list of contractors of the late School Board.

The following recommendations were also agreed to:

That the Board of Education be informed that the Council is of opinion that it is desirable that the scheme of alterations and improvements proposed to be carried out at the High-street school, Stoke Newington, for which tenders were received by the late School Board, should be proceeded with. [Messrs. J. Chessum and Sons: 5,133*l.*]

That the Board of Education be informed that the Council is of opinion that the proposed improvements at the Shap-street School, Kingsland-road, for which tenders were received by the late School Board, should be proceeded with. [Messrs. J. Chessum and Sons: 11,651*l.*]

That the clerk of the Council be authorised to sign, on behalf of the Council, the contract with Mr. E. Triggs, as drawn up by the officials of the late School Board, for carrying out a scheme of improvements at the Buckingham-terrace School, North Kensington, the tender for which amounts to 5,067*l.*

Proposed Woolwich Tunnel.—The Bridges Committee recommended that the Council should seek parliamentary powers in next session for the construction of a footway tunnel, similar to the Greenwich tunnel, to connect North and South Woolwich under the Thames. The cost of construction was estimated at 145,000*l.*, and the annual cost of maintenance at 2,500*l.*

Lord Welby, on behalf of the Finance Committee, moved, as an amendment, that the matter be referred back, on the ground that the capital commitments of the Council rendered it inexpedient to proceed with the work until the completion of Rotherhithe Tunnel and Vauxhall Bridge.

After a long discussion the Council divided: For the amendment, 71; against, 41.

The recommendation was accordingly referred back.

Victory Bridge, Ben Jonson-road.—The same Committee recommended and it was agreed after discussion, that, subject to a contribution by the Council of the Metropolitan Borough of Stepney of one-fourth of the net cost of the improvement, such contribution not to exceed 4,250*l.*, powers be sought in the session of 1905 to enable the Council to reconstruct Victory-bridge, Ben Jonson-road, in general accordance with the plan "B" presented to the Bridges Committee on 22nd July, 1903.

Ventilation of Committee Rooms.—On the recommendation of the Establishment Committee it was agreed that expenditure not exceeding 645*l.* be authorised for the purpose of providing ventilation for the committee rooms, etc., at the county hall, being 300*l.* for providing and fixing the fans, wiring, and fittings, 300*l.* for tubes, ducts, and other fittings, cutting away walls, etc., and 45*l.* in connexion with the ventilation of the members' lavatory and tea-making room; and that the work of cutting away walls, floors, ceilings, etc., be referred to the Works Committee to carry out as a jobbing work.

The Valuation Bill.—The Parliamentary Committee reported upon the Valuation Bill, and recommended:—"(*a*) That the principle of the Valuation Bill, 1904, be approved. (*b*) That, in the opinion of the Council, the constitution, powers, and duties of assessment committees should remain as at present, with the following alterations—i., That the London County Council should, as proposed by the Bill, be the valuation authority for the County of London, with power to make by-laws for securing uniformity of practice in valuation; ii., that the assessment committees should be appointed by the metropolitan borough councils in every instance; iii., that the assessment of all property belonging to local authorities (except that of the London County Council and of railway, gas, water, and similar undertakings) should be transferred to a central assessment committee appointed by the London County Council, such committee to have the same powers, rights, and duties as other assessment committees, in relation to matters with which it is concerned; iv., that, in the opinion of the Council, all questions relating to the rating of Government property should be referred to the central assessment committee appointed by the London County Council. (*c*) That, in the opinion of the Council, it should be empowered to send an officer to sit with each local assessment committee, with functions analogous to those of surveyors of taxes, but not limited to gross value. (*d*) That, in the opinion of the Council, machinery, similar to that of the County Rates Act, 1852, should be provided in the Bill for the purpose of the proper co-ordination of totals. (*e*) That the Parliamentary Committee be instructed to endeavour to secure such amendments in the Valuation Bill, 1904, as will give effect to the before-mentioned proposals."

This was adopted, and the Council soon after adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Brixton.—That the resolution of April 26, consenting to the erection of a one-story office building at No. 175, Ferndale-road, Brixton, in accordance with the plan submitted with the application of Mr. W. H. Duffield, on behalf of Mr. D. Greig, be rescinded.—Agreed.

Rotherhithe.—That the resolution of March 15, consenting to the erection of an iron shed on the north side of Rotherhithe-street, Rotherhithe, in accordance with the plan submitted with the application of Messrs. Croggon and Co., on behalf of Messrs. Quirk, Barton, and Co., be rescinded.—Agreed.

Lewisham.—Wooden overhanging eaves, barge boards, and pents to five houses on the north side of Ewkhurst-street, Lewisham, between Crofton-park-road and Salehurst-road (Messrs. J. G. Nicolls and Son).—Consent.

St. Pancras, South.—A one-story shop upon part of the forecourt of No. 334, Gray's-inn-road, St. Pancras (Messrs. Willis and Leslie for the Rev. A. Baker).—Consent.

Norwood.—Additions in front of Nos. 9, 10 and 11, Benton's-lane, Gipsy-road, Norwood (Mr. J. Redwood).—Consent.

Westminster.—Stone columns, under existing stone balconies, in front of "Albert-court," Prince Consort-road, Westminster (Mr. R. J. Worley for Mr. W. H. Dunn).—Consent.

St. George, Hanover-square.—Permission to retain a glass show-case at No. 84B, Piccadilly, abutting upon Clarges-street, St. George, Hanover-square (Messrs. Rohan and Co.).—Refused.

Lewisham.—Buildings on the east side of Bromley-road and south side of Sangley-lane, Catford (Mr. A. W. Osborn for Mr. J. Watt).—Refused.

Wandsworth.—Houses on a site abutting upon the southern side of Coverton-road, Tooting, and western side of Condy-road (Mr. W. C. Poole for Mr. H. Keen).—Refused.

Width of Way.

Woolwich.†—The erection of Nos. 21 and 23, Pound-place, Eltham, with the forecourt fences at less than the prescribed distance from the centre of the roadway of the street (Mr. G. Rathbone).—Consent.

Width of Way and Line of Frontage.

Hampstead.—Buildings with shops upon the forecourts of Nos. 319, 321, and 323, West-end-lane, Hampstead (Messrs. T. H. and A. M. Watson for Mr. J. Phillips).—Refused.

Formation of Streets.

Hampstead.—That an order be issued to Messrs. Farebrother, Ellis, and Co., refusing to sanction the formation or laying out of a new street for carriage traffic, to lead from Redington-road to Bracknell-gardens, Hampstead (for Sir Spencer P. M. Maryon-Wilson, Bart.).—Agreed.

Formation of Streets and Width of Way.

Bermondsey.—That an order be issued to Mr. T. J. Bailey sanctioning the formation or laying out of a new street, for foot traffic only, to lead from the north-eastern end of Westcott-street to Pardoner-street, Southwark, and the erection of boundary walls on the north side of Westcott-street and south side of Pardoner-street, Southwark (for the Education Committee of the Council).—Agreed.

Space at Rear.

St. George, Hanover-square.—A modification of the provisions of section 41, with regard to open spaces about buildings, so far as relates to the proposed erection of shops and residential flats on a site abutting upon Buckingham-palace-road, Eccleston-street and Eccleston-street East, St. George, Hanover-square (Messrs. Read and MacDonald for Messrs. Holloway Brothers).—Consent.

Holborn.—A modification of the provisions of section 41, with regard to open spaces about buildings, so far as relates to the proposed erection of buildings (block "B") upon a site abutting upon Vine-street and the eastern side of Shaftesbury-avenue, Holborn, with irregular open spaces at the rear (Mr. R. J. Worley for the Shaftesbury-avenue Freehold Land Syndicate).—Consent.

Buildings for the Supply of Electricity.

Strand.—A deviation from the plans approved for the conversion of a generating station at Maiden-lane, Strand, into a distributing station so far as relates to an alteration in the form and construction of the roof (Mr. W. B. Pinhey for the Charing Cross and Strand Electricity Supply Corporation, Ltd).—Consent.

Deviation from Certified Plans.

Whitechapel.—Certain deviations from the plans certified by the district surveyor under sections 13 and 43 of the Act so far as relates to the proposed rebuilding of the "Ben Jonson" public-house, No. 22, Goodman's-yard, Minories, Whitechapel (Mr. J. P. Choate for Mr. J. Webster).—Consent.

Dwelling-houses on Low-lying Land.

Peckham.—That a licence be granted under sections 122 of the Act, to Mr. W. Barbut for the erection of two houses on low-lying land, situated at Peckham-park, S.E. (Mr. E. Crosse on his behalf).—Consent.

The recommendation marked † is contrary to the views of the local authority.

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ARCHITECTURAL SOCIETIES.

SHEFFIELD ARCHITECTS AND SURVEYORS.—Upwards of fifty members of the Sheffield Society of Architects and Surveyors visited Roche Abbey on Saturday last. The ruins of the abbey and the site of the ancient monastery formed the subject of an interesting description given by Mr. J. R. Wigfull. Luncheon was served in the abbey grounds, the party afterwards driving to Laughton-en-le-Morthen, where the vicar (Rev. Thomas Rigby) gave to the visitors a short history of the church, and also described its principal architectural features. The reverend gentleman also showed them the site of the Saxon earthworks, or encampment. Tea was served in the schoolroom by the kindness of the vicar, who was accorded a hearty vote of thanks, on the proposition of Mr. T. Winder, President of the Society, seconded by Councillor W. C. Fenton, Hon. Secretary.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The concluding meeting of the session was held at the rooms in Sackville-street, on the 15th inst., Mr. C. H. Compton, V.P., in the chair. The Rev. Dr. Astley exhibited a curious volume of sermons which were preached at East Rudham during the period of the Commonwealth, entitled "Præterita, a summary of sermons by John Ramsay, minister of East Rudham, printed by Thos. Creake, for William Reade, at his house over against ye Bear Tavern in Fleet-street, 1660." Mr. Kershaw said the dedication of the first sermon in the volume to Mr. James Duport offers interesting data as to the family of Duport who had settled in East Anglia, as refugees from France. The name Duport has also been connected with Caius College, Cambridge. The sermons preached in Norfolk would naturally lend themselves in dedication to one of a noted local family. Mr. Patrick, Hon. Secretary, exhibited, on behalf of Mr. Winder of Sheffield, a curious earthenware water pipe, about 12 in. in length and 4 in. in diameter externally. Each pipe at one end is shouldered to form a neck 3 in. in diameter for insertion into the next pipe, where they were joined by a very hard cement. The pipes are of a rich brown glaze outside, very like Brampton ware, but, where fractured, the section shows a close-grained bluish earthenware. At the thick end of some of them there is a narrow band, sunk, about $\frac{3}{16}$ in. wide and half that in depth, having raised dots about 6 to the inch in the circumferences. About 3 in. from the neck the pipe is rough, of the rest of the length to the band, the surface is quite smooth. A broken pipe shows the interior to have corrugations more or less spiral, like the thread of a screw, the corrugations being about $\frac{1}{4}$ in. from ridge to ridge. Some 20 or 30 of these pipes were dug out of an old cart-track 7 to 8 ft. below the general level of the ground, the pipes themselves being from 2 to 3 ft. below the track level, in Canklow Wood, near Rotherham. The site is within a mile of Templeborough Roman camp, but, whether they had any relation to the camp or are of Roman or mediæval design, there is no evidence to show. A paper was read by Rev. Dr. H. J. D. Astley upon a subject which, at first sight of the title, would seem to have but little relation to archæology, viz., "Was Primitive Man Ambidexterous?" but in the sense in which he employed the term the paper was instructive and interesting. He deduced from the many implements discovered in Kent and in France and elsewhere belonging to the so-called Eolithic, but which he preferred to call the "Proto-Palæolithic Age," adapted for use by the left hand and almost as numerous as those for use by the right hand, that from the earliest period man was an ambidexterous being. As we descend the stream of time to the dawn of history we find man continuing to use both hands impartially. Palæolithic man in his artistic representations of animals, birds, etc., drawn on rock and pieces of bone with equal facility from both left and right, must have been ambidexterous, although in warfare he had begun to use his right hand for offence and reserve the left for purposes of defence. The Neolithic Age affords evidence in the pounders, borers, knives, scrapers, and hammers, that for purposes of domestic life man still used both hands indifferently. In the Bronze Age all weapons were hafted, so there is no actual evidence forthcoming as to the use of the left hand, but, that the right hand had not yet finally obtained the victory might be deduced from the fact that the Semites, Greeks, and Romans, at least apparently, wrote first by preference with the left hand, and that the early Greeks and Romans wrote impartially with both. It was not until well within the historic period that the right hand finally achieved the predominance it has held to the present day. Mr. Cheney, Mr. MacMichael, the Chairman, and others took part in the discussion which followed the paper.

ENGINEERING SOCIETIES.

THE JUNIOR INSTITUTION OF ENGINEERS.—On Tuesday evening, June 14, a visit of this Institution took place to the Motor-car Works of Messrs. D. Napier and Sons, Acton Vale. The attendance was exceptionally numerous, upwards of 120 being present. Under the guidance of Mr. R. B. A. Ellis (member of the Institution) and others of the staff, the party, divided into groups, were shown over. Special attention was devoted to the testing-room, where several engines were shown under process of testing. The works consist principally of one large building on the ground level, 282 ft. by 124 ft., more than half of which is used as a machine shop, and the remainder for an erecting shop, where the cars reach their final stage before being tested. The central portion of this building is used as a store. The other smaller shops consist of a foundry, smithy, motor-testing house, pattern makers' shop, etc., arranged in separate buildings. Motors are made in several types, from the 15-h.p. four-cylinder to the 100-h.p. racer, besides marine motors in several sizes. A new type of motor has recently been introduced with six cylinders, cast in three parts and mounted on an aluminium crank-case. All work is finished to gauge. Motive power is obtained from an 80-h.p. Westinghouse three-cylinder gas engine and a two-cylinder engine of the same make. The next visits of the Institution will take place on Saturday, the 25th inst. (to-day), when the Chelsea Generating Station of the Underground Electric Railway and the L.C.C. Pumping Station in Lots-road are to be seen; and on Saturday, July 9, an excursion is to be made to Dover. The new turbine steamer *The Queen*, the Admiralty Harbour Works, and the works of the Dover Harbour Board are included in the programme, and in the afternoon the Mayor and Mayoress of Dover will receive the Institution at the Town Hall.

PLENUM VENTILATION AND THE ROYAL VICTORIA HOSPITAL, BELFAST.

THE following is the joint reply by Mr. Wm. Henman and Mr. Thos. Cooper, architects, and Messrs. Henry Lea and Son, consulting engineers, to the criticisms on the plenum ventilation and the Royal Victoria Hospital, Belfast, at the recent meeting of the Royal Institute of British Architects, as reported in our issue of the 11th inst.

"In consequence of the late hour at which this discussion was taken on the 6th inst., it was impossible for us then to reply; but, with the sanction and approval of the President, we now do so as briefly as the importance of the subject will allow. We welcome such minute inspection as that made by Mr. Pick, because, when undertaken with an open mind, it is likely to extend appreciation of the possibilities of plenum ventilation for hospital purposes. We put forward no claim to having arrived at perfection in plan, and are not surprised that so novel an arrangement of wards calls forth criticism, notwithstanding that those who have had to serve in or occupy the hospital are perfectly content with the facilities for administration, and its comfort and cheerfulness.

The exceptional conditions demanded special treatment as regards drainage. All drains are kept well below the floor level of the air ducts, which are by no means the dark, damp places some seem to suppose. The City Building Surveyor of Belfast took a broad view of the subject and advised we should have a free hand with the drainage. The object aimed at was to convey from the buildings, as quickly as possible, all foul matter and waste waters, and so prevent the generating of offensive gases on the site. The multiplication of traps, manholes, and gullies was advisedly avoided; the drains run in long straight lines, they are thoroughly ventilated, and there is ample flush for cleansing them. Soil drains are distinct from wastes.

On inquiry, we find that a few of the calked lead joints to vertical waste pipes have slightly given, and we are obliged to Mr. Pick for detecting that fault, because means will now be taken to obviate it in future; but we venture to say that no harm would in this case result, as the pipes are of thick metal, in short lengths, easily got at, and quite away from any opening into the hospital; such pipes are safer and can be more readily inspected and joints made good, if necessary, than as usually provided for hospitals, viz., in long lengths of thin metal, with many inaccessible joints, and others in quite close proximity to windows.

Mr. Pick's sentimental objection to washing-up sinks in sanitary turrets is not only applicable to this hospital; the arrangement, however, is found to be convenient in practice and is not complained of by the nursing staff. If there were difficulty in keeping milk fresh, as things are in this hospital, his criticism would be reasonable; but this, together with his wish for open windows, evidently proves that Mr. Pick has not yet fully grasped the possibilities and requirements of plenum ventilation.

Successful application of the system implies that continuously, year in and year out, sufficient change of air shall be secured throughout the building. Where, then, is the necessity for open windows by which air can only be admitted proportionately to the force of wind outside or to difference of temperature within and without? Mr. Pick was hypercritical in his remarks on the details of engineering. Although there are no outer doors to the stoke hole, he may not have noticed that only the fronts of the boilers are exposed, the wall above being entirely built up, access to the space above the boilers being from the pump-house—a much more cleanly arrangement than having the tops of the boilers open to the stoke hole.

At this time of year, when no heating of the building is required, the feed-water for the boilers would be nearly cold, because little or no condense water is going back to the hot-well, and all the exhaust steam from the engines is usefully engaged in providing the hot-water supply throughout the hospital. There must be a receptacle of some kind for the condense water flowing back from the various steam traps. Whether or not this receptacle takes the exact form of the hot-well that we have provided seems to us to be immaterial.

With regard to the exhaust steam from the engines going to waste, this is not the case. The exhaust from the fan engine is used for the hot-water supply to the hospital, and the exhaust from the laundry engine is used for heating the water for the laundry, and the surplus from the calorifier goes to heat the coils in the drying-room.

Mr. Pick thinks that there are too many steam traps, but if he were to go carefully into the matter, he would find that the number could not with advantage be reduced. The question of generating electricity on the site was duly considered and abandoned in consequence of the greater cost and less efficiency than the arrangement adopted.

Mr. Saxon Snell's remarks can scarcely be taken seriously, and were evidently justly appraised by subsequent speakers. In contrast therewith, we commend the more thoughtful views expressed by Dr. S. Rideal and the Rev. J. B. Lock, because, with greater practical experience, their opinions may become more definite and serviceable.

Mr. Harold Griffiths questioned the employment of fixed screens of cocoa-nut fibre, but the experience of ten years confirms us in their use. If of ample area, periodically cleansed and renewed, they are suitable and efficient, and far more simple and serviceable than when made to revolve, because then they either become over-saturated with water or imperfectly cleansed.

When made in sections, as at Belfast, cleansing and renewal are easily effected at much less cost than can be done with revolving screens, to say nothing of the additional cost incurred by causing them to continuously revolve. Heating coils should certainly be kept clean; we always arrange so that they can be, and are regularly cleansed as well as the air ducts.

When open fires are employed chimneys have to be swept, grates cleaned, and works of repair and renewal from time to time effected, which probably involve greater labour and expense than is required for cleansing and maintaining suitable appliances for securing plenum ventilation with heating.

Mr. Max Clarke errs in advocating air chan-

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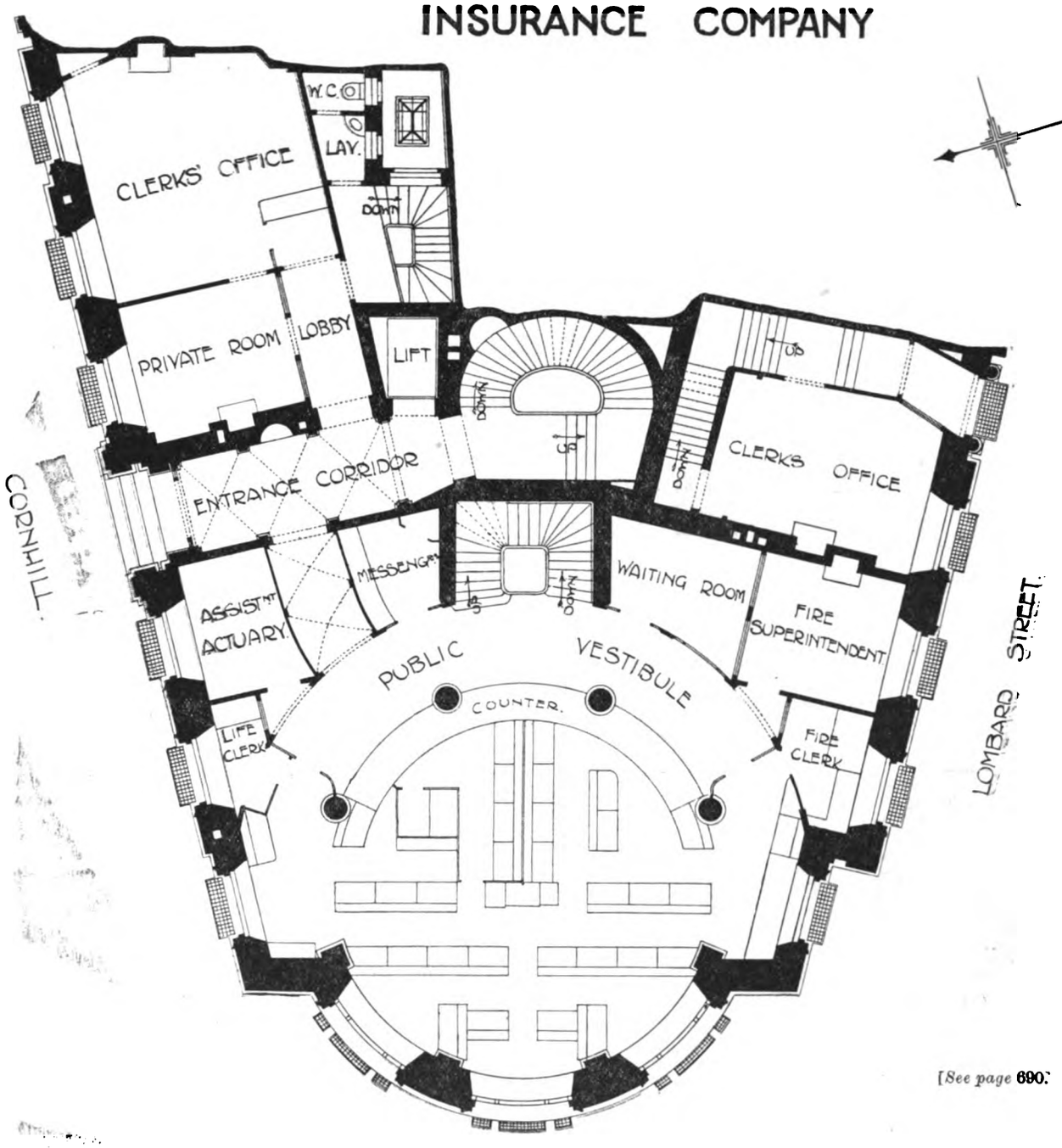
LIVERPOOL AND LONDON AND GLOBE INSURANCE COMPANY



[See page 690.]

PLAN OF THE GROUND FLOOR

SCALE OF 10 5 0 10 20 30 40 50 FEET.

nels of metal or lined with glass or vitreous enamel; such materials are costly, and in many respects unsuitable. Good plain brickwork in ducts of ample proportion, is economical and thoroughly serviceable.

It is surprising that Mr. A. E. Munby has not come across buildings in which the furnace to the heating apparatus is used for extracting some of the air from the interior of the building. It may be better than trusting altogether to chance; but, if he wishes to realise the value of the arrangement, we suggest he should calculate the cubical capacity of a building—say, a church—and ascertain the volume of air passing through the furnace flue in a given time; he may be surprised to find how long it takes to cause a single change of air in the church. He may also take into consideration the fact that probably for six months in the year there will be no fire in the furnace, just when change of air within the building is most required.

If those who question whether advocates of plenum ventilation pin their faith on the admission of air to the upper portion of an apartment and its exit near the floor level carefully read Mr. Henman's paper, they will scarcely fail to understand why that arrangement accords with nature's method, and is, therefore, preferably followed.

It is difficult to understand why the speakers who advocated plenum ventilation for assembly-rooms, schools, and even for operating rooms, question its utility in hospital wards; because, even in hospitals erected on the most approved pavilion plan, complaints of defective ventilation are common, particularly at night and in the early morning. Unfortunately, hospitals are rarely visited by architects or the public at such times. But go to the General Hospital, Birmingham, or the Royal Victoria Hospital, Belfast, at any hour of night or day or any day of the year, and it will be found that uniform temperature and freshness are maintained, to say nothing of freedom from draughts and of the noise, dirt, irregular heating, and attention required when open fireplaces are employed.

Expense, as the President intimated, is certainly an important item in connection with any system of ventilation and heating. Our endeavour has been so to simplify hospital planning, and adapt appliances for heating and ventilation, that at Belfast the initial outlay and cost for maintenance are very considerably below those of any other similarly complete hospital.

The deductions of Mr. Geo. H. Bibby [published in the *Institute Journal*] are so obviously unreliable that it is not necessary to take up time to do more than state that we communicated them to the superintendent of the hospital, and here give his reply, viz.:—

'The general health of the hospital establishment is excellent (*twice underlined*). I cannot trace the doctor who is alleged to have said the hospital always gives him headache. I have twelve doctors and medical pupils in residence, and all, except one, are in excellent health, and the hospital had nothing to do with that one man's state of health.

'The nurses, too, are in far better health than they were before we came here. I have that from the doctor who attends them.

'Why don't you propose to the R.I.B.A. to send a small deputation here to inquire

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into the whole question on the spot? What all should desire to know is the truth—whether plenum ventilation is a success, and worthy of adoption, or not; and, in no other institution can that be better ascertained than here, where a very fair idea can also be obtained of the cost, which is a matter of great importance.'

He has also given us full particulars *re* the amount of coal consumed, and the number of residents in the old and new hospitals, which entirely disprove Mr. Bibby's statements. For the year 1902 it was 516 tons for 190 residents in the old building, where the heating and hot water supply were very idadequate, and only the linen from small fever wards was washed on the premises.

In the new buildings the heating, ventilation, and hot water supply are ample for the full complement of about 400 residents, although at present there are only 300. There is also a complete laundry, in which all the washing is done on the premises; on the basis of eight months' coal consumption, it is estimated that it will not exceed 1,800 tons for the year—by no means a proportionately unreasonable amount for the effective work accomplished in an establishment so much larger than the old one. We hope that Mr. Bibby may be more accurate in the information he is collecting for publication *re* the heating and ventilation of hospital wards, or it will be of no practical value.

In conclusion, we do not expect our work to be above criticism. Diversity of opinion there is sure to be. Most of us have probably learnt that what we once thought impossible, or at least unlikely, has actually come to pass, and that appliances and processes have become practically useful, and a commercial success, in consequence of slight improvements in parts. If, therefore, plenum ventilation be accepted in principle, its public utility really depends on the careful adjustment of details and of full knowledge of the best methods for securing desired results.

Every installation, no matter how badly proportioned, in which air is forced through a building, is called 'Plenum Ventilation,' but air at a high temperature forced along small ducts and through buildings by high speed fans, cannot, as regards efficiency, be compared with the low temperature, spacious ducts, and slow speed fans adopted at Belfast. Bad examples have brought condemnation upon the plenum system, generally by those who do not discriminate between the various means by which it can be carried out. On what may be termed the 'high pressure method,' a temperature of 130° F., as the air enters the apartments, is not uncommon; but in Belfast the temperature of the air in no portion of the building exceeds 62° or 63°. Before designing the machinery for Belfast, inquiry was made as to the power which would be required for working on the high pressure method, and it was found that 100 horse-power would be necessary; instead of which, it is successfully accomplished with an ascertained expenditure of 5¼ horse-power, on what may be termed the 'low pressure method.'"

Illustrations.

PORTRAIT OF M. CHOISY.

WE have pleasure in presenting our readers with a portrait of M. Auguste Choisy, the distinguished French *savant* to whom the Gold Medal of the Institute was presented on Monday last, as fully described on another page.

We have to thank M. Choisy for his courtesy in sending us a photograph for the purpose.

THE LIVERPOOL AND LONDON AND GLOBE INSURANCE CO., CORNHILL.

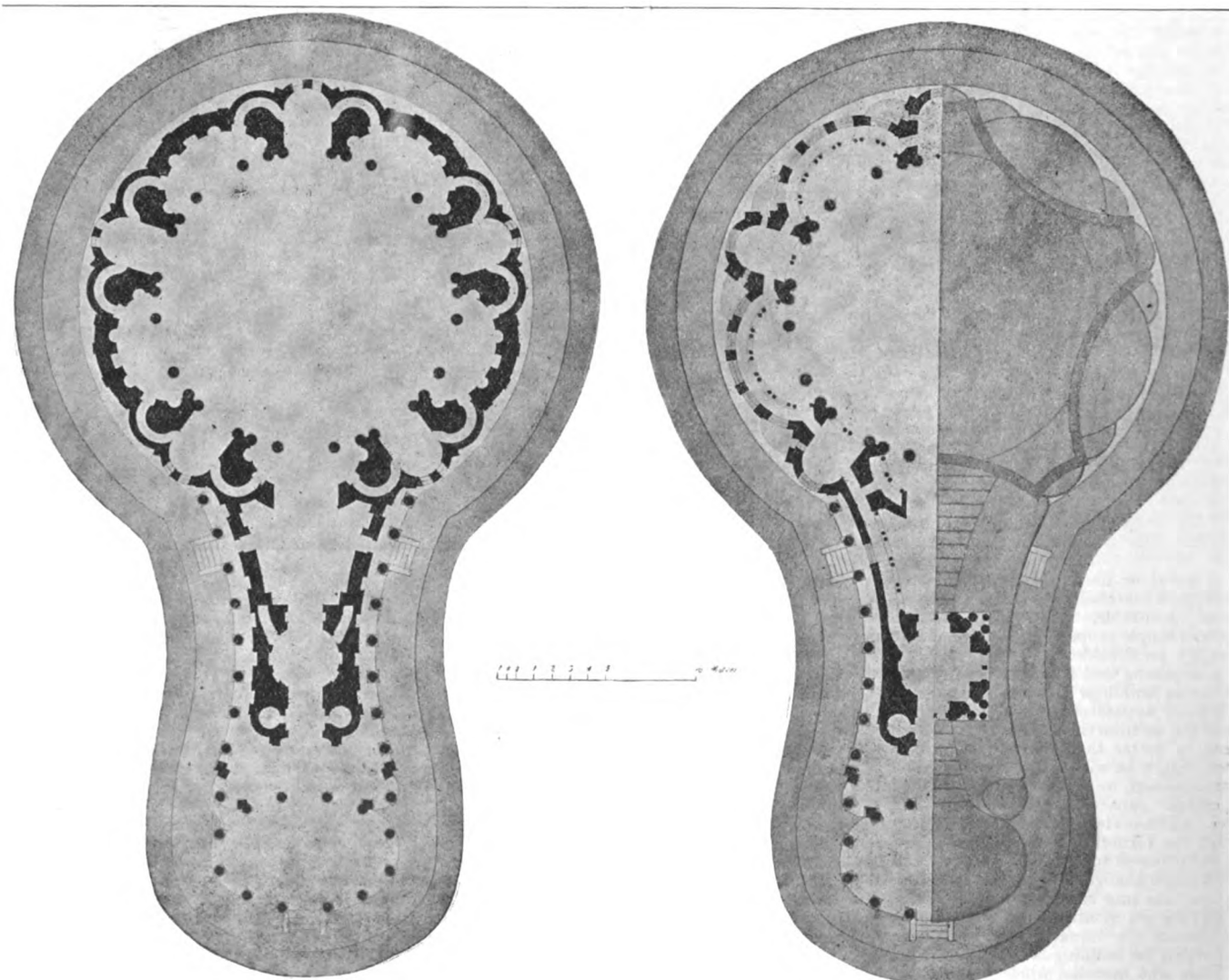
THE site of this building is no doubt one of exceptional importance, but it is none the less one which, on account of its outline, it is exceptionally difficult to treat. This difficulty has been to a considerable extent modified by an alteration suggested to and accepted by the City authorities, by virtue of which the angles at Cornhill and Lombard-street are now identical, instead of being as formerly the one acute and the other obtuse, thus

The plan (see p. 689) has been controlled by and adapted to the peculiarities of the site. The circular front between Cornhill and Lombard-street, which has been retained, has to a large extent dominated the design both externally and internally. On the ground floor, for instance, the general office of the company is planned as a circle, with a gallery on the Mezzanine floor supported by the columns, while externally the circular treatment is continued upwards, and is terminated by a dome forming a prominent central feature opposite to the axis line of Cheapside. The building is executed externally in Portland stone, and the whole of the office of the company internally, as well as the entrance corridor, is finished in marble, including columns, wall linings, cornices, balustrades, and floors, the ceilings of the office being in faience. The general contractors are Messrs. Colls and Sons.

J. MACVICAR ANDERSON.

THE ANCIENT CHURCH OF ASFELD, ARDENNES (FRANCE).

THESE illustrations, with the plans, are from a set of drawings exhibited in the architectural room at the Paris Salon, 1903, by a well-known French architect, M. Allard. We at first supposed that this was a modern church built from his designs, but on inquiry found that the drawings were only illustrative, and that the church was an old one; but we were not able to get any precise information either as to its date or whether there was any record of the



Plan at ground level.

Plans of upper stage and roof.

Ancient Church of Asfeld, Ardennes, France. Plans.

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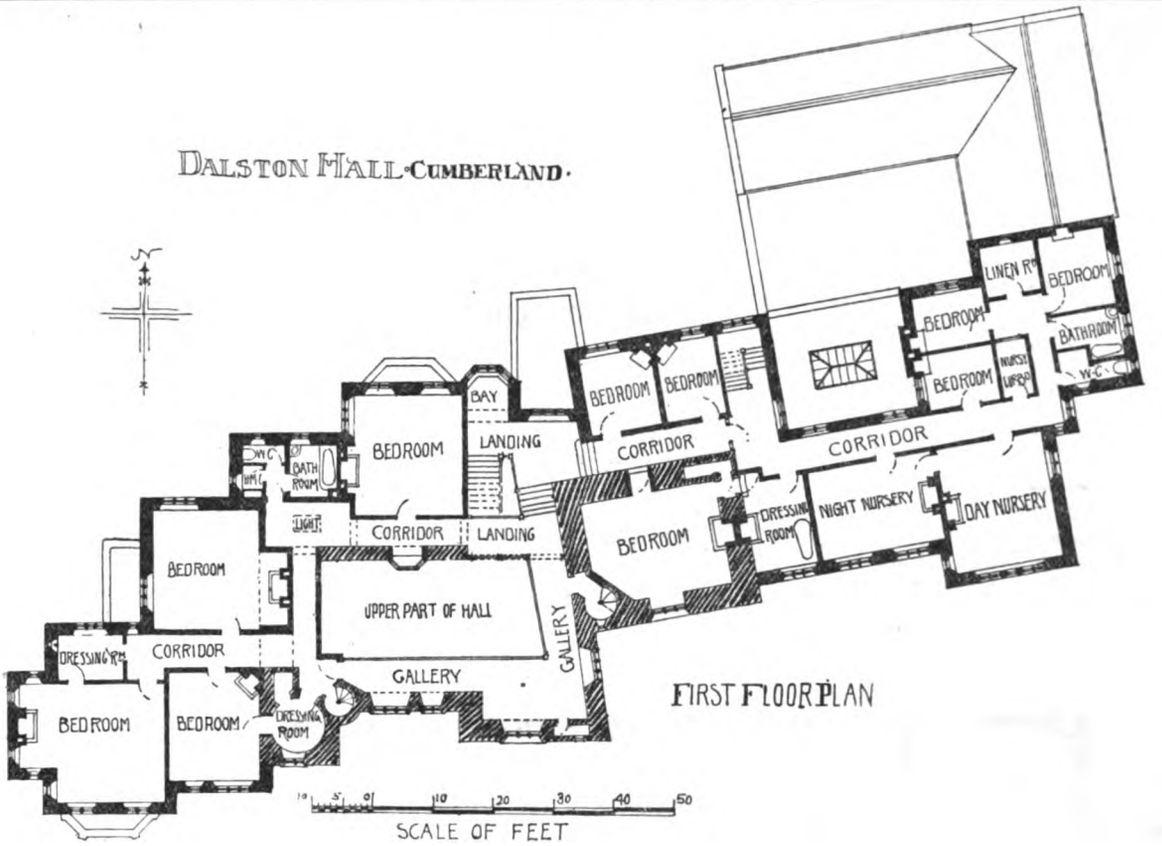

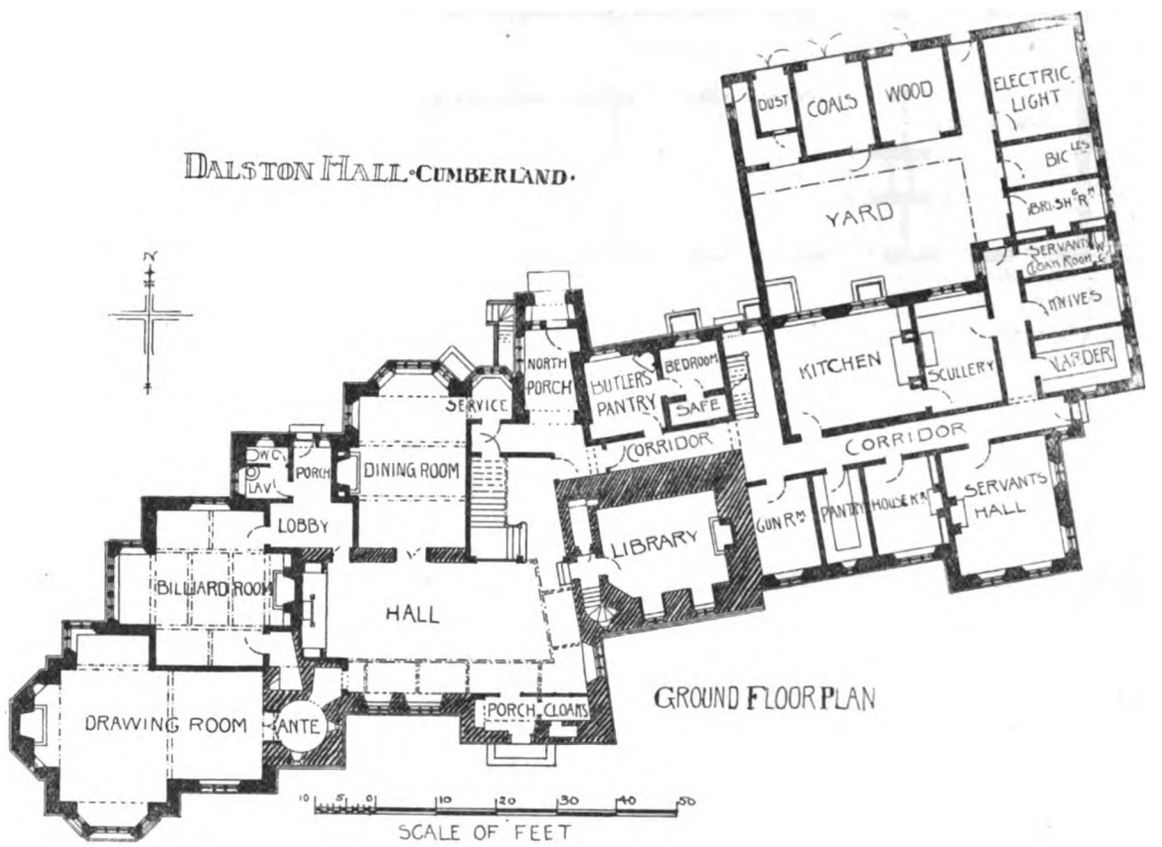

name of its architect. It appears, however, to be a building of the Renaissance period.

From some crudities in the design and detail, it would seem not improbable that it was by a local architect who was not in touch with the best architectural learning of the period. But we think all our readers will agree that it is a most remarkable and original architectural conception, in general plan and design. We never came across anything like it before, and on seeing M. Allard's drawings at the Salon, we felt a wish to bring so interesting a design to the knowledge of our readers, and M. Allard kindly consented that his drawings should be photographed for reproduction in this journal.

DALSTON HALL, CUMBERLAND.

THE Dalston Hall Estate became the possession of Mr. E. W. Stead in the latter part of 1897, and early in the following year extensive additions were commenced to the old building, together with new stables, lodges, farmhouse, etc.

The tower is one of the numerous examples of Border Pele towers erected during the reign of Henry IV., consisting of a vaulted chamber on the ground floor and a room over in each story, with a fighting deck and watch-tower on the top. A century or so later buildings were erected westward, of a somewhat pretentious nature, for the family of the Dalstons, who were now of some importance, and eastward for their retainers and for stores. But the fortunes of the Hall shared the misfortunes of the family, and for several generations previous to Mr. Stead's purchase it was used as a farmhouse and surrounded by farm-buildings, all dilapidated and going to ruin.

In making alterations the old walls, as indicated on the plans by hatched lines, were retained as far as possible, and the new work was added in a style in harmony with the old. The north porch was built recently, together with a new drive, thus somewhat altering the *motif* of the original planning.

The names of the various contractors were as follows:—Foundations, Messrs. Beaty, Carlisle; builders, Messrs. Rathbone, Atherton, Lancs; joiner, Mr. G. Black; fireproof floors, the Carlisle Fireproof Floor Co.; plasterers, Messrs. Ormerod; plumbers, Messrs. Thomson; slater, Mr. J. Kellet; painter, Mr. W. Ballantyne, all of Carlisle; heating, Mr. J. Grundy, London; electric lighting, Messrs. Verity, London; wrought-iron casements, Messrs. Cuttal, Braintree; ranges and grates, Messrs. Longden, Sheffield. J. W. BENWELL.

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ELKS CLUB, COLORADO SPRINGS, COLORADO, U.S.A.

THIS club is the social feature of the Order of Elks, and occupies the two lower floors of the building, the third story being reserved for lodge room and accommodation in connexion with it.

The building is of light-coloured brick with stone trimmings, and the roof is of red tiles. The upper story of the main elevation is formed into a frieze and enriched with four shields on which are carved the emblems of the order—Charity, Justice, Brotherly Love, and Fidelity. The interior woodwork is of birch throughout and stained. The building cost $46,000 (8,200*l.*), and the contractor was Mr. John Hill, of Colorado Springs. The sketches for plans and design of the building and supervision of details were by Mr. T. MacLaren; Messrs. Douglas and Hetherington made the working plans, and Mr. L. A. Pease superintended the construction.

COMPETITIONS.

KINGSTON-ON-THAMES ELEMENTARY SCHOOL.—The assessor, Mr. T. J. Bailey, has selected the design sent by Mr. F. W. Roper, of 9, Adam-street, Adelphi. There were ten competitors in all. The assessor spoke highly of the general merit of the designs and plans.

BOOKS RECEIVED.

TRANSACTIONS OF THE SOCIETY OF ENGINEERS FOR 1903. Edited by Perry F. Nursey. (E. and F. N. Spon.)

MOLESWORTH'S POCKET-BOOK OF ENGINEERING FORMULÆ. Twenty-fifth edition. (E. and F. N. Spon. 6s.)

THE LAW AND PRACTICE RELATING TO PRIVATE STREET WORKS. Fourth edition. (E. and F. N. Spon. 12s. 6d.)

Correspondence.

"UNLAWFULLY COMMENCING" A NEW STREET.

SIR,—We are summoned by the London County Council to appear at the South London Police Court at 2 p.m. on the 30th inst.

1. For unlawfully commencing to alter and adapt a street or way without first having obtained the sanction of the London County Council, under Building Act, 1894, sections 10 and 200, 1 (a).

2. Unlawfully commencing to form and lay out a street without having first obtained the sanction of the London County Council, under Building Act, 1894, sections 7 and 200 (1) (a).

We shall be glad if any of your readers, who have been similarly worried, will kindly communicate with us, because we intend to defend the action of the Council.

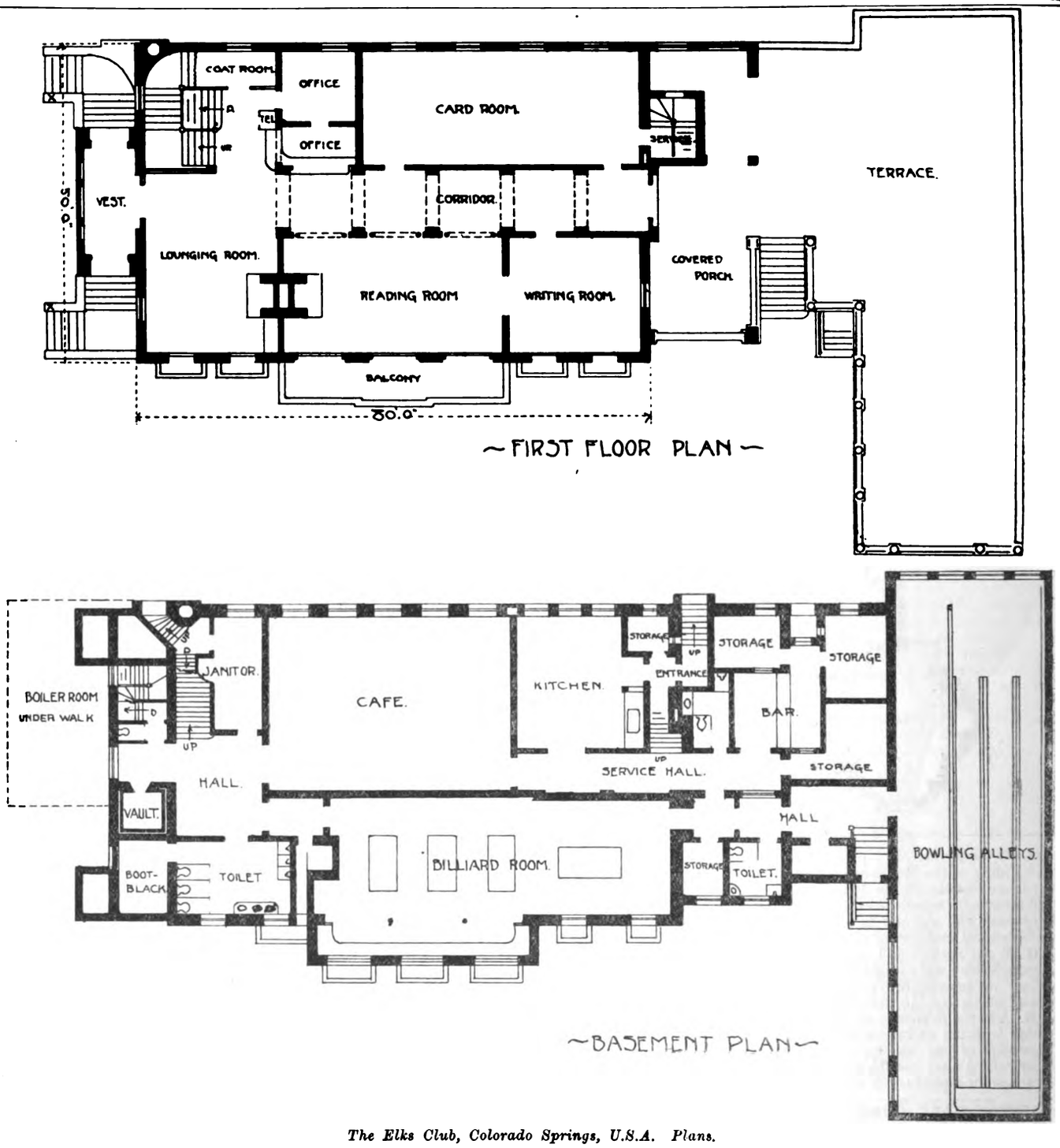
During the whole of the time we have been in Fulham (now nearly four years) they have been a constant worry to us. The District Surveyor has repeatedly complained about most absurd things. The roadway here is our private freehold property, with a gate, which is closed every night, and only opened by our caretaker during the day.

A few other persons have bought freehold land abutting on the same roadway, with a right of way over the roadway, and we are now building a warehouse at the back of the house, which fronts on the public roadway of Parson's-green, but such warehouse abuts upon our private roadway.

To us, it appears most unfair that the London County Council has the power to prove itself a source of expense and worry to ratepayers without any just cause.

J. H. HEATHMAN AND CO.

RESTORATION OF THE PARISH CHURCH, WALBERTON, SUSSEX.—The reopening of the Walberton parish church, after having been restored, took place recently. The restoration has been carried out by Messrs. Bell and Son, of Saffron Walden, under the direction of Mr. Richard Creed, architect, of London.



The Elks Club, Colorado Springs, U.S.A. Plans.

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The Student's Column.

ARCHES.—XXV.

WE have already seen that the ribs of the centring are supported on horizontal timbers parallel to the soffit of the arch at, or a little above, the springing, or to the inner surface of the piers or abutments, and that intermediate supports are also employed as may be required. To facilitate the removal of the ribs and centring generally, hard wood wedges are inserted beneath these timbers and the supporting framework so that they can be driven out at the proper time. The wedges are known as *striking wedges*, and the operation of removing them is termed *striking the centring*.

Ordinary striking wedges are made in pairs varying from 1 ft. to 2 ft. long, by 6 in. wide, and having a taper of from 1 to 5 to 1 to 10. As it is necessary to remove the centres very gradually, especially when the arch is of large span, the taper of the wedges must be small, and should be in an inverse ratio to the span of the arch.

For the purpose of insuring uniformity in the lowering of the centres, the whole series of wedges must be driven out with much care. The usual practice is to scribe a mark on each pair of wedges, and all of them are then driven out for a specified distance. Another mark is then made on the wedges, and they are again driven out for the defined distance. By further repetition of these operations, the whole of the wedges are finally removed by perfectly regular and equal stages.

Compound wedges are frequently employed instead of separate pairs of folding wedges. Fig. 115 represents a pair of striking plates A and B, with a compound wedge C between them. The lower striking plate B is a stout beam, suitably notched on the upper side, and rests upon the supports provided for the centring; the upper striking plate A is similarly notched on the under side, and is immediately below the centring, the ribs of which rest directly upon it. The wedge C separates the striking plates, being held in place by tapered keys, or folding wedges, *d*, *d*, driven behind its shoulders. When the centring is to be struck these keys or wedges are driven out, and, as the compound wedge C is slowly driven back, the upper striking plate is gradually lowered.

The wedge C usually extends along the full width of the arch, and, through the striking plate A, supports one end of all the ribs. It is usually from 10 in. to 12 in. square and the notched sections are from 4 ft. to 6 ft. long. The surfaces of the wedges should always be lubricated when the centring is erected, so as to facilitate the subsequent operation of striking. In arches of from 70 ft. to 100 ft. span each rib is generally supported by compound wedges placed transversely to the line of the posts or piles supporting the entire centring.

Fig. 112 shows one of the pairs of striking plates used in the centring of London Bridge.

In the centring introduced by Sir Charles Hartley (see Fig. 110), each lagging could be struck separately by lowering the supporting wedges or screws. Striking plates for the support of the entire arch were thus rendered unnecessary.

An ingenious method of striking arch centring by means of sand was first devised by M. Baudemoulin, a French engineer. The centring was supported on strong bags filled with sand, and to lower the centring the sand was allowed to escape through openings cut in the bags. This method was afterwards improved by M. de Sazilly and applied at the Pont d'Austerlitz in Paris by M. Bouziat. The apparatus is thus described * :—"The lower striking-plate consists of a timber platform, on which stand a number of vertical plate-iron cylinders, of nearly 1 ft. in diameter and 1 ft. in height. The lower end of each cylinder fits on a circular wooden disc about ⅜ in. thick. About 1¼ in. above the base of each cylinder are four round holes, of about ¾ in. in diameter, stopped with corks. Each cylinder is filled about two-thirds or three-quarters full of clean, dry sand; and upon the sand rests the lower end of a cylindrical wooden plunger loosely fitting the cylinder, which plunger is, in fact, the lower end of one of the upright posts of the framework of the centre. The joint between the plunger and the cylinder is stopped with plaster, to protect the sand from moisture. When the centres are to be struck, the plugs are taken out of the cylinders, and the sand, running out of the holes, allows the centres to sink slowly and steadily. The sand, if necessary, may be loosened with a hook, to make it run freely; and it must be cleared away from the holes as it runs out."

* Exposition Universelle, 1862.—Notices sur les Modeles, Cartes, et Dessins Relatifs aux Travaux Publics.

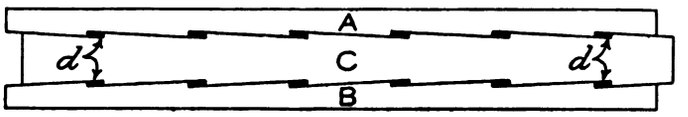

FIG. 115

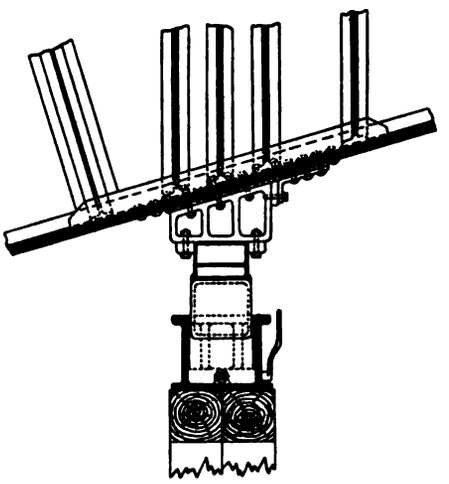

FIG 116

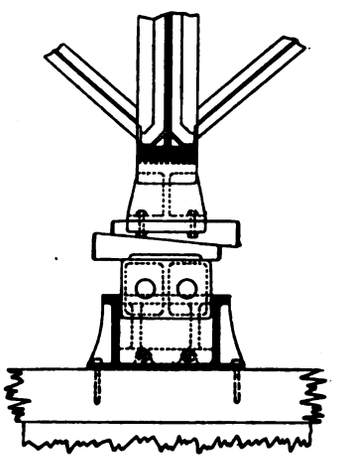

FIG 117

The same device was also applied in striking the centres of the Pont de l'Alma in Paris.

In the case of the King Edward VII. bridge, at Kew, the steel ribs, one of which is represented in Fig. 113, were carried on sand boxes placed below the points A and B. The details of construction of the sand boxes are shown in Figs. 116 and 117. The sand boxes consisted of rectangular cast-iron chambers, measuring 2 ft. by 1 ft. 4½ in. internal dimensions, by 1 ft. 6 in. deep overall, and were secured to the timber framework below by 1¼ in. coach screws. Each box was partly filled with clean, sharp sand, on which was set the cast-iron plunger, as shown in the drawings, leaving space for the insertion of a pair of wedges, each measuring 2 ft. 6 in. long, with a taper of 2½ in. Screwed plugs were fitted into the lower part of the box for running off the sand, and in Fig. 116 one of these is shown with a spanner in position. The masonry arches of the bridge were completed in October, 1902, but the striking of the ribs was not undertaken until the following year. The sand boxes were found to answer their purpose admirably, and the ribs were regularly lowered at the rate of 1 in. in forty minutes. When the centring was entirely clear of the arches, the lagging timbers were removed, and the ribs were taken away in sections after the joints had been cut.

Although the use of sand boxes in connexion with bridge construction is comparatively recent, the same principle was undoubtedly employed thousands of years ago for lowering heavy blocks of stone into position.

It sometimes happens that the sand refuses to run from one or more of the boxes in consequence of frost or from other causes, and, unless detected in time, such an occurrence may cause injurious strain in an arch and even threaten its failure. Hence some engineers prefer to effect the striking of the centring by means of jacks, the action of which can be positively controlled throughout the operation.

Some difference of opinion exists as to the period that should elapse between the completion of an arch and the striking of the centres. A not infrequent practice in tunnel, sewer, and culvert construction is to remove the centring directly after the arch has been turned and about half the spandrel filling has been put in position. Many bridge engineers permit the centring to be thus taken away, without paying much attention to the condition of the mortar. A far wiser course is to allow adequate time for the mortar to harden, especially when lime mortar is used, although it is a good plan to lower the centring slightly as soon as the keystone has been inserted, so that all the joints may be subjected to a certain amount of pressure.

The precise length of time that ought to be allowed to elapse before the final striking of the centring must necessarily depend upon the kind and quantity of mortar employed in the joints, and sometimes upon atmospheric conditions.

Table XII. shows approximately the effect of time on the setting of various kinds of mortar. The data from which this table has been prepared include the results of a large number of experiments on mortar freely exposed to the air, but it should be remarked that the process of setting is obviously retarded in the case of mortar in masonry joints, where air is almost entirely excluded.

In brick arches, it must be remembered that a very considerable proportion of the arch ring consists of mortar, owing to the large number of radial and concentric joints. Hence the removal of the centring at too early a period tends to produce a very perceptible deformation, and in some cases may seriously threaten the safety of the structure.

TABLE XII.—EFFECT OF TIME ON THE SETTING OF MORTAR, IN TERMS OF TENSILE STRENGTH.

Description of Mortar.		One Week	One Month	Three Months	Six Months
		lb. per sq. in.	lb. per sq. in.	lb. per sq. in.	lb. per sq. in.
Lime	1 : 3	9	18	33	40
Portland Cement	1 : 10	25	41	65	75
,,	1 : 8	37	65	112	136
,,	1 : 6	93	125	180	216
,,	1 : 3	135	170	255	305
,,	1 : 2	195	260	350	405
,,	1 : 1	277	360	430	470
,,	1 : 0	460	550	625	650

When air is excluded from lime mortar by surrounding masonry, it is safe to say that setting of the interior portions cannot be completely effected for years. Indeed, lime mortar taken from the walls of ancient buildings has been found, with the exception of a thin outer crust, practically in the same condition as if it had been newly mixed. These considerations point clearly to the advisability of using cement mortar for arch construction.

We have alluded in a previous article to the sinking that always takes place owing to the depression of the centring when still in position. The extent to which an arch will sink after the removal of the centring depends upon the time allowed for setting of the mortar and upon the quality of the workmanship. In several large French arches the depression after striking was very great, evidently owing to bad masonry work.

As an example, we may quote the bridge built by Perronet at Neuilly, in France, the centring sunk 13 in. while still in position, and after its removal a further sinking of 9½ in. took place. The crown of the centring had a radius of 150 ft., but the sinking of the arch was such that for a length of 60 ft. the arch assumed the form of an arc with a radius of

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244 ft. In spite of this important deformation, however, the arch still stands, after having been in existence for about 130 years.

It is recorded that upon the removal of the centring from Waterloo Bridge none of the arches sank more than 1½ in., and, as mentioned in Article XXI., the maximum depression of the great arch at Plauen was less than 1 in. These two cases show the advantage to be derived from the scientific design and construction of arch centring.

ARCHES.—XXVI.

IN this, the concluding article of the present series, we give some notes relative to the theory and construction of domed structures. Apart from such structures as the Treasury of Atreus (Fig. 7, p. 18 *ante*), which were not correctly representative of the principles of the arch, many fine domes were erected in ancient times. Chief among these may be mentioned the domes of the Pantheon, Rome; Santa Sophia, Constantinople; Santa Maria del Fiore, Florence; and St. Peter's, Rome. These still remain as a testimony to the courage and skill of their designers, but, with the exception of the Pantheon, the construction of these monumental works is incorrect. Fissures and cracks have appeared from time to time in the three last mentioned, and reinforcement has been necessary to prevent failure.

In spite of the fact that correct principles were demonstrated in the early part of the last century, some designers continue to adopt methods of construction that are inaccurate. Our object in this article is to point out methods that avoid the defects not infrequently evidenced in the past, and to induce our readers to make further study of a most interesting branch of architectural design, which has not been practised so generally as might be desired, owing to lack of confidence in the stability of domed structures of any great size or distinct boldness. An excellent discussion of the whole subject is to be found in a recent communication to the American Society of Civil Engineers by Mr. E. Schmidt, from whose paper the following formulæ and accompanying diagrams have been adapted.

(1). We will first consider the case of a truncated dome, to determine the stress on the crown ring, which is always a compressive stress.

Let S = the tangential peripheral stress due to the unit pressure on the ring.
p = the unit pressure, and
R = the radius of curvature.

Then:—

$$S = p\,R \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

The stress per unit length of meridian and per unit length of circumference is found by drawing the triangle of forces, with w = the weight per square unit of spherical surface, as a known quantity, as in Fig. 118, and by comparing this with the similar triangle R r_x h_x, where r_x is the length of the parallel.

Whence:—

$$w : p_x :: r_x : h_x, \text{ or } p_x\,r_x = w\,h_x,$$

and the ring stress in the crown may be written:—

$$S = w\,h_x \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

where h_x is the height of the crown ring above the equatorial base of the dome.

(2). Considering now a closed dome with the base at the height h_y above the imaginary equatorial base, as in Fig. 119, determine the tangential meridional thrust, which always results in compressive stress, and determine, also, the circumferential ring stress, which at the base is always tensile.

Two principal stresses exist at the base of every dome—the tangential meridional thrust T, and the horizontal ring stress B in the bed-joint. These two stresses must balance each other, and they are caused by the weight W of the dome. The value of W is represented by the equation:—

$$W = 2\,R\,\pi\,a\,w \quad . \quad . \quad . \quad . \quad (3)$$

where R = radius of curvature.
a = unit of length of circumferences (measured approximately by its chord).
w = the weight per square unit of spherical surface.

Taking any given value for W, the triangle of forces W T θ is drawn, as in Fig. 119, and this, compared with the similar triangle r_y h_y R, leads to the proportion W : T : : r_y : R.

Whence:—

$$T = W\frac{R}{r_y} \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

or, substituting the equivalent of W as in equation (3):—

$$T = \frac{R}{r_y}\,2\,R\,\pi\,a\,w \quad . \quad . \quad . \quad (5)$$

Taking the unit value of B the horizontal ring stress, and denoting it by b, the conditions of equilibrium round the entire base of the dome demand the condition:—

$$T = 2\,r_y\,\pi\,b \quad . \quad . \quad . \quad . \quad . \quad (6)$$

and, considering the value of T as in equation (5), we have:—

$$b = \frac{R}{r_y^2}\,a\,w \quad . \quad . \quad . \quad . \quad . \quad (7)$$

Now, taking the unit value of T and denoting it by t, we find:—

$$t = \frac{T}{2\,r_y\,\pi}$$

or, considering the value of T, as in equation (5):—

$$t = \frac{R^2}{r_y^2}\,a\,w \quad . \quad . \quad . \quad . \quad . \quad (8)$$

Thus, the unit ring stress b, at any point round the circumference of the base is of the same intensity as the unit tangential meridional thrust t, but these stresses are always opposite in sign.

Making the following substitutions: $a = R - h$, and $r_y^2 = R^2 - h_y^2$, and using the + sign to indicate tension and the − sign compression, we have:—

$$t = +\frac{R^2}{R + h_y}\,w, \text{ and } b = -\frac{R^2}{R + h_y}\,w \quad . \quad (9)$$

(3). By combining the conditions assumed in cases (1) and (2) the stresses at any point in a complete hemispherical dome can be determined.

Let it be assumed, as in Fig. 120, that the closed dome represented in Fig. 119 is placed above the open dome in Fig. 118, so as to form a complete hemispherical dome. Then the stresses at any parallel having the radius r and the height h above the equatorial base will be:—

$$t = +\frac{R^2}{R + h}\,w, \text{ and } b = -\frac{R^2}{R + h}\,w + w\,h \quad (10)$$

The above expression for the base ring stress is seen to include a negative term due to the upper part of the dome and a positive term due to the lower part. It should be observed that special values of t and b occur at the crown, where h = R, and the value of $t = +\,w\,\frac{R}{2}\,w$, and the value of $b = +\frac{R}{2}\,w$, both stresses being compressive.

Again, at the equatorial base, where $h = 0$, the value of t = + R w, and of b = −R w.

Hence, as b passes from compression at the crown to tension at the base, it is obvious that there must be some point, analogous to the point of contrary flexure in an *encastré* beam, where the value of $b = 0$. The height at which $b = 0$ is h = 0·618 R, and the corresponding angle from the vertex is θ = 51° 49′.

The point at which b = 0 is termed the joint of rupture.

From the foregoing, it is evident that the parallel at a height of 0·618 R above the equatorial base divides the surface of a full dome into two parts—the upper part being in compression in every direction, while the lower part is in compression and in tension. The meridional stress is compressive, and the ring stress tensile, commencing with zero value at the joint of rupture and reaching a maximum value at the base where b = − R w.

We are now able to realise very clearly that, as tensile stress is to be found in all courses below the joint of rupture, brick masonry is not altogether suitable for the construction of complete semi-hemispherical domes, owing to its inability to resist tension. But brick may be used with perfect safety in domes extending from the crown down to an angle of 51° 49′, providing it is confined at the base, so delimited, by a ring of material adequate to resist the tensile stress involved.

Domes of stone masonry are governed by the same conditions, but they may be built to extend below the joint of rupture, providing the method of construction is such as to provide adequate resistance to tensile stress.

(4). By a further combination of the conditions assumed in cases (1) and (2) the stresses in the crown and base rings for any truncated dome, such as that in Fig. 121, can be ascertained as

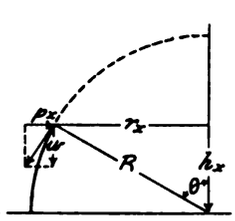
FIG. 118

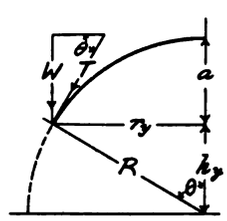
FIG. 119

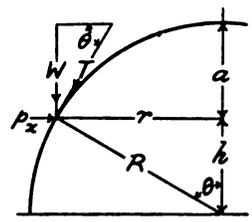
FIG. 120

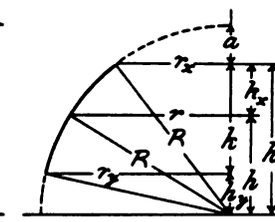
FIG. 121

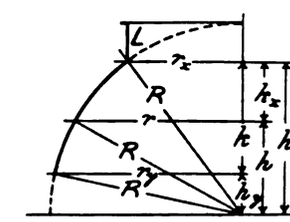
FIG. 122

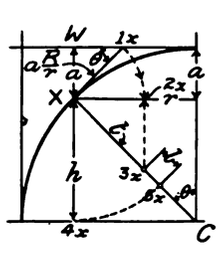
FIG. 123

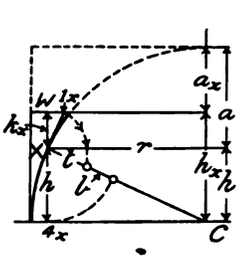
FIG. 124

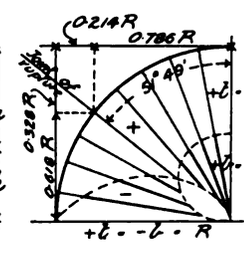
FIG. 125

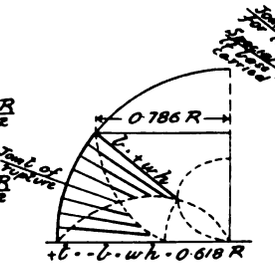
FIG. 126

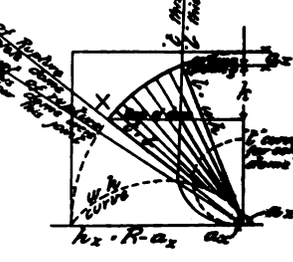
FIG. 127

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well as those at any intermediate point between the two parallels.

In Fig. 121, let k be the vertical distance between the base and crown rings, and k_x the vertical height of the crown ring above any parallel r. Then:—

$$t = + \frac{R^2}{r^2} k_x w$$

$$b = - \frac{R^2}{r^2} k_x w + w h \quad . \quad . \quad (11)$$

The last term in the equation for b represents the compressive ring stress for that part of the dome below the parallel considered. Hence when h reaches the lower limit h_y, the value of $w = 0$ in that term.

Again, at the crown ring, $t_x = 0$ and $b_x = w h_x$, while at the base $t_y = + \frac{R^2}{r_y^2} k w$ and $b = - \frac{R^2}{r_y^2} k w$.

Special joints of rupture occur in the case of truncated domes where the bases of such domes are below the joint of rupture already defined. Reference to this point will be made later.

(5). If to an open dome, such as that represented in Fig. 121, we add a further load L by the imposition of a lantern, or other architectural feature, upon the crown ring, as in Fig. 122, the formulæ already stated require modification.

As an additional load of this character is distributed over ever-increasing circles during transmission from the crown ring down to the base, the unit load at any parallel r will be:—

$$l = \frac{L}{2 r_x \pi}$$

and the stress at any parallel r, will be:—

$$t = + l \frac{R r_x}{r^2} + \frac{R^2}{r^2} k_x w \quad . \quad . \quad . \quad . \quad (12)$$

$$b = \pm l \frac{R r_x}{r^2} - \frac{R^2}{r^2} k_x w + w_y h \quad . \quad . \quad (13)$$

The following are special values of t and b:—

At the crown when $r = r_x$; $k_x = 0$; and $h = h_x$:—

$$t = + l \frac{R}{r_x}$$

$$b_x = + (w + l) h_x$$

$$b = + l \frac{R}{r_x} + w h_x$$

At the base, when $r = r_y$; $k_x = k$; $w_y = 0$; for $h = h_y$. Hence:—

$$t = + l \frac{R r_x}{r_y^2} + \frac{R^2}{r_y^2} k w$$

$$b = - l \frac{R r_x}{r_y^2} + \frac{R^2}{r_y^2} k w$$

Fig. 123 is a diagram showing a graphical method of determining the magnitude of the principal stresses for any point X of a full dome.

Those stresses for a spherical dome are:—

$$t = + \frac{R^2}{r^2} a w \text{ and } b = - \frac{R^2}{r^2} a w + w h$$

and can readily be represented graphically. The starting point is the quantity $W = R a w$, where W = the weight of a zone sector having the height a and a base equal to a unit of length at the equator.

In Fig. 123 W is represented for $w = 1$ by the line W X = a. The mode of constructing the diagram is as follows:—

For any point X and the radial C X draw W 4_x, and draw the tangent X 1_x, perpendicular to C X. With X as the centre, describe the arc $1_x 2_x$, and draw the vertical $2_x 3_x$. With the centre X and radius X $4_x = h$, describe the arc $4_x 5_x$, meeting the radial C X. Then X 3_x represents t, and $3_x 5_x$ represents b, as noted on the diagram.

By a similar method, the diagram Fig. 124, is constructed for a truncated dome.

Repeating the construction for a number of radial ordinates, we get the diagrams Fig. 125, 126, 127, where the values of t are represented by thin lines except at the base and the values of b by thick lines.

It should be noted that above the joint of rupture, b is compressive, and below it tensile, providing the base is at a height less than 0·618 R above the equatorial base. By comparing Figs. 125 and 127, it will be seen that in the closed dome the values of b are much less than in the open dome, and that the values of t are correspondingly greater.

In order that the masonry of a dome may be able to withstand tensile stress it is desirable that the coursing should be designed so that no reliance is placed on frictional resistance or the adhesive strength of the mortar. To comply with this condition, the blocks below the joint of rupture should be so shaped that each circumferential unit length of bed may be able to withstand a thrust equal to t, and that any cross section may be able to withstand tensile stress equal to b.

These conditions could probably be best obtained by designing the masonry in shouldered and tenoned courses. The depth of the tenons could be decreased with the diminution of the stress b from the base up to the joint of rupture. Below this joint the stone should possess high tensile strength, and above it the chief qualification of the stone should be high compressive strength.

Table XIII. is given for general guidance in the practical design of domed structures, but the designer ought always to work upon definite information as to the precise physical qualities of the materials to be used in the construction of any proposed dome.

TABLE XIII.—AVERAGE WEIGHT AND STRENGTH OF MATERIALS SUITABLE FOR THE CONSTRUCTION OF MASONRY DOMES, AND RATIO OF DIAMETER TO THICKNESS.

Material.	Weight.	Safe working stress in lb. per sq. ft.		Safe diameter of dome (thickness = 1 ft.).
		Compression.	Tension.	
Granite	170	215,000	27,000	316
Limestone	150	130,000	16,000	212
Marble	165	144,000	18,000	218
Sandstone	140	170,000	20,000	284
Brick in lime	110	18,000	900	16
Brick in cement	120	36,000	5,400	90
Concrete	150	36,000	7,000	94

From what was said in the earlier part of this article, it is clear that if the springing joint of a dome is placed at an angular distance of not more than 51° 49′ from the crown, or pole, as in Fig. 130, no tensile stress will be evidenced in any direction, except in the bed joint of the lowest course. Therefore, in such a case the only auxiliary reinforcement required to insure stability will be a course of masonry bonded so as to resist the outward pressure that tends to burst the dome. A strong band of steel or concrete-steel would, of course, answer this purpose equally well.

In a masonry dome where a tension zone exists, the whole of this zone may be reinforced by a sheathing of steel plate, able to resist the tensile stresses involved as a substitute for courses of shouldered and tenoned masonry. But if the dome is intended to form a prominent feature in a building of monumental character, the use of steel reinforcement in this manner would be quite out of place, and the entire zone, from the joint of rupture down to the base, should be of masonry, specially designed to withstand the calculated ring stresses.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held on Thursday last week, at the City Hall, Charing Cross-road.

The General Purposes Committee reported the receipt of a communication from the City Corporation enclosing copies of resolutions passed at the Conference of delegates from the Local Authorities, within the London Telephone area, with regard to the proposed purchase by the Government of the National Telephone Company's undertakings. The communication was acknowledged.

A communication was received from the Local Government Board approving the proposal of the City Council to appoint two temporary women sanitary inspectors.

Public Health (London) Act, 1891.—The Committee reported the receipt of a letter from the London County Council in regard to the administration of this Act, and suggesting that representatives of the Borough Councils should meet to discuss the matter at a conference which they had convened for July 17 next, and asking the City Council to appoint representatives. It was agreed to inform the London County Council that, in the opinion of the City Council, the matter was one for the consideration of the Metropolitan Borough Councils, and that any such conference should be of an inter-borough nature only. It was also agreed to address a communication to the Corporation of the City of London, and the various Metropolitan Borough Councils, stating the view of the City Council on the matter.

Draining and Paving of Stables.—It was agreed to inform the London County Council, in answer to an inquiry from that body, that the City Council had experienced but little difficulty in enforcing the by-law as to the draining and paving of stables.

Holborn to Strand Improvement.—On the recommendation of the Works Committee, the plans submitted by the Engineer to the London County Council with regard to the paving of Aldwych, Kingsway, and Catherine-street, were approved, and it was agreed to ask the London County Council to provide sunk orderly bins in the footways of Aldwych, Kingsway, and adjacent streets, similar to those placed on Waterloo Bridge.

Golden-square Garden.—It was agreed to take over and maintain this garden in the event of its being thrown open to the public.

Advertisement Hoardings.—The Committee reported having considered a letter from the Royal Institute of British Architects with reference to the abuse of buildings by advertisement hoardings, quoting, as an instance, the advertisements that cover the façade of the building adjoining Bow Church, in Cheapside, where the windows are partially blocked by advertisement boards. The letter referred to the illogical condition of municipal regulations which allowed the erection of those structures in front of window spaces. It was agreed to inform the R.I.B.A. that the Council were in accord with its views.

OBITUARY.

MR. LAW.—We have to announce the death, a few days since, at Northampton, aged 64 years, of Mr. Edmund Law, until recently County Surveyor of Northamptonshire, and Surveyor to the local Church Charity Trustees. Mr. Law was the son of the late E. F. Law, to whom he was articled, and whom he succeeded as County Surveyor, an office he resigned through ill health three years ago. He was elected a Fellow of the Royal Institute of British Architects in 1881, and was a Fellow of the Surveyors' Institution. In October, 1895, he took into partnership his chief assistant, Mr. Sidney F. Harris, under the style of "Law and Harris, architects and surveyors," of Lloyd's Bank-buildings, St. Giles's-square, Northampton; his son, Mr. H. H. Law, subsequently became a member of the firm. Mr. Law was the architect of Nos. 47-9, Gold-street; Goodyear-chambers, at the corner of Lower Mounts, Abington-street; and the new County Council Chamber (1890) at the rear of the (old) County Hall, in George-row, in Northampton. He carried out the restoration of the chancel of the parish church of St. Mary, at Dallington (the general restoration having been begun by him and his father in 1880); he made the designs for the reredos, in Caen stone and alabaster, of St. Giles Church, and restored the parish church of All Saints, Northampton. Messrs. Law and Harris gained the first premium with their plans and designs for the Barry-road Board Schools, Northampton, to receive 1,370 children, with swimming bath and laundry, and erected under Mr. Sidney Harris's superintendence. In 1883 Mr. Law made the designs for the stone reredos in the church at Dallington, having twelve niches for statues of the Apostles, nine of which have since been placed in position.

MR. COOPER.—We have also to announce the death, in his forty-sixth year, of Mr. William Cooper, of No. 21, Havelock-road, Hastings, and of Seaford, who carried on an extensive practice as an architect and surveyor in Sussex and was employed in laying out several properties for building purposes in Hastings, St. Leonards, Bexhill, and other places in that part of the county. Mr. Cooper rejoined the Architectural Association in 1884, and three years ago took Mr. H. W. Coussens into partnership, under the style of Messrs. Cooper and Coussens. Mr. Cooper prepared the plans and designs for the extensive alteration and enlargement of Crouch House, at Seaford, for Mr. J. F.

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Plaister: for a residence at Seaford, for Dr. W. P. Morgan; houses and shops at Silverhill; and—we understand—the Hastings and St. Leonard's Ladies' College; he and his partner were architects of houses in Downsroad, and the residential flats in Mount Pleasant-road, Hastings.

GENERAL BUILDING NEWS.

CHURCH, PORT SUNLIGHT.—On the 8th inst. Mrs. W. H. Lever formally opened Christ Church, Port Sunlight, which has been built at a cost, including fittings and equipment, of 28,000*l.*, and presented to the village by Mr. W. H. Lever. The church, which is of Helsby red sandstone, will seat 600 persons, but can accommodate 1,000. It is 151 ft. in length by 51 ft. in width, with transepts projecting about 22 ft., and there is a tower at the south-west corner carrying a peal of bells. The chancel is 47 ft. by 27 ft., and has accommodation for a choir of fifty there being at the end three stained-glass windows, erected by Mr. Lever in memory of his late father and mother. The organ of four manuals has been built by Messrs. Henry Willis and Sons, of London. The roofs of the building are open timbered of pitch-pine, while the pews and pulpit are of oak, the aisles and chancel being floored with black and white Italian marble pavements. The general building has been carried out by Messrs. Lever's building department, the font, pulpit, lighting, stained glass, etc., having been entrusted to contractors. The architects were Messrs. W. and Segar Owen, of Warrington.

NEW CHURCH, NORTHAMPTON.—The foundation-stone of Christ Church, Northampton, was laid on the 8th inst. It is proposed to erect the nave and aisles and the two transepts, and for the present a temporary chancel will be arranged out of a portion of the nave, and temporary vestries out of a portion of the north transept. The accommodation provided in this first portion will be for about 600, and the estimated cost 5,800*l.*, the amount of the accepted tender submitted by Mr. Robert Cosford, builder, of Northampton. The architect is Mr. M. H. Holding.

NEW CHURCH, SHOREHAM, SUSSEX.—The opening of a new lecture hall and class-rooms in Buckingham-road, Shoreham, took place recently. The work has been carried out from the designs of Mr. E. J. Hamilton, architect, Brighton, by Mr. W. Willett, builder. The new building is part of a scheme which, when completed, will comprise a church to accommodate about 300 to 320, with nave, shallow transepts, and western gallery. The gallery staircase will be contained in a small tower, with octagonal lead roof. In the rear of the church the buildings already completed comprise lecture hall, 29 ft. square, with vestry, and five class-rooms, three of which are divided off from the lecture hall by roller shutters, adding some twenty sittings to the hall when required. The walls are faced externally with stock bricks of buff colour, with red terra-cotta dressings, the roofs being covered with red tiles. It is intended also to erect a manse upon the site.

ADDITIONS TO ST. PETER'S CHURCH, LOWESTOFT.—The Lord Bishop of the Diocese dedicated recently the new chancel, side chapel, reredos, etc., at St. Peter's Church, Lowestoft. The architect for the new work is Mr. E. P. Warren, Westminster, and the contractors Messrs. Collins and Godfrey, of Tewkesbury. The new portion of the building forms part of a complete scheme for a new church. The reredos has a carved, coloured, and gilded frame. The centre panel represents the Crucifixion, with the figures of St. Mary and St. John on either side of the cross, and is the work of Mr. R. Anning Bell, who modelled and coloured the panel, which is cast in hard fibrous plaster. The panels of the wings are paintings by Mr. W. D. Adams, of Dorchester. The reredos itself, designed by the architect, has been carried out by Mr. T. E. Jago, Westminster. The hangings above and beside it, as well as those in the side chapel, are by Mr. H. S. Ashwin, of Stoke-on-Trent. The east window has been executed by Mr. Christopher Whall. The sanctuary is paved in large squares of black and white marble. The new nave, when completed, will provide a large congregational area with an unrestricted view of the altar, the aisles being wing passages carried by means of arches through the heavy internal buttresses which resist the thrust of the wide-spanned roof.

NEW CHURCH, BALSALL HEATH, BIRMINGHAM.—The consecration of the Church of St. Barnabas, in Ladypool-road, Balsall Heath (which has now been completed, with the exception of the tower, by the building of the nave), took place recently. The structure has been built of red brick and terra-cotta. The plans for the work were prepared by the late Mr. J. F. Proud, and elaborated after his death by Messrs. W. Hale and Sons.

CHURCH RESTORATION, IDDESLEIGH, DEVONSHIRE.—The old church at Iddesleigh has just been restored. The Church of St. James' is an ancient building in Gothic style, and comprises a chancel, nave, aisles, south porch, over which is a sundial, and an embattled western tower, with pinnacles, containing four bells, of which the first two are dated 1620, and the third, 1629. The tenor has an invocation in old English characters to St. George. Under an obtuse arch in the north aisle is the recumbent, cross-legged effigy of a knight in chain mail, covered with a cyclas. The effigy is reputed to be that of an ancestor of Sir John Sully, K.G. Iddesleigh Church was repaired and partly rebuilt in 1848, at a cost of about 400*l.*, whilst it was restored in 1879 at an outlay of 2,500*l.* A window was put in at the expense of the parishioners to the memory of Stafford Henry, first Earl of Iddesleigh, G.C.B., P.C., who died on January 12, 1887. There are sittings in the church for 120 persons, and the register dates from the year 1538. The present restoration has been carried out at a cost of a little over 200*l.*, and most of the work has been on the old tower. The whole of the stucco, which did not add to the appearance of the building, has been taken off, and the tower has been repointed and thoroughly renovated, whilst the ring of four bells has been rehung. Provision has been left for the reception of two more bells. The organ, which was placed in the church some four or five years ago, somewhat obscured the Iddesleigh window, and the window has now been moved from the north-east end of the church to the tower. The work has been carried out under the direction of Mr. James Hooper, of Hatherleigh, architect.—*Western Morning News.*

TOWER, PARISH CHURCH, LLANEGWAD.—The new memorial tower of the Parish Church of Llanegwad, Carmarthen, was dedicated by the Lord Bishop of St. David's on the 12th inst. It is planned for a peal of bells to be added later on, from the design of Mr. David Jenkins, architect, Llandilo, and built by Mr. W. D. Morgan, contractor, Gwynfe, Llangadock, at the expenditure of 700*l.*

WESLEYAN CHURCH, LIVERPOOL.—On the 2nd inst. the foundation-stone was laid of the new Wesleyan church and schools in Wellington-avenue, Smithdown-road. The church is to be built in the classic style, with the schools as a separate building. It is designed to accommodate 678 persons, with 284 of the seats in the gallery on three sides of the church. There will be three vestries, and the organ will be placed in a recess behind the choir seats. The pews will be pitch-pine, and the ceiling of plaster, with mouldings and enrichments. There will be an arch in front of the organ recess, with enriched spandrils of fibrous plaster, and the main windows will be leaded lights. The school assembly hall will be 60 ft. by 34 ft., and will have an end gallery, and there will be in the school buildings an adults' room and an infants' room, and six additional class-rooms, there being separate entrances for boys and girls. The cost, including the site, will be 10,000*l.* The architects are Messrs. W. J. Morley and Son, of Bradford, and the builders, Messrs. S. Webster, of Bootle.

BAPTIST CHURCH, NORWICH.—The foundation-stone was recently laid of the new Baptist church in Dereham-road. The new church faces north and south, its south elevation looking on to Dereham-road, with a return frontage to Goldsmith-street. The architect is Mr. A. F. Scott, and the church will be of brick with Costessey ware dressings.

WESLEYAN CHURCH, BISHOPSTON, BRISTOL.—In connexion with the scheme for renovating and extending Bishopston Wesleyan Church, the memorial stones of the new church parlour were laid a few days ago. The church parlour will be 34 ft. long and 21 ft. wide, having a coved and panelled ceiling with moulded ribs, all of selected pitch-pine. The cost of the work now in hand will be between 1,200*l.* and 1,300*l.*, and is being carried out from the designs and under the direction of Messrs. Herbert J. Jones and Son, architects, by Mr. T. R. Lewis, builder.

CONGREGATIONAL CHURCH, DOVERCOURT.—A new Congregational Church has been opened at Dovercourt. The site of the church is in Cliff-road. The building is of red brick, with a concrete roof. The windows are filled with lead lights of tinted cathedral glass, with ruby margins, supplied by Messrs. G. Farmiloe and Sons. The additions will be made at the south end, where the tower will be, and over entire length of the extended school-rooms. Mr. H. H. Packer is the architect.

BAPTIST CHURCH, BLACKPOOL.—The foundation-stones of the new Baptist Tabernacle, at Blackpool, were laid on the 15th inst. The new place of worship is being built in Springfield-road. The exterior is in red bricks with stone dressings. On the ground floor seating for 470 is provided, and for 290 additional in the horse-shoe gallery. The school block in the rear contains a large hall, with seating for 300, a ladies' room, and the hall and staircase on the ground floor. The first floor is divided into seven class-rooms. Heating will be by low-pressure hot-water pipes and radiators, and the lighting by electricity. Messrs. W. T. Oldrieve and C. A. Hindle, of Manchester, are the joint architects, and Messrs. Parkinson and Sons, Ltd., of Blackpool, are the builders.

FREE METHODIST CHURCH, WHITLEY BAY.—The Whitley Bay United Free Methodist Church, which was destroyed by fire some months ago, is about to be rebuilt. Mr. W. H. Knowles, architect, Newcastle, was recently instructed to prepare plans and designs for a new church, at a cost not exceeding 3,000*l.* The building, which will be of red pressed bricks with stone dressing, will be constructed by Mr. A. Styan, builder and contractor, Whitley Bay.

FREE METHODIST CHURCH, PRESTON.—The foundation-stones of the new Free Methodist church and schools, which are to be erected in Deepdale-road, Preston, were laid recently. Mr. G. E. Balshaw, of Southport, has prepared plans of the school and church buildings. It is proposed to build the school first, and the anticipated outlay will be about 2,400*l.* With the class-rooms, accommodation will be found in the school for 600 people. A schoolroom, 47 ft. by 32 ft., is to be provided, with gallery at one end, and ten class-rooms eight of which are arranged in one side of the schoolroom and two at the end below the gallery. Four of the class-rooms on the ground floor are so arranged that they can be opened out to the main schoolroom for special occasions, to give additional seating accommodation. A lecture-room, or class-rooms three and four, when thrown together, is capable of seating ninety-five persons. The premises will be heated throughout by hot water. Valves are so arranged that certain rooms can be heated together with the schoolroom, or separately, as required. It is proposed to face the elevations with best Accrington facing bricks, with dressings of Longridge or other approved stone. The internal joiners' work is to be of pitch-pine, varnished, and the external woodwork of red deal, painted.

NEW CONGREGATIONAL CHURCH, HERNE-HILL.—The new Congregational church, at Herne-hill, was opened on the 11th inst. The building stands on a site at the corner of Denmark-hill and Red Post-hill. The design is Gothic of the decorated period. Red bricks and grey terra-cotta are used for the exterior, and light-tinted bricks for the interior. The nave is 76 ft. in length and 30 ft. in width. There are also two side aisles, north and south transepts, chancel, and organ chamber. The architect is Mr. Alfred Conder. At the rear of the church there is a hall measuring 38 ft. by 20 ft., minister's and deacons' vestries, and other accommodation. The church is at present seated for a congregation of 450 persons, but the plan adopted admits of a gradual extension of the accommodation up to about 800 sittings. The buildings are fitted throughout with the electric light. The entire outlay upon the work has been about 8,500*l.*

WESLEYAN METHODIST CHAPEL, UPPER KNOWLE, BRISTOL.—The Wesleyan Methodist school-chapel at Upper Knowle, the memorial stones of which were laid recently, is being erected on a triangular-shaped piece of land at the junction of Redcatch-road and Wells-road. It is the first instalment of a scheme which includes a church with tower and spire, with accommodation for 700 persons, also lecture hall, vestries, etc. The present erection comprises a school-chapel, 50 ft. by an average of 40 ft., with transepts available for use as class-rooms; also an infant school, a church parlour (capable of division into two class-rooms), and four other class-rooms. There is also provision for tea meetings, library, lavatories, etc. The school-chapel will be seated for 350 adults, and will have an open roof and traceried windows with leaded lights. The ground floor rooms will be laid with wood blocks on cement concrete, supported by steel joists. The buildings are being erected in pennant stone with Bath stone dressings, and the roofs will be covered with red Broseley tiles. The premises will be warmed by hot water, and the total cost will be about 4,000*l.* The architects are Messrs. La Trobe and Weston, and the contractor Mr. C. A. Hayes.

SCHOOLS, BARRY.—At a special meeting of the Barry Education Committee, it was decided to recommend to the district council the purchase, at an estimated cost of 900*l.*, from the Holton Estate Company, of three-quarters of an acre of land, adjoining the present High-street schools, for school extension purposes, and the architect, Mr. G. A.

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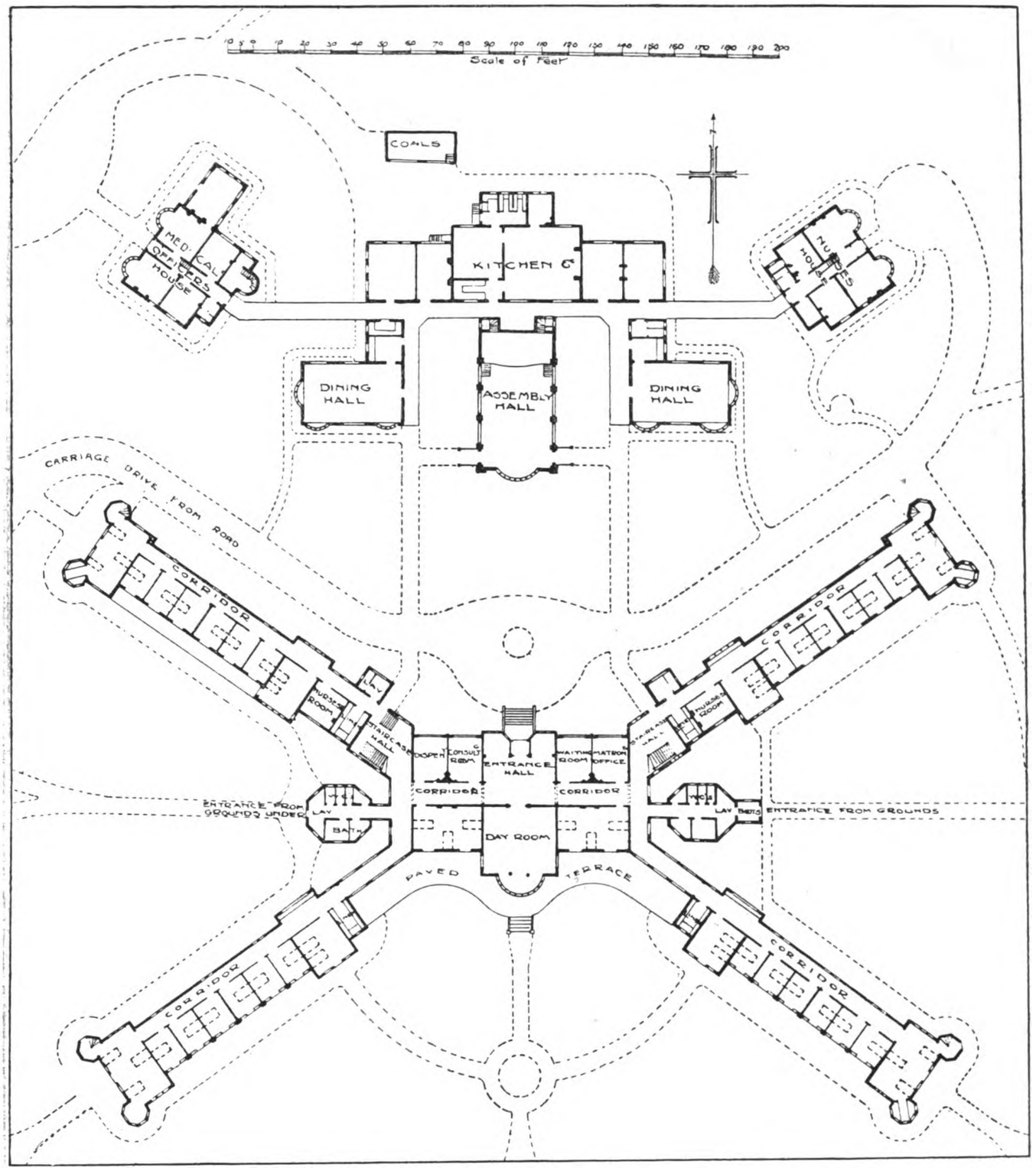

Plan of Brompton Hospital Sanatorium and Convalescent Home. Heatherside, Surrey.

Birkenhead, was instructed to prepare plans for a new girl's school, to accommodate 400 children, to be erected on this site; and for the erection of a new boys' school in Romilly-road, instead of a girls' school as previously intended, with a central hall, 62 ft. by 32 ft.

NEW SCHOOLS, LEYLAND, LANCASHIRE.—The new Balshaw's schools, at Leyland, were opened recently. The building provides four class-rooms, each capable of accommodating twenty-five pupils, making a total provision of 100 seats. The assembly hall has a parquet flooring, and there are separate cloak-rooms and playgrounds. The old school has been converted into a chemical and physical laboratory. The cost of the new building and the improvements effected at the old premises has been between 3,000*l.* and 4,000*l.* Mr. Catterall, architect, prepared the plans for the work.

SANATORIUM AND CONVALESCENT HOME, HEATHERSIDE.—This sanatorium, opened a few days ago, is in connexion with the Brompton Consumption Hospital. The want of a branch in the country to which convalescent patients could be sent had long been felt, especially since the development of the principle of open-air treatment of tuberculosis came prominently before the public. The site was chosen after careful inspection of a number of places in Surrey, Kent, Middlesex, and Buckinghamshire, the choice of the present site resulting from its conspicuous advantages in elevation, soil, and shelter, water supply, and accessibility. The sanatorium stands on the Chobham Ridges, Surrey, 400 ft. above sea-level, which border the large tract of unenclosed moorland belonging to the public, over which the War Office has acquired certain rights for military purposes. The sanatorium grounds face, for the most part, south, and command a fine view over Frimley Common, Farnborough, and Aldershot. Except on the south the grounds are surrounded by the pine woods of the Heatherside estate, of which they were a part. The soil is gravel and sand, belonging to the upper Bagshot series, and has a reputation for dryness. The sanatorium, which has taken two years to complete, is arranged as shown on the accompanying plan. A two-storied block of stellate form rises into three stories in the centre, for the reception of 100 patients. The central part includes the board and day-rooms, the matron's apartments, and pharmacy, and some of the larger wards, while the four radial pavilions contain the majority of the wards, which are principally single-bedded. These face S., S.S.W., and S.S.E., and are so arranged that no portion of the building is shaded by another. The height of the wards is 10 ft., and the cubic space per patient about 1,300 ft. There is a fire-escape staircase at the end of each pavilion, and further, two of the pavilions are cut off from the rest of the block by a corridor of fire-resisting construction with a glass roof. The wards are designed to have windows open day and night with protection from weather and glare, and the lower story is so arranged that patients in bed can be wheeled out on to the terrace, to be under the full influence of the sunshine and atmosphere. Open balconies are formed at the end of each pavilion, and, in addition, large rest shelters will be erected in the sanatorium grounds. Two detached sanitary towers on either side of the central building, and connected with it by gangways, contain the bathrooms, water-closets, lavatories, and housemaids' closets. A second group contains the two dining-rooms, and a large recreation-room, and behind there are the kitchen and offices, and on either side connected by covered ways, are the residence of the medical officers, and the home for nurses. At some distance from the sanatorium is the machinery block, containing the boilers and

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engine-houses, the laundry, the electric plant, the mortuary, and the laboratory. The institution will be lighted by electricity, generated on the premises; electric motive power will be used in the laundry. The heating will be principally by hot water radiators. The water supply is from the Frimley water-works, which are at a short distance from the sanatorium, and the drainage is connected with the Frimley main drainage scheme. The architect is Mr. Edwin T. Hall, of London, and the contractors are Messrs. Holliday and Greenwood, also of London.

METHODIST CHURCH, SNEINTON, NOTTS.—The memorial stones of the new Methodist church at Sneinton, were laid recently. The building will comprise a chapel, 60 ft. long by 39 ft. wide, with a transept on either side. There will also be a choir, 24 ft. wide by 18 ft. deep. Seating accommodation will be provided for 450 persons. Underneath the chapel will be a hall, 42 ft. long by 39 ft. wide, and five extra class-rooms. The main entrance is to be from the corner of Sneinton-boulevard and Thurgarton-street, but two staircases are to be provided for the schoolroom. Two vestries, one on each floor, will also be furnished, these having a separate staircase. Both the chapel and school are to have a wood dado to a height of 4 ft. 6 in., and above this the walls will be colour-washed. Externally the work will be carried out in brick, with stone dressings. The builder is Mr. John Lewin, of Netherfield, and the architect Mr. W. H. Higginbottom, of Nottingham. The cost, it is roughly estimated, will be about 5,000*l.*

QUEEN VICTORIA MEMORIAL SCHOOL, DUNBLANE.—The plans for the proposed Victoria Memorial School for the Sons of Scottish Sailors and Soldiers have now been accepted by the committee, and will be put before the War Office for its approval, with a view to having the works started at the earliest possible date. A site near Dunblane has been secured for the school. The buildings it is proposed to erect include the administrative department, dining-hall, kitchen, class-rooms, common hall, and dormitories in the main building. Separate houses are provided for the adjutant and head-master. There are also to be a swimming bath, hospital, laundry, engine-house, and parade and play grounds. The buildings are to be lit by electricity. The completed scheme, accommodating 300 boys, is estimated to cost between 60,000*l.* and 70,000*l.*, and the plans have been so arranged as to admit of extension. In the plan a site is retained for a memorial chapel, but the cost of its erection is not included in the estimate, and the hope has been expressed that some private donor might provide the money for this part of the scheme. The architect is Mr. John Archibald Campbell, I.A., Glasgow.

HAGGERSTON PUBLIC BATHS.—The accommodation provided in these baths includes a large swimming bath, 100 ft. long, 35 ft. wide, and of a varying depth from 3 ft. 6 in. to 6 ft.; seventeen men's and five women's first-class, and forty-nine men's and nineteen women's second-class slipper baths; an entrance hall, 28 ft. by 16 ft., with a central ticket office; public cloak-rooms, a large swimmers' club room, a public laundry, fitted with sixty washing troughs and drying horses, and five hydro-extractors, mangling and waiting-rooms, a board-room, and, in the attic story, residential accommodation for the superintendent. The boiler-house, the heater-room, the establishment laundry, and the store-rooms are placed in the basement floor. In planning the swimming bath an attempt has been made to solve the problem of enabling a large body of spectators to obtain an entirely unobstructed view of the whole water area of the bath. The spectators' seats are in three stages, the lowest of which is placed about 18 in. above the level of the bath platform, the dressing-boxes, sixty-nine in number, being arranged immediately behind the top stage of the public seating, which is planned to accommodate about 300 persons. The engineering plant comprises three Lancashire boilers, 28 ft. long by 7 ft. in diameter, connected with the requisite feed and condense pumps, steam injectors, suction and delivery pipes, valves, etc.; a Green's patent fuel economiser, fitted with an electric motor for driving the scrapers, two large multitubular reservoir heaters, and electric motors for actuating the wash-house machinery and the ventilating fans. The general heating is effected by radiators placed in the various rooms and corridors, and connected with a low-pressure hot-water heating apparatus. The walls of the swimming-bath hall, the suites of slipper baths, the public and establishment laundries, and the public corridors and staircases are faced, and the bath tank lined, with enamelled bricks, supplied by the Farnley Iron Company. The arched roof principals of the swimming bath are of steel, encased in ribs of panelled plaster; the lower portions of the lantern light are of glazed terra-cotta, supplied by the Leeds Fireclay Company, fitted with iron casements, and the upper portions have fixed glass roofs and domes. The bath platforms are paved with patent interlocking rubber tiling, the gallery staging is of teak, and the enclosures of the slipper baths are formed with slabs of St. Anne's marble. Messrs. Killby and Gayford were the general contractors, and the constructional steel work has been supplied and fixed by Messrs. Homan and Rodgers. The engineering plant was installed by Messrs. Z. D. Berry and Son; Messrs. Hemmingway and Pritt carried out the electric lighting; the ornamental metal work was supplied by Messrs. Benham, Froud, and Thos. Elsley, Ltd., and the ship vane by Mr. George Wragge. The figures, in low relief, on the pediment of the main front were modelled by Mr. F. E. Schenk, and carved by Messrs. Martyn and Co. Externally, the buildings are faced with Lawrence's red bricks and Portland stone. Mr. H. Barton was the general foreman, Mr. F. C. Saunders the clerk of the works, and Mr. A. W. S. Cross, the architect. The total cost of the buildings was about 60,000*l.*

STAINED GLASS AND DECORATION.

NEW WINDOWS, EGERTON CHURCH, ASHFORD.—Messrs. Percy Bacon and Brothers, London, have just completed the east window at this church, having added two side lights of stained glass, the centre light having been put in some time ago. The figures are St. Mary, in the left, and St. John, in the other light, on either side of the Crucifixion, which is depicted in the centre light. They have also executed and fixed in the same church a memorial window to the late John and Maria Payn.

STAINED GLASS MEMORIAL WINDOW, ANCASTER, NOTTS.—A stained-glass memorial window, which has been placed in the north aisle of the parish church at Ancaster, was recently unveiled. The window contains three panels, and has been designed and executed by Messrs. Clayton and Bell, of London.

SANITARY AND ENGINEERING NEWS.

THE SANITARY CONDITION OF GLASGOW.—Mr. Peter Fyfe, chief Sanitary Inspector for Glasgow, in his annual report on the work of his department, says that the year 1903 marks the lowest death-rate in the history of Glasgow, being 18·405 per cent., against 20 and 21·2 for 1902 and 1901 respectively; 14,483 persons died last year, in place of 15,532 in 1902, in a population estimated by the Registrar-General at 11,460 more than then, his estimated population for Glasgow in 1904 being 798,357. Out of the 45,308 nuisances which were recorded in 1903, 13,545 were due to drains, soil pipes, and branches choked, etc. The work of closing unwholesome dwellings was greatly supplemented during the year by the energy displayed by the Sub-Committee on Back Lands and Uninhabitable Areas, as, through the representations of the Medical Officer of Health, under the Housing of the Working Classes Act, a large number of most insanitary buildings, mostly of the type known as "back lands," were condemned, and have been closed and removed. These operations have gradually reduced the number of "ticketed" houses to 19,145, in which during the year 49,172 inspections were made for the abatement of overcrowding. As the result of these, 3,758 houses were found overcrowded, or 7·64 per cent. For the previous year the percentage was 8·3, and in 1901 it was 12·7. A disquieting feature in connexion with the housing of the labouring classes in Glasgow is the growth of overcrowding in houses above the size of those at present known as "ticketed." An organised course of night visitations to houses over 2,000 cubic ft. was made during the year in suspected localities, with the rather startling result that out of the 1,345 dwellings inspected 157 were overcrowded, or 14·69 per cent. of the total. The work inaugurated in 1902 by the Magistrates in connexion with the better sanitation of licensed premises was continued in 1903. Practically the whole of them are now into line with the requirements of the licensing bench. In the matter of smoke prevention steady improvement continues to be made.

FOREIGN.

AUSTRALIA.—The late Mr. Alfred Felton, of Messrs. Felton, Grimwade, and Co., chemists, of Melbourne, left a will dated August, 1900, in which nearly the whole of his fortune, amounting to about 500,000*l.*, was given to the Art Gallery and the charitable institutions of Victoria. The portion of the income to be utilised for art purposes is to be employed in the purchase "of works of ancient or modern art, antiquities, or other works or objects of artistic or educational value, calculated to raise or improve the public taste." These works will be placed in the Melbourne Art Gallery. Mr. Felton has not hampered the committee with any stipulations as to the art purchases for the National Gallery, and the Melbourne Art Gallery is given leave to make selections from the deceased gentleman's magnificent collection of pictures and articles of virtu. Any selections or any purchases are to be labelled "The Felton Bequest."

GERMANY.—Dr. Walter Reichel has been elected professor of electricity in the Technical Schools, at Berlin.——New medical schools, to be called the Empress Frederic Schools, are to be built at Berlin, from the plans of Herr Ihne.——The new church at Pasing, near Munich, designed by Professor Hocheder, has been completed, at a cost of 125,000 francs.——The new Natural History Museum, at Munich, is to be erected on the island Kohlen, on the Isar.——A new theatre is to be built at Dresden.——The new technical schools for engineers, at Breslau, have been opened.——A theatre, suitable for operas and important representations, is to be built at Stuttgart, from the plans of Professor Littmann; later it is proposed to add to the building a smaller one, suitable for concerts, etc.——The architect, Herr Neher, has undertaken the building of the Museum for the Senckenberg Natural History Research Society, at Frankfort; this building is to form a continuation of the new Senckenbery library, designed by Herr von Hoven.——The theatre at Bielefeld designed by Herr Bernhard Sehring was opened on Easter Sunday.——The Church of St. John at Mannheim, the work of the architects Curjel and Moser, was consecrated on May 29.

AUSTRIA—The new Physiological Institution attached to the Vienna University, and designed by Herr Gottlieb Jaroschka, was opened on May 2.——The Roman Museum which is in course of construction at Vienna has been designed by the architects Ohmann and Kierstein, and is intended to contain the results of the excavations in Lower Austria.——A new Evangelical church is to be built at Aussig according to the designs of Herr Zeissig.——A second synagogue is to be built at Brünn.——Herr Hans Miksch, a well-known architect in Vienna, died suddenly last month at Dresden.

SWITZERLAND.—The architect Herr Karl Moser has been entrusted with the building of the new Art Gallery at Zurich.——The Evangelical church at Rorschach designed by Professor A. Müller is completed.——The church at Vitznau designed by Herr Reber has also been completed.

UNITED STATES.—Considerable interest is excited by the programme of the competition for the Carnegie Technical Schools at Pittsburgh. The competition is for the selection of an architect not of a design, and no limit of cost is named. Five firms have consented to take part in the competition for a fee of $1,000 each—viz., Messrs. Carrère and Hastings, Cass Gilbert, Howells and Stokes, G. B. Post (all of New York), and F. Miles, Day, and Brother (Philadelphia). Other architects will be admitted to compete on satisfying the committee that they have done work of sufficient importance and merit their acceptance as competitors. The intended site includes thirty-two acres of ground, more than twelve acres of which will be covered by buildings, in five groups. Designs are to be sent in by September 10.

MISCELLANEOUS.

THE SURVEYORS' INSTITUTION CONVERSAZIONE.—The annual conversazione of the Surveyors' Institution was held on Thursday evening last week at the Natural History Museum. The members and guests were received in the central hall by Mr. and Mrs. H. T. Steward, and the function was attended by a large company. During the evening the string band of the Royal Engineers performed an interesting selection of music, and glees and part songs were also sung during the evening. The excellent general arrangements for the comfort and entertainment of those present contributed much to the success of the gathering.

FRENCH STONE EXPORTS.—According to a report received by the Foreign Office from Mr. Consul Loftus on the trade and agriculture of the district of Cherbourg for the year 1903, there has lately been some uneasiness amongst the Cherbourg firms interested in the stone trade on account of German competition. The amount of stone exported from Cherbourg, however, showed a considerable increase for the year, being about 118,963 tons, as compared with 85,226 tons exported during 1902. This trade is still, and has been for some years past, one of the best paying in Cherbourg, and is certainly one of the principal industries of the town, bringing, as it does, a continual stream of small ships from the United Kingdom, which come to the port light, or in

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ballast, expressly to load with this stone for road-making in the South of England. The stone is of a soft nature, though excellent for road-making, and is shipped to Poole, Shoreham, Newhaven, the Thames, Folkestone, Fareham, and numerous other ports on the south coast of England, all the carrying trade being done by British vessels. A harder quality of stone is quarried near Cherbourg, at Fermanville, and is shipped in small quantities from Dielette. The average cost is 6s. per ton of macadam, the stone being broken into 1½ in. and 2 in. cubes; larger sizes are cheaper, 2½ in. stone being 5s. 9d. per ton. The price in the United Kingdom is about 10s. 2d. to 10s. 6d. per ton in port, whilst the price per ton delivered on the roads paid by some county councils in the South of England was between 18s. and 18s. 6d. in 1903.

ENLARGEMENT OF THE PATENT OFFICE.—In view of a large increase of the technical staff, rendered necessary by the provisions of the Act of 1902, which, it is anticipated, will be put into active operation on January 1 next, the Commissioners of H.M.'s Office of Works have recently erected new buildings on the north side of Quality-court, Chancery-lane. The block affords accommodation for some forty members of the staff; it occupies the site of the last remaining portion of the old office, as designed by Sir William Chambers, with a Roman Doric order and pediment upon a rusticated base—his last executed work in London. Additional room for about 200 will be provided, in pursuance of an Act of last year, in a building, for which the plans are being prepared, on a site in Furnival-street, Holborn, adjoining the present office buildings in Staple Inn and Took's-court. The total cost of the new Patent Office is estimated to be 167,750*l.*, of which sum about 166,000*l.* has already been spent. The new Patent Office at Berlin will cost, it is computed, about 700,000*l.*

PHILIPPINES COMMERCIAL MUSEUM.—Great progress is reported in connexion with the Commercial Museum established at Manila in October, 1902. The aim of the Museum is to encourage the resources of the Philippine Archipelago, and to aid in the extension of its domestic and foreign trade relations. Its work consists of collecting and exhibiting the commercial products of the islands, both in a crude and manufactured form, procuring for the convenience of local importers and foreign exporters an extensive and well-selected exhibit of articles imported from foreign countries, and exhibiting Philippine products in foreign markets. Every article exhibited will be marked with its name, name of manufacturer and exhibitor, use, price, etc., and will be displayed to the best advantage. Exhibits should consist of articles which are useful in the various forms of agriculture as practised in the Philippines, in lumbering, mining, and road-making, builders' hardware, mechanics' tools, blacksmiths' tools, electrical appliances and supplies, engineers' and plumbers' stores and tools, paints and oils, office and household furniture, etc.

THE "SECURA" FLOOR SYSTEM.—The flooring to which this name is given consists of a flat arch construction built of hollow blocks, the principal feature in which is that the internal stays are arranged obliquely in the direction of the line of maximum pressure, so that no strain may be experienced likely to break the stays. The blocks are intended to be placed between the girders, and covered with a surface of cinder, or other concrete. This system, with the exception of the distinctive feature mentioned, is not materially different from numerous forms of hollow tile flooring already well known in this country. Its use has been confined hitherto chiefly to Germany, where it has been adopted with satisfactory results. In December last some trials were made of "Secura" floors in the new building of the Berlin Patent Office, by Professor Gary, of the Royal Testing Institution, at Gross-Lichterfelds. Load tests were made of one floor, and drop tests upon two others. In the former, the floor was loaded to five times the calculated load, with the result that, in a span of nearly 2 mètres, the deflection was only about 0·5 mm., and in the latter the floor was subjected to the impact of an iron ball weighing about 112 lb., falling from a maximum height of 6·5 mètres. Several attempts were made before the ball damaged the flooring, but even then it only made a funnel-shaped depression, and did not fall through. Although these results are somewhat indefinitely stated, they are sufficient to indicate that the floor system possesses considerable rigidity and strength.

INCORPORATED CHURCH BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday, the 16th inst., at the Society's House, 7, Dean's-yard, Westminster, the Hon. E. P. Thesiger, C.B., in the chair. Grants of money were made in aid of the following objects:—Building new churches at Callowland, Christ Church, near Watford, 200*l.*; Southend-on-Sea, St. Erkenwald, Essex, 120*l.* for the first portion; and Egremont, St. Columba, near Liverpool, 95*l.*, in lieu of a former grant of 80*l.* for the first portion; and towards enlarging or otherwise improving the accommodation in the churches at Ellerburne, St. Hilda, near Pickering, 10*l.*; Lakenheath, St. Mary, Suffolk, 40*l.*; and Wallingford, St. Peter, Berks, 40*l.* Grants were also made from the Special Mission Buildings Fund towards building mission churches at Eltham, St. John the Baptist, Kent, 25*l.*; Llansadwrn, Capel Dewi, Carmarthen, 25*l.*; and St. Ives, St. Nicholas, Cornwall, 50*l.* The following grants were also paid for works completed:—Loudwater, near High Wycombe, 50*l.*; Seighford, St. Chad, near Stafford, 15*l.*; Hemblington, All Saints, near Norwich, 30*l.*; Summerstown, St. Mary, Surrey, 250*l.*; Victoria Docks, Church of the Ascension (Felsted School Mission), Essex, 200*l.*; Alexandra Park, St. Saviour, Middlesex, 100*l.*; Astley, St. Peter, near Stourport, 30*l.*; Shirebrook, Holy Trinity, near Mansfield, 80*l.*; Primrose Hill, St. Matthew, near Huddersfield, 50*l.*; and Bensham, St. Hilda, near Gateshead-on-Tyne, 50*l.* In addition to this the sum of 58*l.* was paid towards the repairs of seven churches from trust funds held by the Society.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The Sixty-first Annual Congress of this Association will be held at Bath, from Monday, August 8, to Saturday the 13th, inclusive. Amongst places of archæological and historical interest, within reasonable distance, which will probably be visited, may be mentioned the following—viz., Wells (the Cathedral, Deanery, and Bishop's Palace); Glastonbury (the Abbey, Museum, and the early British village); Corsham (for Lacock Abbey); Malmesbury (the Abbey); Longleat (the seat of the Marquess of Bath); Calne; Hinton-Charterhouse (the remains of the Carthusian Priory); Norton St. Philip (the Church and XVth-Century Inn); Bradford-on-Avon (the ancient Saxon Church, the Bridge Chapel, and XIVth-Century Tithe-barn); Avebury (the stone circles and earthworks, and Silbury Hill); Caerwent (the ancient Roman station). One whole day, or parts of two days, will be devoted to the antiquities of Bath, and the more immediate neighbourhood, including the Abbey Church, the Roman Baths, St. John's Hospital, and the ancient earthworks on Hampton Down, and the traces of an ancient British village.

SOUTH-WESTERN POLYTECHNIC, CHELSEA.—The lectures on Architectural History, given during the past session by Mr. Banister Fletcher, have been attended by fifty-nine students, and at the examination, held at the conclusion of the course, fourteen students satisfied the examiner, Professor W. R. Lethaby. The names of the successful students are:—*Frank L. Atwell, Major Alsford, Herbert E. Bailly, *Kate Coast, Henry A. Buck, Charles Coxall, Sybil R. L. Gould, *Stephen S. Groom, Jessie A. C. Kosrelka, James H. Morton, *Minnie Thatcher, Lucio Velasco, William F. Wallace, Francis C. Welles. Those with an asterisk against their name received, in addition, a certificate of merit. The scheme of instruction consisted of weekly lectures (at which carefully-selected notes were given out), illustrated with lantern slides, and specially prepared large lecture diagrams, followed by sketching classes and further explanations of the styles under discussion, which were also rendered more easy to understand by large folio reference books for each style. The majority of students were architects' assistants, pupils, engineers, and art students; but a considerable number of students interested in architecture as a necessary part of education were present, especially those who are in the habit of travelling, or who are interested in historical development. For the coming session, which opens at the South-Western Polytechnic on Monday, October 3, at seven o'clock, a series of visits are being arranged to important buildings and museums around London, so that a student may be able to become acquainted with the actual details of architecture, which is impossible to be obtained in a lecture-room only.

CAPITAL AND LABOUR.

EMPLOYMENT IN THE BUILDING TRADES.—According to returns furnished by seventy-eight employers' associations, whose members are estimated to employ about 33,500 workpeople, and by trade unions with an aggregate membership of about 194,700, employment continues dull. Compared with a month ago it shows little change on the whole, but it is worse than a year ago. With bricklayers, employment is reported as dull generally, but slightly better than a month ago, and about the same as a year ago. With masons it was fair in England, and much the same as a month ago, but worse than a year ago; in Scotland it was dull, and showed no improvement compared with either a month or a year ago. With carpenters and joiners, employment was dull in England, and fair in Scotland. The percentage of unemployed trade union carpenters and joiners at the end of May was 5·9, compared with 6·1 at the end of April, and 2·6 in May, 1903. With plumbers, employment was dull. The percentage of unemployed trade union plumbers at the end of May was 9·2, compared with 9·7 at the end of April, and 6·4 a year ago. Employment with plasterers was dull generally. With painters in England it was, on the whole, moderate, and rather better than a month ago; in Scotland it was good and much the same as in April. With slaters and tilers it was dull in England and Ireland, but it was fairly good in Scotland.—*Labour Gazette.*

Legal.

EMPLOYERS' LIABILITY ACT:

QUESTION AS TO AN UNSAFE "SCAFFOLD."

AT the Marylebone County Court on Friday last week, before Judge Stonor and a jury, Thomas Patrick Hill, builder's labourer, 8, Saltram-crescent, Paddington, W., sought to recover 150*l.* damages, under the Employers' Liability Act, against Mr. John McKenzie, builder and contractor, 1, Keslake-road, Kensal Rise, N.W. The plaintiff's claim was in respect of personal injuries, said to have been sustained owing to negligence on the part of the defendant or his foreman.

Mr. Chester Jones, counsel, appeared for the plaintiff; and Mr. W. Shakespeare, counsel for the defendant.

The plaintiff's case, briefly, was as follows:—In April of last year he was in the employ of the defendant, assisting in carrying out a job at the Zoological Gardens, Regent's Park. In order to reach some painting work outside the parrot house, plaintiff and another man, named Barry, required a ladder about 20 ft. long. The foreman told them to see if they could find a ladder of such a length on the job, and when they informed him that they were unable to find one, he replied, "Go on and do the best you can." They accordingly put boards upon a pair of trestles, and upon the boards they placed a pair of ordinary steps, the top leaning against the wall of the house. Barry stood upon the boards, holding the steps, while plaintiff mounted and worked from the steps. As plaintiff was leaning over to one side, the foot of the steps and the boards were suddenly forced outward from the wall, the whole "scaffold" collapsed, and the men fell to the ground. The plaintiff sustained a fractured thigh, and the other man also was injured. Both the defendant and the foreman saw them working upon the "scaffold."

In cross-examination, the plaintiff said that he was experienced in such work as that referred to, and that it was their duty to erect such small scaffolds for themselves. He was aware at the time that it was dangerous to work upon such a scaffold, but they took "all precautions." There were 30-ft. ladders on the job, but these were too long for the work.

Medical evidence having been given as to the plaintiff's injuries,

James Barry, the man who also fell, corroborated as to their failure to find a 20-ft. ladder on the job, and as to the foreman, on being so informed, saying, in effect, "You will have to get at it the best way you can." Witness also stated that the foreman saw them working upon the scaffold, and that both defendant and the foreman were only a little distance off and within sight at the time of the accident.

Mr. Robert Thomas Brown, surveyor, said that, in his opinion, the "scaffold" described was not a proper one, because the weight of the man upon the steps tended to force out the lower part.

In cross-examination, witness, after some hesitation, said that a man with forty years' experience in such work—as the plaintiff admitted he had—would be a fool to work on such a "scaffold."

The defendant denied having seen the two men working from the "scaffold," and stated emphatically that there were, at least, two 20-ft. ladders on the job which the men might have used.

William Thomas Gammon, the foreman on the job, stated that when the men asked for a ladder, shorter than the 30 ft. one, he told them that there was one at the monkey house. He denied having said, "Do the best you can." There were two 20-ft. and one 25-ft. ladders on the job which the men might have used. After the accident, he and another man got a 20-ft. ladder from quite near the

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spot where the accident occurred, and finished the work which the two men had been doing. Witness also denied having seen the two men working upon the "scaffold"; no reasonable man would have worked in such an unsafe way.

Alfred Hawtin corroborated the last witness as to the finishing of the work, after the accident, with a lauder about 20 ft. in length. He had seen two ladders of about that same length on the job before the accident happened.

William Robert McKenzie, son of the defendant, said he knew, as a fact, that there was at least one ladder of about 20 ft. length on the job the day before the accident.

Henry Roberts, keeper of the elephants at the Zoological Gardens, stated that just before the accident occurred, he told the men several times that they would fall. Witness also said that he saw a ladder about 14 ft. or 15 ft. in length near where the men were working.

Further medical evidence having been given,

The jury found (1) that the defendant or his foreman did not see the plaintiff working in a dangerous manner; (2) that the defendant or his foreman were not guilty of negligence, under all the circumstances of the case, in regard to the supervision of the manner in which the men were working; (3) that the plaintiff was guilty of contributory negligence.

This was, of course, a verdict for the defendant, in whose favour his Honour gave judgment, and allowed costs.

ACTION AGAINST ARCHITECT AND ENGINEER.

THE case of Hodgson *v.* Waugh was mentioned to Mr. Justice Grantham in the King's Bench Division this week.

In this case the plaintiff, a merchant, sued the defendant, Mr. John Waugh, an architect and engineer practising in the West Riding of Yorkshire, to recover damages for alleged negligence. Plaintiff's case is that he instructed the defendant to alter a house he had bought in Hertfordshire, that defendant had not followed out his instructions with regard to the alterations made in the house, and that, as a consequence, the plaintiff had been put to great expense, which he claimed from the defendant as damages. The defendant counterclaimed for architect's fees and commission.

On November 9 last the case came before the Court of Appeal (reported in the *Builder* of November 14, 1903) on the appeal of the plaintiff from an order of Mr. Justice Ridley in Chambers, reversing an order of the Master, and directing that the case should be tried at the Leeds Assizes before a jury, the Master having directed that the case should be referred to an official referee. On this appeal the parties agreed that the action should be set down in Middlesex, to be tried before a special jury, and an application was to be made to the Senior Judge of the King's Bench Division for him to decide how the figures in the case should be dealt with. Hence the present application.

After some discussion Mr. Justice Grantham said that the action should be tried before a special jury when the details as to figures could be disposed of.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

11,588 of 1903.—G. E. SHERWIN: *Appliances for Heating Water, and other Liquids.*

This consists in the use of a small tube within a larger tube for conducting steam to the opposite end of the larger tube to that from which escapes the water resulting from condensation of the steam, the tubes being secured by joints at one end only.

13,595 of 1903.—W. THOMSON: *Water Supply Regulators.*

Appliances for regulating the supply of water from pressure mains, embodying essentially a tube, open at one end and perforated at or near its other end, fitted with a regulating spring or a weight, and closing or restricting the outlet aperture or apertures by the action of the pressure water on it.

14,433 of 1903.—G. BAILEY: *Apparatus relating to Hot-water Supply for Baths, and other like purposes.*

In a kitchen boiler, or apparatus, used for heating water for baths, and other like purposes, the combination of a supply pipe controlled by a stop-cock, a hot water outflow pipe controlled by a three-way (or other branch) diverting cock, or an arrangement of branch pipes, one of which has an open end, the other terminating with or without a controlling cock, for supplying said baths or other receptacles for hot water.

16,186 of 1903.—J. S. PULLAN and W. H. MANN: *Machines for Moulding Firebricks, and the like.*

In brick-moulding machines, the employment of an adjustable base bracket at each side of the clay cylinder in combination with a sliding mould formed with two sets of mould recesses, located at such a distance apart that when one set of recesses is below the opening of the clay cylinder the other set of recesses is outside one of the base brackets, together with the mould bases.

16,853 of 1903.—Dr. CARL FREIHERR AUER VON WELSBACH: *Manufacture of Metallic Alloys having Pyrophoric Action, and their Application to the Purposes of Ignition and Illumination.*

The manufacture of metallic alloys composed of one or more rare earths to which iron is added, for producing an alloy having a high degree of pyrophoric action, so that, by the abrasion or concussion of the alloy, sparking of considerable intensity is produced.

25,001 of 1903.—W. OMIT, T. OMIT, and W. OMIT: *Kitchen Ranges.*

This consists of a rising bottom, working upon two eccentrics, cast on the sides of the bottom at back, and raised by means of the pendent plate in front thereof, operated by a lever. It also consists of two side plates, cast with bracket and socket, within which the two eccentrics work, and also with slips to hold the pendent plate and plate behind, both forming part of the cold air excluder.

1,924 of 1904.—W. RICHARDSON: *Cover for Trenches Used to Contain Heating Pipes, and the like, in Buildings.*

A pipe trench covering for use in schools, halls, or other public buildings, in the form of a tray or trough, made of cast-iron or other suitable material, in connexion with which troughing, vertical hot-air ducts, or tubes may be arranged with grating or other form of air escape covering on top, so as to allow the hot air from the trench below to rise freely into the room in any convenient position as may be required.

9,471 of 1904.—E. J. FULGHUM: *Floor Boards.*

This invention has for its object to obviate the loss incurred by short length floor boards, and consists of a floor board, comprising a plurality of short floor-board sections joined together at their transverse ends by binding interlocking joints, whereby they are adapted to resist longitudinal separation and produce a rigid board, said board having its sides tongued and grooved.

1,779 of 1903.—E. KERRY and E. C. KERRY: *Guard for Cellar Flaps or Pavement Lights, or for Opening any Path or Floor.*

A guard of wood or metal is made to fit and run in grooved or tongued runners, and is suspended by weights and cords in such manner that, on opening the flap, the guard rises automatically to a sufficient height to prevent any person passing from falling into the opening. Grooved or tongued runners, either of wood, iron, or other material, are fixed in an upright position, and extend from underside of pavement light or flap to the floor below, the grooves or tongues facing each other. A frame of iron, wood, or other suitable material is made so as to slide freely up and down between the grooves, or upon the tongues. This frame is of sufficient height to enable a suitable portion to stand up above level of pavement or floor, whilst its lower portion is held in position by the grooves in the runners or slides. Cords or wire ropes are fixed to the lower portion of frame, and pass upwards and over pulleys or wheels and downwards again. These are connected to a weight or weights, which are heavier than the frame, so that, on any person lifting the flap, the frame immediately rises to its required height and is held in position by the weight or weights before referred to. A catch is also arranged in the frame, which, when the proper height is reached, will catch on floor or pavement and prevent the frame being pushed down.

23,649 of 1903.—L. C. MULLGARDT: *Construction of Floors.*

In a concrete flooring in combination, a plurality of concrete panels located by metal framework, lengths of woven wire held in suspension by and sagging between adjacent parts of the framework, and incorporated in a plurality of such panels, and serving to unite them as interdependent suspension panels, and woven wire held in suspension by, and sagging between, adjacent parts of the woven wire lengths, uniting said plurality of panels and incorporated in the relative adjacent panels of said plurality and in the respective intermediate end concrete casings of the framework.

11,966 of 1903.—S. VOSS: *Device for Lifting and Setting Coping, and like Building Blocks.*

In a crane, the combination of a vertical mast, a scaffolding for guiding this mast, said scaffolding consisting of vertical posts connected by a horizontal beam and ropes fixed to the vertical posts, and running over rollers fixed to the mast.

9,135 of 1904.—G. BROECKEL: *Partitions or Plaster Structures for Buildings.*

A method of constructing partitions, girder casings, and the like, in which binding wires are employed for keeping the plaster support in position, the distinguishing feature being the stretching of a wire frame in the hooks driven in independently of one another in the different planes, to which frame the mortar support is fixed, and then the second frame fixed, the tension in both ribs being produced by driving the hooks in deeper.

9,539 of 1904.—P. HART: *Rock or Ore Crushers.*

In a rock or ore crusher, the combination of a shaft, a ball or sphere loosely fitted on the upper extremity of said shaft, a spider, shaped internally to receive the lower portion of the sphere, and a gland adjustably fitted to the tripod or spider, and shaped internally to fit the upper portion of the sphere, and means for introducing lubricant between the sphere and socket and the sphere and shaft.

9,569 of 1904.—W. R. PRYKE and W. PALMER: *Eaves Gutters.*

This consists in the addition of ribs, fillets, studs, or projections, of any kind on the outer back surface or wall face of eaves gutters, whether of the O-G, or other form, so that the eaves gutters not only stand out from the wall, and are set in determined positions, but also from the shape at which the ribs, fillets, studs, or projections, are arranged, said gutters become more effective, and prevent the usual front edge overflow in times of heavy rain.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

TO CORRESPONDENTS.

R. L. M. (Below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, manuscripts, or other documents, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

June 10.—By MAY & ROWDEN.

New Bond-street.—No. 151, also 2, Little Bruton-st. (shop and workshops), Corporation lease, g.r. 10*l.* 10s., fine nil, p...	£20,000
Regent-street.—53 and 54, King-st. (warehouse and showrooms), area 2,900 ft., u.t. 15 yrs., g.r., etc., 79*l.*, y.r. 735*l.* 1s.	8,250
Piccadilly.—128, Jermyn-st. (s.), u.t. 11½ yrs., g.r. 42*l.*, y.r. 130*l.*	600
Kingsland.—Wilmer-gdns., f.g.r. 60*l.*, reversion in 33 yrs.	1,475

By NICHOLAS, DENYER, & CO.

Maidstone, Kent.—"Willington-ct.," and 1 acre, f., y.r. 80*l.*	1,400

By NOKES & NOKES.

Forest Hill.—18, Wynell-rd., u.t. 59 yrs., g.r. 7*l.* 10s., e.r. 40*l.*	280

By SALTER, REX, & CO.

Kentish Town.—19 to 37 (odd), Highgate-rd., f., y.r. 596*l.*	8,100

By W. G. SHADRAKE.

Forest Gate.—10, Knighton-rd., u.t. 94 yrs., g.r. 4*l.*, p.	290

By WINDRUM & CLEAVE.

Poplar.—39, 41, and 43, St. Leonards-st., u.t. 49 yrs., g.r. 12*l.*, w.r. 96*l.* 4s.	575
Millwall.—16 and 18, Cuba-st., f., w.r. 59*l.* 16s.	520
Canning Town.—2, Newton-st., f., w.r. 15*l.* 12s.	130
Limehouse.—13, Stainsby-rd., f., e.r. 65*l.*	950

June 2.—By WALTON & LEE (at Cambridge).

Grantchester, Cambs.—"Byron Lodge" and 0 a. 1 r. 8 p., f.p.	1,000

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June 3.—By WALTON & LEE (at Chippenham).
Chippenham, Wilts.—Part of Quarry Ground. 16 a. 3 r. 20 p., f. £400
Freehold Allotments, 19 a. 3 r. 26 p. 800
Upper Ladyfield, 19 a. 3 r. 3 p., f. 750
"Hungerdown Cottage" and 3 a. 0 r. 14 p., f.p. 200

June 4.—By ELWORTHY & SON (at Wisbech).
Wisbech St. Mary, Cambs.—Two freehold and copyhold farms, 111 a. 0 r. 31 p. 4,600
Enclosures of land, 15 a. 0 r. 4 p., f. and c. 610

June 7.—By WALTON & LEE (at Sandown).
Sandown, Isle of Wight.—1 to 5, Broadway-cottages, u.t. 966 yrs., g.r. 7*l.* 10s., y.r. 63*l.* 850
3 to 10, Grove-rd., u.t. 992 yrs., g.r. 16*l.*, y.r. 150*l.* 2,230
Station-av., builder's, wheelwright's and carpenter's shops, u.t. 954 yrs., g.r. 1*l.* 10s., y.r. 29*l.* 14s. 230

By JOSEPH STOWER (at Plymouth).
Little Hempston, etc., Devon.—The Bolton Estate, comprising freehold farms, lands, etc., 3,281 a. 1 r. 16 p. (in eight lots) 62,370
St. Martin-by-Looe, Cornwall. — Freehold farms, lands, etc., 802 a. 1 r. 0 p. (in five lots) 15,245

June 8.—By JOHN HATCH (at Southport).
Southport, Lancs.—Lord-st., "Pavilion Buildings" (shops) and plot of land, area 1,107 yds., f. 16,500

By SALTER, SIMPSON & SONS (at Attleborough).
Griston, Norfolk.—"Hipkins Farm," 47 a. 1 r. 29 p., f. and c. 625
A copyhold enclosure, 7 a. 2 r. 4 p. 120
Caston, Norfolk.—Enclosure with plantation, 7 a. 1 r. 6 p. 225
Besthorpe, Norfolk.—A freehold farm, 165 a. 3 r. 16 p. 2,950
Shropham, Norfolk.—A freehold holding, 2 a. 1 r. 1 p. 100

June 9.—By JOSEPH STOWER (at Penzance).
Ludgvan, etc., Cornwall.—The Bolton Estate, comprising freehold farms, lands, etc., 2,710 a. 2 r. 37 p., including the "Advowson of Ludgvan" and the "Manor of Ludgvan Leaze" (in numerous lots) .. 73,665
"The Star Inn" and 0 a. 2 r. 32 p., f. 1,225
"The Old Inn" and 0 a. 1 r. 17 p., f. 750
Towednack, Cornwall.—The lordship of the Manor of Porthia (otherwise St. Ives), with its rights, etc. 380

By RAWLINS & CO. (at Croydon).
Sanderstead, Surrey. — Sanderstead-rd., etc., seven freehold building sites (in lots) 1,555

By ALEXANDER MOSSMAN (at Uxbridge).
Hayes, Middx.—West End, an enclosure of freehold building land, 2 a. 2 r. 3 p. 600

By FOX & VERGETTE (at Crowland).
Crowland, Lincs.—Various enclosures, 71 a. 0 r. 4 p., f. 3,525
Various enclosures, 26 a. 0 r. 0 p., f. 1,260
A freehold wash-meadow, 12 a. 3 r. 10 p. .. 640

June 10.—By FRANKLIN & JONES (at Wallingford).
Ewelme, etc., Oxon.—"Day's" and "Warren's" farms, 339 a. 3 r. 17 p., f. 2,000
Six freehold cottages, y.r. 19*l.* 5s. 215
Benson-on-Thames, Oxon.—High-st., "Mulberry Cottage," f., p. 575
High-st., freehold house and shop, y.r. 20*l.* . 440
Four freehold cottages, y.r. 22*l.* 8s. 255

By D. ROBERTS & SON (at Corwen).
Llangwm, Denbigh.—Two freehold farms, 125 a. 3 r. 8 p., y.r. 91*l.* 2,500
Five enclosures of land, 3 a. 3 r. 19 p., f. .. 275
Llanfihangel, Denbigh. — Three enclosures, 3 a. 2 r. 4 p., f. 110
Cerrigydruidion, Denbigh. — Three freehold farms, 359 a. 3 r. 39 p. 2,800

By JOSEPH STOWER (at St. Ives).
St. Ives, Cornwall.—"Barnoon House" and 0 a. 0 r. 25 p., f., y.r. 5*l.* 5s. 1,510
Fore-st. (s.), and tenement, f., y.r. 7*l.* 10s... 190
Bunker's-hill, four cottages and premises, f. 220
Island-rd., etc., seventeen plots of land, with buildings and erections thereon, also the Island Wastrel 720

By G. B. HILLIARD & SON (at Chelmsford).
Rettendon, Essex.—"Bourne's Farm," 26 a. 0 r. 17 p., c. 250
Four freehold enclosures, 17 a. 3 r. 36 p. .. 180
East Hanningfield, Essex.—"Neville's" or "Sewell's" farm, 13 a. 2 r. 15 p., f. 170
"Licey's" or "Lacey's" farm, 20 a. 1 r. 27 p., f. 500
"French's" farm, 83 a. 1 r. 24 p., f. 1,400

June 11.—ELWORTHY & SON (at Wisbech).
Wisbech St. Mary, Cambs.—"Inham Hall Farm," 125 a. 0 r. 5 p., f. 5,650
Old pasture land, 5 a. 0 r. 3 p., f. 525
Emneth, Norfolk.—Two enclosures of land, 17 a. 0 r. 36 p., f. and c. 500

By STAFFORD & ROGERS (at Bedford).
Wilstead, Beds.—"Town Close," 3 a. 3 r. 35 p., f. 165
Freehold cottage and pightle, 1 a. 1 r. 31 p. 100
"Sanfoin's Enclosure," 14 a. 1 r. 27 p., f... 210

June 13.—BRODIE, TIMBS & CO.
Highgate.—Fitzroy Park, "The Limes," beneficial lease for twelve yrs., head rent 65*l.*, with p. 300

HILLIER & PARKER.
Regent Street.—8, Foubert's-pl., f., y.r. 97*l.* 10s. 2,130

ROBINS & HINE.
Battersea.—25, Lavender-ter., and stabling, u.t. 33½ yrs., g.r. 3*l.* 18s., w.r. 33*l.* 16s... 255

ALFRED SAVILL & SON.
Bilsington, etc., Kent. — "Rowland-st.," "Lower," and "Noakes" farms, 233 a. 1 r. 2 p., including the "Manor of Westbury" (in lots) 2,922

ALEX. H. TURNER & CO.
Godstone, Surrey.—"Alwinton" and 4 acres, f., p. 3,150

WM. WILLETT.
Hampstead.—4, Williams-mews, u.t. 60 yrs., g.r. 10*l.*, y.r. 65*l.* £740

June 14.—ARTHUR BLACKFORD.
Marylebone.—34, Great Barlow-st., with yard and stabling, u.t. 18 yrs., g.r. 2*l.* 13s., y.r. 149*l.* 6s. 630

DAVID BURNETT & CO.
Pulham St. Mary Magdalen, Norfolk. — "Semere Green Farm," 18 a. 3 r. 27 p., f., y.r. 22*l.* 10s. 460

CHAMPION & BUSBY.
Leytonstone.—11, Beulah-rd., f., w.r. 22*l.* 2s.. 215

EDWIN EVANS.
Kingston Hill, Surrey.—"Sussex Lodge." f.g.r. 20*l.*, reversion in 44½ yrs. 760
Mortlake. — Sheen-la., f.g.r. 25*l.*, reversion in 39½ yrs. 900
Putney.—Charlwood-rd., f.g. rents 73*l.* 10s., reversions in 46 to 51½ yrs. 2,279
Charlwood-rd., f.g. rents 26*l.* 3s. 4d., reversions in 17½ and 19½ yrs. 1,370
Stepney.—Whitehorse-st., etc., f.g.r. 14*l.* 14s., reversion in 53 yrs. 440
Fulham.—Cassidy-rd., f.g. rents 47*l.* 5s., reversion in 83½ yrs. 1,080
Ealing.—Lavington-rd., etc., f.g. rents 139*l.* 13s., reversion in 97 yrs. 3,550
Norwood.—2 and 6, St. Mary's-rd., u.t. 59 yrs., g.r. 15*l.*, y.r. 70*l.* 240
Hanwell.—3, 4, and 5, Evelyn-ter., u.t. 99 yrs., g.r. 15*l.* 15s., y.r. 88*l.* 600
Canning Town.—105 to 115 (odd), Bidder-st., and 1, Randall-st., u.t. 82 yrs., g.r. 38*l.* 10s., w.r. 159*l.* 18s. 850
Holloway.—7, 9, 11 to 17, Brand-st., and 1 to 6, Brand-ct., u.t. 41½ yrs., g.r. 70*l.*, w.r. 172*l.* 8s. 100
Deptford.—56 to 66 (even), 69, 71, and 73, Alvar-st., u.t. 47½ yrs., g.r. 43*l.* 7s., w.r. 152*l.* 2s. 100
1 to 5, Dugald-st., and 1 to 6, Hamar-pl., u.t. 47½ yrs., g.r. 52*l.*, w.r. 185*l.* 18s. 110

By FRASER & HEIGH.
Holloway.—6, 12, 18, 20, 22, 24, and 28, Fulbrook-rd., u.t. 52 yrs., g.r. 31*l.* 2s., y.r. 294*l.* 3,205
25, 27, 31, and 33, Langdon-rd., f., y.r. 144*l.* 2.035

By W. HALLETT & CO.
Maida Hill.—13, Blomfield-rd., u.t. 34 yrs., g.r. 14*l.*, y.r. 120*l.* 1,350
Acton.—20, Alfred-rd., u.t. 72½ yrs., g.r. 9*l.*, p. 500

By HARDING & SON.
Chelsea.—2 and 4, Park-walk (s.), u.t. 43 yrs., g.r. 16*l.*, y.r. 120*l.* 1,450
Fulham.—4, Rectory-rd. (s.), u.t. 33½ yrs., g.r. nil, w.r. 20*l.* 16s. 250

By E. H. HENRY.
Clapham.—16, Crescent-gr., also stabling in rear, f., y.r. 95*l.* 1,000
11, Grove-rd., f., y.r. 80*l.* 1,200
24, Victoria-rd., f., y.r. 50*l.* 700
31 and 55, Leppoc-rd., u.t. 76 yrs., g.r. 13*l.* 6s., y.r. 80*l.* 850

By J. HIBBARD & SONS.
Bethnal Green.—90 to 100 (even), Cheshire-st., 53 to 71 (odd), Seabright-st., w.r. 560*l.*; also i.g. rents 310*l.*, u.t. 14 yrs., g.r. 93*l.* 2,800

By E. & H. LUMLEY.
Fulham.—1 and 2, Brind-ter., f., w.r. 35*l.* 2s. 285
Canning Town.—30 and 32, Nelson-st., f., w.r. 41*l.* 12s. 255
2, Emily-st., f., w.r. 18*l.* 4s. 118
35 to 41 (odd), Wightman-st., f., w.r. 109*l.* 4s. 595
East Ham.—1 to 9 (odd), Poulett-rd., u.t. 94½ yrs., g.r. 21*l.*, w.r. 127*l.* 620
Canning Town.—5 to 8, St. John's-rd., u.t. 79 yrs., g.r. 16*l.* 16s., w.r. 92*l.* 6s. 100

By NORFOLK & PRIOR.
Catford.—Ravensbourne Park, "Old House" and 2 a. 1 r. 5 p., f., p. 1,400

By FRANKLIN & JONES (at Thame).
Shabbington, Bucks.—A freehold estate, 58 a. 2 r. 12 p. 2,800

June 15.—By H. DONALDSON & SONS.
Hoxton.—8, Cropley-st. (s.), u.t. 38 yrs., g.r. 3*l.* 15s., y.r. 30*l.* 240
Dalston.—102, Richmond-rd., u.t. 19 yrs., g.r. 6*l.*, e.r. 36*l.* 180
23, Montague-rd., u.t. 56 yrs., g.r. 6*l.*, y.r. 34*l.* 315
87, Greenwood-rd., u.t. 48 yrs., g.r. 7*l.*, y.r. 42*l.* 350
Kingsland.—7, Ridley-rd., u.t. 52 yrs., g.r. 6*l.*, e.r. 45*l.* 385

By FOSTER & CRANFIELD.
Islington.—17, Popham-rd. (s.), f., y.r. 28*l.* .. 390
Holloway.—72, Drayton-pk., u.t. 71½ yrs., g.r. 8*l.*, y.r. 47*l.* 450

By W. T. MARSH.
West Kensington.—Beaumont-rd., f.g. rents 80*l.*, reversion in 74 and 77 yrs. 2,000
Notting Hill.—Appleford-rd., f.g. rents 49*l.* 10s., reversion in 62½ yrs. 1,130
Clapham.—Klea-av., f.g. rents 47*l.* 5s., reversion in 80 yrs. 1,141

By MARTIN, WHITE, & CO.
Dulwich.—12, Tarbert-rd., u.t. 76 yrs., g.r. 6*l.* 6s., y.r. 34*l.* 320
14, East Dulwich-gr., u.t. 79½ yrs., g.r. 6*l.* 10s., y.r. 32*l.* 315

By H. MUSKETT & CO.
Enfield Highway, Middx.—1 to 8, Market-parade, f., y.r. 425*l.* (in lots) 6,040
Clapton.—189, Brooke-rd., u.t. 71 yrs., g.r. 7*l.*, y.r. 38*l.* 455
Edmonton.—23 to 31 (odd), Millbrook-rd., u.t. 89 yrs., g.r. 20*l.*, w.r. 117*l.* 460

By NOTLEY & CO.
Soho.—13 and 15, Wardour-st. (s.), area 2,220 ft., f., e.r. and y.r. 600*l.* 1,150

By DOUGLAS YOUNG & CO.
Clapham.—30, Lynette-av., u.t. 80½ yrs., g.r. 7*l.* 10s., y.r. 40*l.* 450
5 and 7, Klea-av., u.t. 80½ yrs., g.r. 13*l.* 10s., y.r. 76*l.* 820

By TOPLIS & HARDING.
Chalk Park.—25 and 27, Belmont-st., u.t. 59 yrs., g.r. 12*l.* 12s., y.r. 78*l.* £590
Holloway.—19, Anatola-rd., u.t. 64½ yrs., g.r. 6*l.*, w.r. 33*l.* 16s. 190
Kentish Town.—29a, Herbert-st. (yard and stabling), u.t. 61½ yrs., g.r. 3s., y.r. 26*l.* 370

June 16.—CARTWRIGHT & ETCHES.
Wimbledon.—35, South Park-rd., f., e.r. 60*l.* 400

DRYSDALE, NURSE, & CO.
Stoke Newington.—40, Leswin-rd., u.t. 79 yrs., g.r. 6*l.*, w.r. 44*l.* 4s. 355
Kingsland.—Glebe-rd., warehouse premises, u.t. 33 yrs., g.r. 12*l.*, e.r. 50*l.* 250

FURBERS'.
Loudwater, Bucks.—"Riversleigh" and 1 a. 1 r. 5 p., f., p. 1,250

E. W. HARRIS.
Beckenham.—Arthur-rd., four freehold building plots 170
Sydenham.—41, Kent House-rd., u.t. 59 yrs., g.r. 8*l.*, e.r. 35*l.* 155

C. C. & T. MOORE.
Mile End.—232, 234, and 236, Devonshire-st., u.t. 6½ and 19½ yrs., g.r. 19*l.*, w.r. 126*l.* 2s. 290
62, 65, and 66, Longfellow-rd., u.t. 56 yrs., g.r. 10*l.* 10s., w.r. 92*l.* 6s. 500
Hackney.—50, Devonshire-rd., u.t. 62 yrs., g.r. 5*l.* 10s., e.r. 40*l.* 250
Upton Park. — 23, Claughton-rd., f., y.r. 24*l.* 14s. 210
Leytonstone.—12 to 22 (even), Harvey-rd., f., w.r. 158*l.* 12s. 1,445
Carlton-rd., etc., f.g.r. 46*l.*, reversion in 97 yrs. 1,060
Woodford.—Eastwood-rd., f.g. rents 27*l.*, reversion in 97 yrs. 625
Poplar.—2, 3, 4, 5, and 6, Morris-rd., f., w.r. 140*l.* 8s. 1,450
Stepney.—62, 64, 68 to 74 (even), Ben Jonson-rd., and 1, Taylor's-pl., u.t. 18½ yrs., g.r. 20*l.*, y.r. 223*l.* 12s. 600
4, Monteagle-st., u.t. 79 yrs., g.r. 4*l.* 4s., w.r. 27*l.* 6s. 275

By NEWBON, EDWARDS, & SHEPHARD.
Hampstead.—29, Cotleigh-rd., u.t. 82½ yrs., g.r. 8*l.*, e.r. 45*l.* 380
Canonbury.—25, Canonbury-rd., u.t. 14½ yrs. g.r. 5*l.*, e.r. 40*l.* 200
Finsbury Park.—54, Queen's-rd., u.t. 71½ yrs., g.r. 9*l.* 9s., e.r. 65*l.* 695
Stoke Newington.—132, Osbaldeston-rd., u.t. 83½ yrs., g.r. 6*l.*, e.r. 55*l.* 565
Homerton.—34, 36, 42, and 44, Templar-rd., f., w.r. 93*l.* 12s. 265
Hackney.—193, Well-st. (s.), f., y.r. 18*l.* 360
Tottenham.—Broad-la., f.g.r. 5*l.*, reversion in 82 yrs. 130

By WM. STEVENS.
Dalston.—13 to 19 (odd), Ivydene-rd., u.t. 78½ yrs., g.r. 24*l.*, w.r. 171*l.* 12s. 1,350
33 to 39 (odd), Trederwen-rd., u.t. 78½ yrs., g.r. 20*l.*, w.r. 172*l.* 18s. 1,160
28, 30, 34, 36, and 38, Trederwen-rd., u.t. 80½ yrs., g.r. 25*l.*, w.r. 214*l.* 10s. 1,330
Hackney.—158 and 160, Lansdowne-rd., u.t. 78½ yrs., g.r. 15*l.*, y.r. 112*l.* 14s. 970
166, Lansdowne-rd. (s.), u.t. 78½ yrs., g.r. 1*l.*, w.r. 26*l.* 180
Dalston.—32 and 34, Lenthal-rd., u.t. 16 yrs., g.r. 2*l.*, y.r. 60*l.* 310
Stoke Newington.—31 and 33, Farleigh-rd., u.t. 60 yrs., g.r. 12*l.*, y.r. 78*l.* 900
De Beauvoir Town.—40, Culford-rd., u.t. 27½ yrs., g.r. 4*l.* 7s. 6d., y.r. 30*l.* 260
215, Southgate-rd., u.t. 25 yrs., g.r. 6*l.* 10s., p. 380
Stamford Hill.—2, Nassau-rd., u.t. 70 yrs., g.r. 8*l.*, y.r. 40*l.* 400
Holloway.—41, Corinne-rd., u.t. 64 yrs., g.r. 6*l.*, y.r. 36*l.* 400

By STIMSON & SONS.
Balham.—97, 103 to 109 (odd), Bedford-hill, u.t. 61 yrs., g.r. 50*l.*, y.r. 229*l.* 1,525
Bermondsey.—13 to 25 (odd), Cranham-rd., u.t. 51 yrs., g.r. 13*l.*, w.r. 240*l.* 10s. 1,830
80 to 86 (even), Rolls-rd., w.r. 135*l.* 4s.; also i.g.r. 9*l.*, u.t. 29½ yrs., g.r. 15*l.* 900
Old Kent-road.—5, Bowles-rd., u.t. 38 yrs., g.r. 4*l.*, w.r. 32*l.* 10s. 180
10 to 28 (even), Malt-st., u.t. 34½ yrs., g.r. 1s., w.r. 293*l.* 16s. 2,320
Peckham.—3, 5, 7, and 9, Hill-st., u.t. 37½ yrs., g.r. 18*l.*, w.r. 130*l.* 880
21, Studholme-st., u.t. 70½ yrs., g.r. 5*l.* 5s., y.r. 30*l.* 330
77 and 79, Naylor-rd., u.t. 70½ yrs., g.r. 10*l.* 10s., w.r. 75*l.* 8s. 630
Battersea.—22 to 28 (even), Wayford-st., u.t. 71½ yrs., g.r. 20*l.*, w.r. 156*l.* 900
Croydon.—32, Westbury-rd., u.t. 65 yrs., g.r. 4*l.* 15s., e.r. 30*l.* 315

By G. TROLLOPE & SONS.
South Kensington.—101, Onslow-sq., u.t. 33½ yrs., g.r. 2*l.*, p. 2,920

By G. B. HILLIARD & SON (at Rochford).
Great Stambridge, Essex.—"Steward's Elm Farm," 139 a. 2 r. 23 p., f., y.r. 120*l.* .. 1,900
Freehold messuage, shop and bakehouse, y.r. 19*l.* 300

June 17.—ARMY & NAVY AUXILIARY.
Paddington.—Lancefield-st., f.g. rents 59*l.* 10s., reversion in 72 and 73 yrs. 1,450
Lingfield, Surrey.—Dorman's Park, "South View," f., p. 400

By BISLEY & SONS.
Rotherhithe.—74 and 76, Rotherhithe New-rd., u.t. 48½ yrs., g.r. 5*l.*, w.r. 62*l.* 8s. .. 500
115 and 117, Rotherhithe New-rd., u.t. 59 yrs., g.r. 5*l.* 5s., w.r. 62*l.* 8s. 500
106, 108, and 110, Neptune-st., f., w.r. 58*l.* 10s. 525

COOPER & GOULDING.
Bow.—17 and 19, British-st., f., y.r. 67*l.* 1,070
Tottenham.—76, 78, and 80, Birkbeck-rd., f., w.r. 81*l.* 18s. 845
Maida Vale.—38, Sutherland-av., u.t. 59 yrs., g.r. 10*l.*, y.r. 70*l.* 420
Holloway.—1, 3, 5, 7, 9, 10, and 16, Foxham-rd., u.t. 70½ yrs., g.r. 47*l.*, y.r. 320*l.* 3,060

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CRONES'.

Brockley.—5 and 7, Carlton-rd., u.t. 68½ yrs., g.r. 16*l.*, y.r. 100*l.* £1,000
Sevenoaks, Kent. — Granville-rd., "Rock-lands," f., p. 1,250
Knockholt, Kent.—"Burlings" and 8 a. 1 r. 14 p., f., y.r. 33*l.* 760
"Highfield" and plot of land adjoining, 2 a. 3 r. 30 p., f., y.r. 45*l.* 850
"Sunny Bank," f., y.r. 22*l.* 410
"Holly Cottage," with farmery, 3 a. 3 r. 31 p., f., y.r. 40*l.* 820
Shelley's-la., two freehold cottages, w.r. 14*l.* 155

G. L. LUCK.

Crouch End.—9, Christ Church-rd., u.t. 72 yrs., g.r. 10*l.*, p. 900

LINNETT & LANE.

Willesden.—64 and 66, Barry-rd., f., w.r. 49*l.* 8*s.* 600
56, Barry-rd. (with laundry), f., y.r. 45*l.* .. 525
Harlesden.—29, 35 and 37, Minet-av., u.t. 82½ yrs., g.r. 19*l.* 10*s.*, y.r. 114*l.* 1,075

PROTHEROE & MORRIS.

Orsett, Essex.—Part of Gammon Staples Farm, 5 a. 1 r. 35 p., c. 130
Two freehold enclosures of land, 11 a. 2 r. 35 p. 785
Bexhill-on-Sea, Sussex. — Little Common, "Popp's Farm," 22½ acres, f., p. 4,770
North Hayling, Hants.—The Langston Fishery, part f. and c., and part u.t. 60½ yrs., g.r. 101*l.*, p. (with plant, fixtures, etc.) 1,000

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

SATURDAY, JUNE 25.

Edinburgh Architectural Association.—Annual Excursion, to (1) Glamis Castle, (2) Restenneth Priory.

Junior Institution of Engineers.—Visit to the Chelsea Generating Station of the Underground Electric Railways Company of London, Lot's-road, Chelsea. 3 p.m.

MONDAY, JUNE 27.

Builders' Benevolent Institution.—Monthly Committee Meeting. 5 p.m.

TUESDAY, JUNE 28.

London Master Builders' Association.—Plumbers' Conciliation Board. 3 p.m.

Dundee Institute of Architecture.—Annual General Meeting.

SATURDAY, JULY 2.

Northern Architectural Association.—Annual Excursion: Naworth, Lanercost, and Carlisle.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and Quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks.	1 16 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks ...	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 10 0	" at railway depôt
Red Wire Cuts ...	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire ...	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks.....	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats.....	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers...	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints.	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats.....	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers...	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints,	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.
	s. d.	
Thames and Pit Sand.....	7 3	per yard, delivered.
Thames Ballast.....	6 0	" "

BRICKS, &c.—(*continued*).

	s. d.	
Best Portland Cement	30 0	per ton, delivered.
Best Ground Blue Lias Lime	21 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2 2½	" "
	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks...	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality*

	s. d.	
Scappled random blocks	2 10	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube, "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides Ditto	3 0	" "
3 in. sawn two sides (slabs random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "

Hopton Wood (Hard Bed)	in blocks 2 3	per ft. cube.
" " "	6 in. sawn both sides landings 2 7	deld. rly. depôt per ft. super. deld. rly. depôt
" " "	3 in. do. 1 2½	" "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 first quality "	13 0 0	" "
20 × 12 " " "	13 15 0	" "
16 × 8 " " "	7 5 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 " "	6 12 6	" "
20 × 10 best Eureka unfading green .	15 17 6	" "
20 × 12 " "	18 7 6	" "
18 × 10 " "	13 5 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 12 6	" "
18 × 10 " "	9 12 6	" "
16 × 8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles .	42 0	per 1000 at rly. depôt.
Hip and Valley tiles ...	3 7	per doz. " "
Best Brosely tiles.....	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " "
Hip and Valley tiles ...	4 0	per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Stafford shire do. (Peakes).....	51 9	per 1000 " "
Do. Ornamental do.....	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles.....	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced.	50 0	per 1 00 " "
Do. pressed.....	47 6	" " "
Do. Ornamental do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4.....	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in....	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in....	8 10 0	9 10 0
Foreign Sawn Boards—		
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.) ...	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

WOOD.—(*continued*).

	At per standard. £ s. d.	£ s. d.
JOINERS' WOOD.		
White Sea: first yellow deals, 3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.....	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.....	21 0 0	22 10 0
Do. 3 in. by 9 in.....	18 0 0	19 10 0
Battens.....	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.....	14 10 0	16 0 0
Battens.....	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.....	13 10 0	14 0 0
Do. 3 in. by 9 in.....	13 0 0	14 0 0
Battens.....	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens.....	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals.....	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	35 0 0	upwards.
Oddments	24 0 0	26 0 0
Seconds, regular sizes.....	26 10 0	28 10 0
Yellow Pine oddments	22 0 0	24 0 0
Kauri Pine—Planks, per ft. cube .	0 3 6	0 5 0
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch ...	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks— per ft. cube.....	0 4 0	—

Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ...	7 5 0
Compound Girders, ordinary sections	8 2 6 ...	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ...	8 17 6
Flitch Plates	8 5 0 ...	8 15 0
Cast Iron Columns and Stanchions including ordinary patterns...	7 2 6 ...	8 5 6

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 5 0 ...	7 15 0
Staffordshire Crown Bars, good merchant quality.....	7 15 0 ...	8 5 0
Staffordshire "Marked Bars"	10 0 0 ...	—
Mild Steel Bars.....	8 15 0 ...	9 5 0
Hoop Iron, basis price	9 5 0 ...	9 10 0
" " Galvanized	17 10 0 ...	—
("And upwards, according to size and gauge.)		
Sheet Iron (Black)—		
Ordinary sizes to 20 g.	9 15 0 ...	—
" " 24 g.	10 15 0 ...	—
" " 26 g.	12 5 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.....	12 15 0 ...	—
Ordinary sizes to 22 g. and 24 g.	13 5 0 ...	—
" " 26 g.	14 5 0 ...	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	16 0 0 ...	—
" " 22 g. and 24 g.	16 10 0 ...	—
" " 26 g.	18 0 0 ...	—
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 10 0 ...	—
" " 22 g. and 24 g.	13 0 0 ...	—
" " 26 g.	13 15 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 15 0 ...	—
" " 26 g.....	14 0 0 ...	—
Cut nails, 3 in. to 6 in.....	9 0 0 ...	9 10 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	14 5 ...	—
Pipe in coils	14 15 ...	—
Soil pipe	17 5 0 ...	—
Compo pipe...	17 5 0 ...	—

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LEAD, &c.—(*continued*).

	Per ton, in London. £ s. d.
ZINC—Sheet—	
Vieille Montagne ....ton	27 0 0 ... —
Silesian....	26 15 0 ... —
COPPER—	
Strong Sheet....per lb.	0 0 10½ ... —
Thin ,, ... ,,	0 0 11½ ... —
Copper nails .... ,,	0 0 11 ... —
BRASS—	
Strong Sheet.... ,,	0 0 10 ... —
Thin ,, ... ,,	0 0 11 ... —
TIN—English Ingots .... ,,	0 1 3½ ... —
SOLDER—Plumbers' .... ,,	0 0 6½ ... —
Tinmen's.... ,,	0 0 8 ... —
Blowpipe.... ,,	0 0 9 ... —

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths....	1¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths....	2¼d. ,, ,,
26 oz. thirds	4d. ,, ,,
,, fourths....	3¼d. ,, ,,
32 oz. thirds	5d. ,, ,,
,, fourths....	4¼d. ,, ,,
Fluted Sheet, 15 oz....	3d. ,, ,,
,, 21 oz....	4d. ,, ,,
¼ Hartley's Rolled Plate	1¾d. ,, ,,
⅜ ,, ,, ,, ...	1¾d. ,, ,,
½ ,, ,, ,, ...	2¾d. ,, ,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes.... per gallon	0 1 5½
,, ,, ,, in barrels .... ,,	0 1 6½
,, ,, ,, in drums .... ,,	0 1 9
Boiled ,, ,, in pipes .... ,,	0 1 8
,, ,, ,, in barrels .... ,,	0 1 9
,, ,, ,, in drums .... ,,	0 2 0
Turpentine, in barrels .... ,,	0 3 6
,, in drums .... ,,	0 3 8
Genuine Ground English White Lead per ton	18 15 0
Red Lead, Dry.... ,,	18 10 0
est Linseed Oil Putty .... per cwt.	0 6 6
Stockholm Tar.... per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak....	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage....	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan....	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

PUBLISHER'S NOTICES.

Nat. Tel., 6112, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXV. (July to December, 1903) was given as a supplement with issue of January 9 last.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each.

THE EIGHTY-FIFTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

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PREPAYMENT IS ABSOLUTELY NECESSARY.

. Stamps *must not* be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine Street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE noon on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS advertising in "THE BUILDER" may have *Replies addressed to the Office*, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BARNET.—For new post office, for H.M. Office of Works :—

		Credit old materials.
Thompson & Co.	£5,037 0 0 ..	£25 0 0
Webster & Cannon ..	4,628 0 0 ..	52 10 0
C. Miskin & Sons....	4,360 0 0 ..	12 0 0
General Builders, Ltd.	4,299 0 0 ..	25 0 0
J. Stewart....	4,219 0 0 ..	25 0 0
S. Worboys	4,218 0 0 ..	33 0 0
Mallock & Parsons ..	4,199 0 0 ..	30 0 0
Oak Building Co. Ltd.	4,195 0 0 ..	60 0 0
A. E. Townsend	4,174 0 0 ..	26 0 0
Hockley & Co....	4,048 0 0 ..	48 0 0
W. H. Hinkins....	4,040 0 0 ..	29 10 0
Shrouder & Matthews	3,986 2 0 ..	25 0 0
W. H. Lorden & Son.	3,919 0 0 ..	25 0 0
F. G. Minter....	3,890 0 0 ..	—
C. Ansell	3,800 0 0 ..	50 0 0
W. H. Sharpe	3,775 0 0 ..	55 10 0
Foster Bros....	3,737 0 0 ..	42 0 0
G. Wiggs	3,724 0 0 ..	51 0 0
J. Shelbourne & Co...	3,712 0 0 ..	46 0 0
Rowley Bros.	3,650 0 0 ..	21 0 0
A. W. Nash	3,648 0 0 ..	55 0 0
P. Banyard	3,592 10 0 ..	57 10 0
F. & A. Willmott ..	3,411 0 0 ..	30 0 0

BECKENHAM.—For the erection of new works, for Mr. H. Turney, at Clock House Beckenham. Mr. C. J. Kohler, architect, 56, Cheapside, E.C. :—

T. Watt	£4,800 0 0	F. W. Green	£3,712 0 0
T. Inkpen ..	4,150 0 0	W. Douns & Co.	3,655 0 0
Syme & Duncan	3,988 0 0	T. W. Jones	3,533 0 0
T. Inge	3,863 15 0	W. J. Norris	3,474 0 0
W. Holt	3,800 0 0	T. G. Nicolls & Son* ..	3,346 8 6
Colley & Sons	3,785 0 0		
W. Renuick ..	3,742 0 0		

BRENTFORD.—For construction of an underground public convenience, Kew Bridge, for the Urban District Council. Mr. Nowell Parr, Engineer and Surveyor, Clifden House, Boston-road, Brentford :—

Doulton & Co...	£4,106 0	Wisdom Bros.	£3,700 0
W. J. Renshaw	3,979 0	Chambers Bros.	3,685 10
Finch & Co. ..	3,977 0	A. & B. Hanson	3,681 0
Jennings, Ltd...	3,953 0	B. E. Nightingale	3,659 0
J. W. Brooking	3,897 0	E. Wall	3,630 0
G. H. Gibson ..	3,859 0	W. J. Dickens	3,590 0
Soole & Sons ..	3,800 0	Dorey & Co., Brentford* ..	3,498 0
Perry Bros....	3,777 0		
A. C. Heywood	3,752 0		
F. & H. F. Higgs	3,725 0		

BRENTFORD.—For extension of wholesale produce market, Kew Bridge, for the Urban District Council. Mr. Nowell Parr, engineer and surveyor, Clifden House, Boston-road, Brentford :—

H. M. Patrick...	£50,129	Mowlem & Co. ..	£46,823
J. W. Brooking ..	49,846	B. E. Nightingale	46,815
Messom & Sons ..	49,111	Soole & Sons	45,970
F. & H. F. Higgs ..	48,975	Wisdom Bros.....	44,675
Perry Bros.	47,549	G. H. Gibson	44,269
W. J. Dickens ..	47,530	W. Wallis.....	44,000
Perry & Co.....	47,490	E. Wall	43,633
A. & B. Hanson..	47,182	Dorey & Co., Brentford*	43,302
Pethick Bros.	47,166		

BRYNMAWR.—For alterations and renovation of Rehoboth Congregational Church. Messrs. Habershon & Fawckner, architects, 41, High-street, Newport :—

S. T. Davies & Sons	£1,534	J. Jenkins, Brynmawr*	£1,197
T. S. Foster	1,380	W. Jewell & Sons	1,195
J. Morgan.....	1,325	D. W. Richards ..	1,193
O. S. Morgan & Co.	1,250	C. Shopland	1,188

CARDIFF.—For reconstructing No. 162, Bute-street, for Mr. M. Del Guerra. Mr. D. C. Salmond, architect, 15, Queen-street, Cardiff :—

G. Hallett	£1,603 0	F. Couzens & Son	£1,290 0
J. H. Venning	1,423 0	F. Small, Cardiff*	1,250 0
C. Totterdell ..	1,387 16		
G. H. Elkington	1,304 0		

* CARLISLE. — For Cumwhinton reservoir, filters, mains, etc. (Contract No. 1), for the Corporation. Messrs. James Mansergh & Sons, engineers, 5, Victoria-street, Westminster, S.W. :—

Morrison & Mason, Ltd.	£176,089 16 8
W. Scott & Middleton	163,688 8 5
T. Cook Starkey	158,903 3 10
J. Best	142,631 6 6
J. Aird & Sons.....	134,632 15 8
W. Kennedy, Ltd., Partick*..	120,377 19 3
Bushby & Sons	119,136 15 3
R. C. Brebner & Co.	114,562 4 3
G. Mackay & Sons	97,991 15 6

DRIFFIELD.—For alterations to premises, No. 64, Market-place, for Messrs Tate & Durrans. Mr. J. Shepherdson, architect, 15, Manor-street, Bridlington :—

A. A. Booth ..	£438 0 0	C. W. Dry	£314 12 0
J. Dunn	425 0 0	H. Naylor, Driffield*.....	298 0 0
A. Leason	362 0 0		
W. Leason & Son	339 0 0		

EAST STONEHOUSE (Devon).—For stoneware pipe sewers, Peel-street, and part of Brownlow-street, for the Urban District Council. Mr. F. A. Wiblin, surveyor, Town Hall, East Stonehouse :—

R. T. Hortop & Co., Plymouth, Devon*.. £235 6 0

EAST PECKHAM.—For reconstructing three Bran bridges, etc., for the Kent County Council. Mr. F. W Ruck, County Architect, Maidstone :—

Thomas & Edge	£13 850 0 0
A. Fasey & Sons	13,621 1 9
T. Elmore & Son.....	13,491 0 0
Wallis & Sons, Ltd.	13,443 0 0
A. E. Nunn	13,171 0 0
Jarvis & Son	12,488 0 0
F. Miskin, Ltd., Rochester*	11,988 18 0

ERITH.—For additions and alterations to the electr light station (Contract No. 6), for the Urban Distr Council. Quantities by Mr. W. Egerton, 12, Queen road, Erith :—

F. Spencer & Son	£2,780 0	Thomas & Edge	£2,303
J. T. Jarvis & Son	2,665 15	G. H. Gunning & Sons.....	2,273 1
F. G. Minter ..	2,424 0	Foster Bros. ..	2,256 0
J. Shelbourne & Co.	2,376 0	Friday & Ling, 15, The Nursery, Erith*	2,200 0
Ennes Bros. ..	2,362 0	T. G. Sharpington	2,198 0
B. E. Nightingale	2,337 0		

ERITH.—For steel road bridge with brick and concrete abutments, at Lower-road level crossing, for the Urban District Council. Messrs. Hawtayne & Zeden, engineers, 9, Queen-street-place, London, E.C. :—

Heenan & Froude, Ltd.	£14,392 15 6
A. Thorne	12,270 8 0
Motherwell Bridge Co., Ltd. ..	11,154 1 3
Lambert & Edwards	11,110 12 7
G. Wimpey & Co.....	10,883 16 2
J. B. Squire & Co.	10,555 13 0
J. Shelbourne & Co.....	10,134 0 0
Friday & Ling	10,091 19 10
Muirhead, Greig, & Matthews..	9,963 8 10
J. G. White & Co., Ltd.....	9,927 3 10
G. H. Gunning & Sons	9,800 0 0
E. C. & J. Keay, Ltd.....	9,737 1 7
A. Dixon & Co.....	9,731 4 4
G. Bell	9,697 0 0
W. Kennedy	9,647 15 1
Enness Bros.....	9,620 0 0
J. A. Ewart	9,423 7 3
E. Wood & Co.....	9,315 9 0
A. Fasey & Co.....	9,032 8 10
Mayoh & Haley.....	8,825 8 4
Wilkinson Bros.	8,686 0 0
W. Pattinson & Sons, 50, Parliament-street, S.W.*	8,329 0 0

EXETER.—For erecting new infirmary and alterations to existing infirmary at City Workhouse, for the Guardians. Mr. R. M. Challice, architect, 14, Bedford-circus, Exeter :—

R. Wilkins & Sons	£14,489	W. Brealy	£10,899
Dart & Pollard ..	13,300	G. Herbert	10,616
A. N. Coles.....	12,030	Westcott, Austin, & White	10,599
W. G. Coles.....	11,491	Ham & Passmore, Exeter*	10,514
W. E. Blake	11,330		
Stephens & Son, Ltd.	11,299		

FARNBOROUGH (Kent).—For the erection of a pair of cottages, for Mrs. Child. Mr. Money Marsland, architect, 68, Great Tower-street, E.C. :—

W. Owen* £500

FISHPONDS (Bristol).—For constructing a road and sewer (portion of Elmdale-road), for the Fishponds and Bedminster Brick and Tile Co., Ltd. Mr. W. Saunders, architect and surveyor, Rupert-chambers, Quay-street, Bristol. Quantities by the surveyor :—

Wilkins & Gosling, Ashley-road, Bristol* £225
[Lowest of eleven tenders.]

GILLINGHAM (Norfolk).—For outbuildings, infants room, and cloak-rooms, for the Managers of Gillingham Hall Non-Provided Schools. Mr. Arthur Pells, F.S.I., architect, Beccles :—

C. Kent	£410 0 0	A. D. Boddy & Son	£340 0 0
J. W. Frost ..	395 0 0	G. Johnson ..	309 3 9
C. C. Betts....	389 13 0	J. Gaze, Carlton Colville*	285 10 0
A. Hawes	352 18 6		
F. J. Allen	343 0 0		

HEADINGTON (Oxfordshire).—For main drainage works, Headington and Cowley, for the Headington Rural District Council. Mr. H. H. Humphreys, engineer, 28, Victoria-street, Westminster :—

Headington Parish.

G. Horber, Rutland-road, East Ham*.. £4,756 15 9

Cowley Parish.

J. H. Macdonald, Talgarth, Breconshire* £4,826 19 0

LEMINGTON.—For erecting new church, for the Methodist New Connexion. Mr. B. R. Irvin, architect, 58, Avenue-road, Gateshead. Quantities by architect :—

W. Hall	£1,321 4 2	Davison & Bolam	£1,237 19 6
T. Harver ..	1,264 7 10	J. Browell ..	1,236 9 3
H. Maughan	1,247 2 6	E. & A. Storey	1,180 0 7
P. Thirlwell & Son, Benwell - on - Tyne*	1,238 1 0	T. & J. White	1,133 8 8

[Without painting and glazing.]

LONDON.—For repaving works, New Tothill-street, Westminster, for the Westminster City Council :—

Limmer Asphalte Co.*	s. d.
2-in. asphalte on 6-in. concrete, per square yard	12 0
6 to 1 cement concrete, including excavation, per cubic yard	18 0
2-in. asphalte, hacking over and floating, with 2 to 1 p.c. concrete, 1 in. thick, to new levels	10 0

LONDON.—For repairs (cleaning, painting, etc.) at nineteen underground public conveniences in the City of Westminster, for the Westminster City Council :—

T. W. Haylock..	£305 0 0	S. & S. Dunn ..	£165 5 0
T. Coulthard....	208 2 0	Love & Co.* ..	158 0 0
J. R. Sims	186 7 0	J. D. Hobson§..	150 2 8

§ Tender informal.

TENDERS—*Continued on page* 705

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*Mortuary and Columbarium	Hampstead Borough Council	Not stated	Sept. 30
Library for Townhead	Glasgow Corporation	Not Stated	No date.
Library for Pollokshields	do.	Not Stated	do.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Machine Tools, Shafting, Gearing, etc.	Glasgow Corporation	Office of Public Works, 64, Cochrane-street, Glasgow	June 25
Engineers' Hand Tools and Furnishings for Workshops	do.	do.	do.
Six Houses, Kingswood-road, Prestwich	Co-operative & Industrial Soc., Ltd.	At Offices, Warwick-street, Prestwich	do.
Ayr District Asylum Hospital	Ayrshire County Council	J. B. Wilson, Architect, 92, Bath-street, Glasgow	do.
Scavenging Parish of Cockerton	Darlington R.D.C.	J. Robinson, Sanitary Inspector, Union Offices, Darlington	do.
Harehills United Meth. Free Church, Ashley-rd., Leeds	.....	H. Ascough Chapman, Arch., Prudential-buildings, Park-row, Leeds	do.
Public Conveniences, West Orchard	Coventry General Works Committee	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry	June 27
Urinals	do.	do.	do.
Telephonic Installation at Hospital, Aikin-street	Warrington Health Committee	F. V. L. Mathias, Borough Electrical Engineer, Howley, Warrington	do.
Additions, etc., Minshall Vernon National School	.....	J. Cawley, Architect, Central-chambers, Northwich	do.
Fireclay, Retorts, Bricks, etc.	Carlisle Gas Committee	W. J. Smith, Engineer, Gasworks, Carlisle	do.
Tiled Dadoes at Municipal Schools	Manchester Education Committee	Offices in Deansgate, Manchester	do.
Timber for Handicraft Centres	do.	do.	do.
Woodpaving, Goswell-road	Finsbury Borough Council	Borough Surveyor, Finsbury Town Hall, Rosebery-avenue, E.C.	do.
Concreting, Devonshire-street Council School	Salford Education Committee	H. E. Stelfox, A.R.I.B.A., 6, Princess-street, Manchester	do.
Direct Current Electricity Meters	Radcliffe U.D.C.	S. Mills, Clerk, Council Offices, Radcliffe, Lancs.	do.
Switchboards and Temporary Gear	Rochdale Corporation	Lacey, Sellar, & Leigh, Eng'rs., 2, Queen Anne's-gate, Westminster	do.
Electricity Cables	Edinburgh Corporation	Resident Electrical Engineer, 5, Dewar-place, Edinburgh	do.
Plant House, Victoria Park, Waterloo, Lancs.	Waterloo U.D.C.	F. Spencer Yates, Surveyor, Town Hall, Waterloo	do.
Cottage at Carlbury, Piercebridge	Rt. Hon. Lord Barnard	At the Office, Sawmills, Staindrop	do.
Renewing Slating, etc., at Workhouse	Canterbury Guardians	G. Smith, Architect, 34, Station-road West, Canterbury	do.
Street Works, Park-lane, Chadwell	Ilford U.D.C.	H. Shaw, Surveyor, Town Hall, Ilford	do.
Fencing, Goodmayer Recreation Ground	do.	do.	do.
Electric Light Wiring Installation	Stepney Borough Council	M. W. Jameson, Borough Engineer, 15, Great Alie-street, E.	June 28
Drain and Footpath, Brighton-road	Godalming Town Council	J. H. Norris, Borough Surveyor, Godalming	do.
Painter Work, George Heriot's School, etc.	George Heriot's Trust	Mr. Anderson, Superintendent of Works, 20, York-place, Edinburgh	do.
Painting, Paperhanging, etc., at Homes	Plymouth Incorporat'n of Guardians	W. Adams, Clerk, 13, Princess-square, Plymouth	do.
Private Improvement Works in Passages	Bootle Corporation	Borough Engineer's Office, Bootle	do.
Two "National" Independent Dome-top Boilers	Brighton Guardians	B. Burfield, Clerk, Parochial Offices, Brighton	do.
Paving with Soft Wood Part of Seven Sisters-road	Stoke Newington Borough Council	W. F. Loveday, Boro' Surv., Town Hall, Milton-rd., Stoke Newington	do.
Offices, Kington	Old Radnor Trading Co., Ltd.	C. Stuart Delfosse, Architect, Kington	do.
3,200 yds. of 18-in. Diameter Cast-Iron Pipes	Glasgow Corporation	A. Wilson, Gas Engineer, 45, John-street, Glasgow	do.
2,700 yds. of Trench Work, etc.	do.	do.	do.
Lead-Covered and Armoured Cables	St. Pancras Borough Council	Chief Clerk, Electricity Department Offices, 57, Pratt-street, N.W.	do.
Arc Lamp Carbons	do.	do.	do.
Technical and Secondary Schools	Chorley Corporation	Cheers & Smith, Architects, 24, Richmond-terrace, Blackburn	June 29
Painting Buildings at Sewage Works	Salford Corporation	Borough Engineer's Office, Town Hall, Salford	do.
Cast-Iron Pipes and Valves at Sewage Works	do.	do.	do.
Thirty-four Houses at Trelewis	Messrs. Lewis	T. Roderick, Architect, 50, Glebeland, Merthyr	do.
Three Houses at Glasnevin	St. Vincent de Paul Orphanage	Hague & McNamara, Architects, 50, Dawson-st., Dublin	do.
Reception House at Baird-street	Glasgow Corporation	A. B. M'Donald, City Engineer, 64, Cochrane-st., Glasgow	do.
Whinstone Boundary Walls, Hospital Site, Gateside	Greenock, etc., Hospital Committee	C. Macculloch, Town Clerk, Greenock	do.
Painting, etc., St. Michael's C'h, Ashton-under-Lyne	.....	T. J. Barlow, Hon. Sec., Athol House, Fraser-st., Ashton-und'r-Lyne	do.
Nine Water-Closets, etc., Giles-square, Richmond-road	Leeds Corporation	City Engineer's Office, Municipal-buildings, Leeds	do.
Stone Steps, Kerbing, Channelling	Blackpool Highways Committee	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
Painting, etc., Woolwich Infirmary, etc., Plumstead	Woolwich Guardians	The Steward's Office	do.
Making-up Oak-avenue, Enfield	Enfield U.D.C.	R. Collins, Surveyor, Public Offices, Enfield	do.
Making-up Part Alma-road, Ponders End	do.	do.	do.
Direct-current Motors	Manchester Electricity Committee	F. E. Hughes, Sec., Electricity Dept., Town Hall, Manchester	June 30
Motor Starters	do.	do.	do.
Low-pressure Cables	do.	do.	do.
Cable Troughing (Iron and Wood)	do.	do.	do.
Bitumen and Box Compound	do.	do.	do.
Valve Rods and Copper Wire Screens, Talla Scheme	Edinburgh & District Water Trustees	W. A. Tait, C.E., 72A, George-street, Edinburgh	do.
Steel Joists, and Collars, Talla Scheme	do.	do.	do.
Alnwickhill Filters Extension	do.	do.	do.
Repaving Manchester-road	Worsley U.D.C.	Surveyor, Public Offices, Hilton-lane, Walkden	do
Bank House, Ballyhannis, co. Mayo	Directors of Ulster Bank	W. H. Stephens & Son, Donegal-square North, Belfast	do.
Painting in Recreation Grounds	Withington U.D.C.	A. H. Mountain, Surveyor to Council, Town Hall, West Didsbury	do.
54 yds. of 18-in. Syphon under Chorlton Brook	do.	do.	do.
Street Works, Duke-street and Baguley-street	Droylsden U.D.C.	C. Hill, Surveyor, 10, Ashton-road, Droylsden	do.
Stoneware-pipe Sewer at Edenfield, etc.	Ramsbottom U.D.C.	J. Diggle & Son, Engineers, 14, Victoria-street, Westminster, S.W.	do.
Stores	Bomb., Baroda, & C. India Ry. Co.	T. W. Wood, Sec., Gloucester House, Bishopsgate-st. Without, E.C.	do.
5¼ miles c.c. Watermains	Fareham U.D.C.	W. Butler, Engineer, Council Offices, Quay-street, Fareham	do.
Cast-Iron Plates, etc., in Gangway to Condenser Bay	Manchester Electricity Committee	F. E. Hughes, Sec., Electricity Department, Town Hall, Manchester	do.
Silencer and Drain Work in Yard	do.	do.	do.
Gangways in Boiler House No. 2	do.	do.	do.
Stone Bridge at Brushford, over the Avon	Totnes R.D.C.	R. Tucker, Highway Surveyor, Hazard, Totnes	do.
Rebuilding Lumb Bridge, Fawfieldhead	Leek R.D.C.	Union Offices, Russell-street, Leek	do.
Steam Rolling	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes	July 1
Iron Fire-escape Staircases at Workhouse	Windsor Guardians	P. Lovegrove, Clerk, 3, Park-street, Windsor	do.
Hotel and Premises at Caerau, near Maesteg	.....	P. J. Thomas, Architect, Station-hill, Bridgend	do.
Dwelling-house, Crofts	.....	C. C. Doig, Architect, Elgin	do.
Churchyard Boundary Wall, Ainderby Steeple	.....	Churchwardens, Ainderby Steeple Vicarage, Northallerton	do.
Tramway Generating Plant (Two Contracts)	Exeter Corporation	H. D. Munro, City Electrical Engineer, Municipal Offices, Exeter	do.
Steam Dynamo	Rochdale Corporation	Lacey, Sellar, & Leigh, Eng'rs., 2, Queen Anne's-gate, Westminster	do.
Roof, Manorhamilton Parish Church	.....	J. Nixon, Hon. Sec., Sele't Yes., The Stores, Manorhamilton, Ireland	do.
Alterations, etc., Bible Chr'tian Chpl, High Bickington	.....	W. Gooding, High Bickington, Devon	do.
Alterations, etc., Six Cottages, Station-rd., Kenfig Hill	.....	Mason's Arms, Kenfig Hill, Wales	do.
*New Coastguard Buildings, Cliffe Creek, nr. Gravesend	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
*New Coastguard Buildings at Boscastle	do.	Superintending Civil Engineer H.M. Dockyard, Devonport	do.
*Supply of Materials, etc.	Ealing Town Council	Borough Surveyor, Town Hall, Ealing, W.	do.
400 tons of Cast-Iron Pipes	Glasgow Corporation	J. R. Sutherland, Engineer, Water Depart., 45, John-st., Glasgow	July 2
Cast-Iron Gas Condenser, etc., New Wortley Works	Leeds Gas Committee	R. H. Townsley, Manager, Gas Offices, East-parade, Leeds	do.
Altera., etc., Police Bdgs., Wath, Melmerby, nr. Ripon	N. Riding County Council	W. H. Brierley, County Architect, 13, Lendal, York	do.
Overhead Cranes, Lifting Tackle, etc.	The L.C.C.	County Hall, Spring-gardens, S.W.	do.
Pair of Police Cottages at Bognor	West Sussex County Council	W. McIntosh, County Surveyor, 22, Worthing-road, Horsham	do.
Additions to Elementary Schools at Middle Rasen	Lindsey County Council	Scorer & Gamble, Architects, Bank Street-chambers, Lincoln	do.
Additions to Elementary Schools, Ashby Puerorum	do.	do.	do.
Brick Abutments, Road Work, etc., Ford, Harlow	Essex County Council	P. J. Sheldon, Surveyor, Chelmsford	do.
Storage Reservoir, etc., Glenquey Burn	Dumfermline District Committee	W. R. Copland, C.E., Engineer, Glasgow	July 4
Main Conduit from Glendevon to Milesmark	do.	do.	do.
Main Conduit from Saline to Redcraigs	do.	do.	do.
2,500 to 3,000 tons of Purifying Lime	Sheffield United Gaslight Co.	H. Thomas, Manager, Commercial-street, Sheffield	do.
Alterations to Boundary Walls at Cemetery	Chester-le-Street Burial Joint Comt.	Superintendent's Office, Ropery-lane, Chester-le-Street	do.
Electricity Meters	Heston and Isleworth U.D.C.	J. and J. S. Enright, Engineers, 68, Lincoln's-inn-fields, W.C.	do.

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CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Painting, etc., Schools	Handsworth Education Committee	T. H. Moon, Sec., Education Offices, Soho Hill, Handsworth	July 4
Painting, Colouring, etc., Schools	Salford Corporation	Director of Education, Chapel street, Salford	do.
Flints	Arundel Town Council	E. F. Farrington, Borough Surveyor, Town Hall, Arundel	do.
Reading Room and Hall, Queenstown, Ireland	Young Men's Society	S. F. Hynes, Architect, 21, South Mall, Cork	do.
Residence, The Knoll, Shepley, Huddersfield	.....	E. W. Lockwood, Architect, Huddersfield	do.
Granite, Tar, Macadam, etc.	Waltham Holy Cross U.D.C.	W. Turner-Streather, Highbridge-street, Waltham Abbey	do.
Alterations, Painting, etc., No. 15, South-street	Dorchester Conservative Club	F. T. Maltby, Architect and Surveyor, Dorchester	do.
Reconstruction of 150 Railway Waggons	Glasgow Corporation	D. M'Coll, City-chambers, 64, Cochrane-street, Glasgow	do.
*Sewage Works, Painter's-lane, Enfield	Cheshunt U.D.C.	A. C. Lee, Clerk, Manor House, Cheshunt	do.
Repairs, Bloomfield Council School	Tipton U.D.C.	A. Long, Architect, 21, New-street, West Bromwich	July 5
High-speed Engine, Portrau Asylum, near Donabate	Richmond District Asylum	Asylum Offices, Grangegorman, Dublin	do.
Eskdalemuir Observatory Works (First Contract)	Commissioners of H.M. Works, etc.	W. T. Oldrieve, Architect, 3, Parliament-square, Edinburgh	do.
Free Library at Clitheroe	Clitheroe Corporation	S. Butterworth & Duncan, Architects, Rochdale	do.
2¼ miles of 9-in. Sewer, near Baldock	First Garden City, Ltd.	G. R. Strachan, Engineer, 7, Victoria-street, Westminster	do.
Two Oil or Gas Engines and Dynamo	Penrith U.D.C.	G. Wainwright, Clerk, Public Offices, Penrith, Cumberland	do.
Switchboard and Boosters	do.	do.	do.
Storage Battery	do.	do.	do.
Mains	do.	do.	do.
*Roadmaking Works	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham, N.	do.
*Erect'n of Covered Shelters, Infirmary, Brook-st., S.E.	Lambeth Guardians	Guardians' Offices, Brook-street, Kennington-road, S.E.	July 6
Street Improvement at Back-lane	Chiswick U.D.C.	J. Barclay, Surveyor, Town Hall, Chiswick	do.
Excavating Trenches, Laying Pipes, etc., Brook's-lane	do.	do.	do.
Painting, etc., at Schools	do.	do.	do.
Wall at Sewage Disposal Works	do.	do.	do.
Four Cast-Iron Hot-water Storage Tanks for Baths	Glasgow Corporation	Office of Public Works, 64, Cochrane-street, Glasgow	do.
*Artesian Well, East Dulwich	Camberwell Guardians	W. M. Binney, 53, Victoria-street, Westminster, S.W.	do.
Public Conveniences, Mitchell-street	Glasgow Corporation	Office of Public Works, 64, Cochrane-street, Glasgow	July 7
Stores, Gas Department	Salford Corporation	W. W. Woodward, Engineer, Bloom-street, Salford	do.
Hotel, etc., Argoed, Mon.	P. L. Lloyd	B. J. Francis, Architect, Abergavenny	do.
Additions, etc., to Glenburgie Distillery, Forres	.....	C. C. Doig, Architect, Elgin	do.
Organ Chamber and Vestry, St John's Ch., Ripon	.....	C. Hodgson Towler, F.S.A., Architect, The College, Durham	do.
1,000 tons of Granite Metalling	Newmarket U.D.C.	S. J. Ennion, Clerk, Deva-chambers, Newmarket	July 8
*Glazed Drain Pipes	County Borough of Brighton	Borough Engineer, Town Hall, Brighton	do.
*New Sorting Office, Winchmore Hill, N.	H.M. Works	H.M. Office of Works, Storey's-gate, Westminster, S.W.	do.
Painting and Decorating Council Schools	Ipswich Education Committee	E. T. Johns, Thoroughfare, Ipswich	July 9
Road Bridge of Two Spans at Howford, Nairn	Nairn County Council	P. M'Farlane Cram, C.E., Albert-street, Nairn	do.
Stones for Repair of Highways	Luton R.D.C.	B. B. Franklin, Surveyor, 21, Market-hill, Luton	do.
House and Shop at Blaenyffos	.....	T. Luke, Post Office, Blaenyffossy, R.S.O.	do.
Two Portable Electric Gantry Cranes, Queen's Quay	Belfast Harbour Commissioners	W. A. Currie, Secretary, Harbour Office, Belfast	July 11
Harbour Works, Invergordon	.....	G. Gordon & Co., Engineers, Inverness	do.
Underground Telephone Pipes, etc.	Manchester Corporation	City Surveyor's Office, Town Hall, Manchester	do.
Twenty Dust Vans and Twenty Slop Vans	Bethnal Green Borough Council	R. Voss, jun., Town Clerk, Church-row, Bethnal Green, E.	do.
9,700 yds. Cast-Iron Watermains	Newark R.D.C.	H. Walker & Son, Engineers, Albion-chamb., King-st., Nottingham	do.
Meter House	do.	do.	do.
Water-Tube Boilers	Handsworth U.D.C.	H. Ward, Clerk, Council House, Handsworth, Birmingham	do
Engines and Dynamos	do.	do.	do.
Overhead Hand Travelling Crane	do.	do.	do.
Storage Battery	do.	do.	do.
Arc Lamps and Posts	do.	do.	do.
Switchboard and Boosters	do.	do.	do.
*New School at Henshaw-street	Stretford Education Authority	E. Woodhouse, 88, Mosley-street, Manchester	do.
*Sewage Works, Greyhound-lane, Streatham	Wandsworth Borough Council	Surveyor's Offices, 215, Fulham High-road, S.W.	do.
*Foundation of New Road at Wood Green	The Company	Vigers & Co., 4, Frederick's-place, Old Jewry, E.C.	do.
Manilla Rope	Birkenhead Corporation	Manager's Office, Woodside Ferry, Birkenhead	July 12
Private Street Works, Rigby-road	Southampton Corporation	J. A. Crowther, Boro' Engineer, Municipal Offices, Southampton	do.
Fire Brigade Hose Carriage	Dundee Town Council	Firemaster, Central Station, Dundee	do.
*New Baths, etc., at Caterham Asylum	M.A.B.	Office of the Board, Embankment, E.C.	do.
*Porter's Lodge, Discharge Block, etc., Hos., Mortlake	Barnes U.D.C.	Council's Engineer, High-street, Mortlake	do.
Pumping Machinery (Contract No. 5)	Derby Corporation	J. Mansergh & Sons, Engineers, 5, Victoria-street, Westminster	July 13
800 yds. of Brick Culvert, 3 ft. 6 in. diameter	Newcastle-under-Lyme Corporation	Willcox & Raikes, Engineers, 63, Temple-row, Birmingham	do.
Screening Chamber, Pump Well, and Engine House	do.	do.	do.
Diversion of Lyme Brook and Roadway	do.	do.	do.
Bacteria Beds and Laying Out, etc., Irrigation Area	do.	do.	do.
*Making-up Paving & Sewering, Clancarty-rd., Sec. II.	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.	do.
*New Coastguard Buildings at Weybourne, Norfolk	Admiralty	Admiralty Office, 21, Northumberland-avenue, W.C.	July 15
Hydraulic Machinery, New Dock Works, Avonmouth	Bristol Docks Committee	W. W. Squire, Engineer, Cumberland-road, Bristol	July 25
Car Shed Buildings	Johannesburg Council	Mordey & Dawbarn, Engineers, 82, Victoria-street, Westminster	July 29
Bridge Over Railway at Twist-street	do.	do.	do.
*Improvements at Shire Hall	Essex County Council	F. Whitmore, Architect, Duke-street, Chelmsford	July 21
*Erection of a Police Station	do.	do.	do.
Five Houses at Murrell Hill	.....	Ryan & Co.'s, Devonshire-street, Carlisle	No date.
One House in Thirlwell-terrace	.....	do.	do.
Cemetery Lodge	Burtonwood Parish Council	Clerk's Office, White House, Burtonwood	do.
Paper Lead-Covered Cables	Newport County Borough	H. Collings Bishop, Town Hall, Newport	do.
Timber for Manual Instruction Centres	Birmingham Education Committee	Education Department, Edmund-street, Birmingham	do.
Pair of Steel Dock Gates, Hull Central Dry Dock	.....	G. K. Waghorn, Contractor's Office, Humber-street, Hull	do.
*Wood Paving Works	Paddington Borough Council	Borough Surveyor, Town Hall, Paddington, W.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Building Surveyor	Derbyshire Education Committee	Not Stated	June 30
*Quantity Surveyor	Acton U.D.C.	(See Advertisement this Issue)	July 4
*Assistant Civil Engineer	Civil Service Commissioners	Not Stated	July 7
*Architect	Heston & Isleworth U.D. Edn. Com.	300*l.* per annum	July 8

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xx.

TENDERS.—*Continued from page* 703.

LONDON.—For paving Warwick-place west mews, for the Westminster City Council. Total area about 280 yds. super.:—

	Per yd. super. s.	d.
French Asphalte Co.	11	6
Limmer Asphalte Paving Co.	12	0
London Asphalte Co.*	11	0
Trinided Lake Asphalte Co.	11	0

LONDON.—For new premises, Rochester-row, Westminster, for Messrs. W. Morris & Co. Mr. Arthur Keen, architect, 4, Raymond-buildings, Gray's-inn, W.C.:—

W. Johnson & Co.	£9,895	Patman & Fotheringham	£9,173
Martin, Wells, & Co.	9,873	J. Carmichael	9,160
J. Barker & Co.	9,650	Higgs & Hill	8,984
H. Roffey	9,568	Battley, Sons, & Holmes	8,847
J. Longley & Co.	9,549	Dove Bros.	8,585
Holliday & Greenwood	9,249	A. J. Bateman	8,534
Mattock Bros.	9,236		
F. G. Minter	9,179		

LONDON.—For roadworks, Coppett's-road, Muswell Hill, for the Town Council of Borough of Hornsey. Mr. E. J. Lovegrove, Borough Engineer and Surveyor, Municipal Offices, Southwood-lane, Highgate, N.:—

J. A. Dunnore	£5,646 1 9	T. Adams	£4,323 5 11
R. Ballard, Ltd.	4,975 16 0	Harvey, Bros., 25, Victoria-street, S.W.*	3,943 0 0
D. R. Paterson	4,812 0 0		
W. Griffiths & Co.	4,734 18 0		

LONDON.—For the construction of new river appliance for the London County Council:—

Pumps, Including Stop-Valve on Each Pump, and Monitors with Sluice Valves.

Shand, Mason & Co. 2,018
Merryweather & Sons, Ltd.* £1,640

Suction and Delivery Pipes, Steam and Exhaust Pipes, Valves, 'etc., as per Specification, including Fitting at Wyvenhoe of Pumps and Gear.

Merryweather & Sons, Ltd.	£752	Shand, Mason & Co.	£658
		Forrestt & Son, Ltd.*	600

LONDON.—For making-up carriageway of Woodlawn-road (Section III.), for the Fulham Borough Council. Mr. F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.:—

Roadway.

D. R. Paterson	£550 0 0	F. Fowles*	£480 0 0
J. Mears	502 0 0	E. Parry & Co.	480 0 0
H. J. Greenham	500 0 0	G. W. Wimpey & Co.	480 0 0
B. Nowell & Co.	493 0 0		

Footways.

Harvey Bros. (York stone)	£170 8 0
Harvey Bros. (imperial stone)	149 16 3
Harvey Bros. (Victoria stone)	141 0 0
Harvey Bros. (patent adamant stone)	141 0 0
Borough Surveyor (clinker flags)*	120 0 0
Imperial Stone Co. (imperial stone)	119 0 0
J. Ellis & Co., Ltd. (indurated stone)	117 15 0
F. Fowles (patent Alexandra stone)	116 15 0
Croft Granite, Brick, & Concrete Co., Ltd. (Croft adamant flags)	113 0 0
Harvey Bros. (2-in. shap stone)	105 15 0
H. J. Greenham‡	—
D. R. Paterson§	—

‡ No deposit. § No deposit.

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LONDON.—For making-up carriageway of Macmurdo-road, Fulham, for the Fulham Borough Council. Mr. F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.:—

Roadway.

D. R. Paterson‡	£573 19 2	J. Mears‡	£525 0 0
G. W. Wimpey & Co.	530 0 0	E. Parry & Co.	520 0 0
B. Nowell & Co.	525 0 0	H. J. Greenham‡	515 0 0
		F. Fowles*	495 0 0

Footways.

Imperial Stone Co., Ltd. (imperial stone)‡ ..	£111 0 0
Borough Surveyor (clinker flags)*	110 0 0
J. Ellis & Co. (indurated stone)	105 15 0
Croft Granite, Brick, & Concrete Co., Ltd. (Croft adamant flags)‡	99 0 0

‡ No deposit.

LONDON.—For conversion of ground floor and basement, No. 2, Highbury-place, into offices. Messrs. Wagstaff & Sons, architects, Highbury Corner, N.:—

Bellew			£563 0
Wontners			517 0
Roberts	Structural	£422 0	457 10
	Decorative	35 10	
Goodman	Structural	398 18	431 18
	Decorative	33 0	
Stuart*	Structural	399 0	429 0
	Decorative	30 0	

NESS (near Nunnington, Yorks.).—For a steel lattice girder bridge, 50-ft. span, over river Rye, at Ness, for the Kirbymoorside Rural District Council. Mr. J. E. Parker, C.E., Post Office-chambers, Newcastle-on-Tyne:—

S. Parsons & Co., Ltd., Horton Iron-works, Bradford £670

SUTTON COLDFIELD.—For erecting a new town hall and fire brigade station in King Edward-square, for the Corporation. Messrs. Mawston & Eddison, architects, 7, Great James-street, Bedford-row, London. Quantities by Mr. Max Clarke:—

T. Elvino, Naden-road, Soho-hill, Birmingham* £10,100

SUTTON COLDFIELD.—For new town hall, etc., Sutton Coldfield. Mr. W. A. H. Clarry, Borough Surveyor, Council House, Sutton Coldfield:—

Turville & Son	£13,050 0 0	J. Parnell & Sons	£11,044 0 0
F. L. Jones ..	12,326 0 0	W. Hopkins	11,000 0 0
A. N. Coles ..	12,250 0 0	T. Lowe & Sons	10,997 0 0
T. Rawbotham	11,875 0 0	Whitehouse & Sons	10,923 0 0
J. Barnsley & Son	11,798 0 0	J. E. Johnson & Co.	10,877 0 0
S. Bastow & Co.	11,726 0 0	Gowing & Ingram ..	10,874 0 0
Streather & Hill	11,610 0 0	J. Bowen & Son	10,797 0 0
Whittall & Sons	11,600 0 0	W. Moss & Sons	10,767 0 0
White & Sons	11,534 0 0	J. E. Moorhouse	10,755 0 0
W. Sapcote ..	11,387 0 0	W. H. Gibbs	10,650 0 0
H. Willcock & Co.	11,337 0 0	C. Wright ..	10,430 0 0
A. E. Goff ..	11,286 9 7	J. Dallow & Sons	10,380 0 0
R. Fenwick, Ltd.	11,255 0 0	I. Langley ..	10,227 0 0
T. Johnson ..	11,247 0 0	T. Elvins* ..	10,100 0 0
J. H. Vickers, Ltd.	11,099 0 0	E. Crowder ..	10,039 0 0
W. H. James	11,099 0 0		

TEIGNMOUTH.—For alterations and additions to the County Council School, Brook-street, for the Devon County Council. Messrs. J. W. Rowell, Sons, & Locke, architects, Newton Abbot. Quantities by Mr. Vincent Cattermole Brown, of Paignton:—

E. Andrews ..	£3,498 16 0	W. E. Blake ..	£2,870 0 0
H. Drew	3,150 0 0	F. C. Francis, Teignmouth*	2,840 0 0
Parker Bros. .	2,998 0 0	F. J. Badcock	2,769 11 10
J. J. Hayman	2,925 9 4		
G. Lee	2,900 0 0		

TEDDINGTON.—For erecting a free public library adjoining the Council offices, for the Urban District Council. Mr. H. A. Cheers, architect, 35, Waldegrave Park, Twickenham:—

Gregor & Son	£4,545	Wheatley & Sons	£3,860
Foster Bros.	4,269	F. G. Minter	3,796
J. Casse	4,256	Martin, Wells, & Co.	3,772
J. F. Collinson	4,100	Wisdom Bros.	3,750
Munday & Sons ..	4,043	A. Faulks	3,720
W. J. Maddison ..	4,027	D. W. Barker	3,606
W. J. Renshaw ..	3,989	W. J. Fryer & Co., Harrow-road, Paddington* ..	3,549
Gaze & Sons	3,957		
Lole & Lightfoot ..	3,934		
B. E. Nightingale	3,885		
Ferguson & Co. ..	3,866		

TREDEGAR (Mon.).—For extensions and alterations to Bedwellty Union Workhouse, for the Guardians. Messrs. James & Morgan, architects, Charles-street-chambers, Cardiff:—

J. Allen & Sons	£29,097 6 10
J. Lewis & Sons	28,916 19 3
W. Symonds & Co.	28,472 13 1
J. Linton & Co.	27,250 0 0
W. Watts	27,136 0 0
Lattey & Co., Ltd.	26,911 3 10
C. Jenkins & Son	26,787 0 0
W. Williams	26,649 0 0
J. Newcombe	26,274 3 9
W. E. Willis	25,157 0 0
D. Davies	24,743 0 0
E. R. Evans Bros.	23,778 0 0
D. W. Davies, Cardiff*	23,218 10 0
W. Williams & Son‡	—

‡ Not on proper form.

WALSALL.—For paving, etc., part of Charlotte-street and part of Dark-lane, for the Corporation. Mr. R. H. Middleton, Borough Surveyor:—

J. Atkins, Rycroft, Walsall £569

WALTHAMSTOW.—For alterations and additions to the Leyton, Walthamstow, and Wanstead Children's and General Hospital, Orford-road, for the Governors. Mr. J. Williams Dunford, architect, 100c, Queen Victoria-street, E.C.:—

Fuller & Son	£296 0 0	Sands, Palmer, & Co.	£255 0 0
J. & J. Dean	294 0 0	G. M. Page* ..	223 10 0
J. Reed	267 0 0		

[All of Walthamstow.]

WELLINGBOROUGH.—For alterations and repairs to farm buildings, Irthlingborough Grange, for the Urban District Council. Mr. J. E. H. De Key, architect, Wellingborough:—

F. Henson, Finedon, Wellingborough .. £112

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